Canadian Environmental Assessment Agency | Agence canadienne d'évaluation environnementale

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May 8, 2019

Sent by E-mail

James Millard
Manager Environment and Permitting
Atlantic Gold Corporation
jmillard@atlanticgoldcorporation.com

Dear Mr. Millard:

SUBJECT: Beaver Dam Mine Project – Round 2, Part 1 Information Requirements

In August 2017, the Canadian Environmental Assessment Agency sent Information Requirements (IRs) to Atlantic Gold Corporation following a technical review of the Environmental Impact Statement (EIS) of the Beaver Dam Mine Project by the Agency, other federal government experts, Indigenous groups, and the public. Atlantic Gold's responses to the IRs were received on February 28, 2019 in the form of a revised EIS.

The Agency has completed its technical review of the revised EIS for the proposed Project and determined that additional information is required, as per the attached (IR Round 2, Part 1). The Agency has not yet received comments from all participating Indigenous groups and will be submitting additional IRs (Round 2, Part 2) in the coming weeks.

With the issuance of these IRs, the federal timeline within which the Minister of Environment and Climate Change's decision must be made is paused as of May 8, 2019. The Agency requires acceptable responses to the IRs to complete its review and proceed with the preparation of its Environmental Assessment Report. Once you have submitted responses to all IRs, the Agency will take a period of up to 15 days without the timeline resuming to evaluate if the information provided is complete. If the Agency determines the responses to be complete, it will commence a technical review of the additional information and the timeline for the environmental assessment will resume the following day. If the responses are determined to be incomplete, you will be notified at that time. If the Agency has not come to a conclusion after 15 days, the timelines will resume the next day. For further information, please consult the Agency document *Information Requests and Timelines*.

The responses to IRs may be in a format of your choice; however, the format must be such that the responses to individual IRs can be easily identified. You may wish to discuss certain IRs with the Agency,

Indigenous groups or other government experts, as necessary, to obtain clarification or additional information, prior to submission of the responses as this can help to ensure that IRs are responded to adequately.

The IRs and your responses will be made public on the Canadian Environmental Assessment Registry's Beaver Dam Mine Project Internet Site:
https://www.ceaa-acee.gc.ca/050/evaluations/proj/80111?culture=en-CA

Please confirm receipt of this message and contact me if you require further information.

Sincerely,

Nicole Scotney
Project Manager
Canadian Environmental Assessment Agency

Attachment (1) – Beaver Dam Mine Project – Round II Information Requirements

Cc: Susanne Wade, Environment and Climate Change Canada
Michael Hingston, Environment and Climate Change Canada
Allison Denning, Health Canada
Chris Burbidge, Fisheries and Oceans
Shelley Ball, Natural Resources Canada
Bridget Tutty, Nova Scotia Environment

Attachment 1
Beaver Dam Mine Project
Round II Information Requirements from Environmental Impact Statement Review
May 8, 2019

INTRODUCTION

In August 2017 the Canadian Environmental Assessment Agency (the Agency) sent 51 information requirements (IRs) to Atlantic Gold Corporation (the proponent) based on the technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Beaver Dam Mine Project. The proponent submitted responses to the IRs in the form of a revised EIS on February 28, 2019. The Agency, other federal government experts and Indigenous groups have reviewed the IR responses and the Agency has prepared additional IRs, as elaborated in this document.

ACRONYMS AND SHORT FORMS

Agency	Canadian Environmental Assessment Agency
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
COPC	contaminant of potential concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EEMP	Environmental Effects Monitoring Plan
EIS	Environmental Impact Statement
ESFW	Eastern Shore Forest Watch Association
GCDWQ	*Guidelines for Canadian Drinking Water Quality*
HHRA	human health risk assessment
km	kilometre
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
LAA	Local Assessment Area
m	metre
MPOI	maximum point of impingement
NRCan	Natural Resources Canada
NSDNR	Nova Scotia Department of Natural Resources
NSE	Nova Scotia Environment
RAA	Regional Assessment Area
SAR	Species at Risk
SARA	Species at Risk Act
SOCI	Species of Conservation Interest
TSP	total suspended particulates
TSS	total suspended solids
VC	valued component

Reference IR#	Expert Dept.	EIS Guideline Reference	EIS Reference	Context and Rationale	The Proponent is Required to …
Project Overview					
CEAA-2-01	CEAA, Indigenous groups	5 (1)(c)(iii) Current Use of Lands and Resources for Traditional Purposes 5 (1)(c)(ii) Aboriginal Physical and Cultural Heritage 5 (1)(c)(iv) Any Structure, Site or Thing of Historical, Archaeological, Paleontological or Architectural Significance	Section 2, Project Description Section 6.14 Indigenous People	During consultation, Indigenous groups requested a visual representation of the Project that would clearly show landscape changes throughout all phases. The revised EIS states that the project area and its vicinity are used intensively by the Mi'kmaq of Nova Scotia.[1] In the revised EIS, the proponent provided discussion and topographic mapping outlining the visual impacts of the Project (all phases) from three positions (in a canoe in Lower Beaver Lake at 0.8 m height; standing on a rooftop; and at 5 m above ground) in or near Beaver Dam IR 17. However, the proponent has not provided a virtual representation or model that provides Indigenous groups or the Agency with an understanding of the visual impacts of the Project. The required virtual representation or model should be 2D or 3D and, based on the significant current and traditional use in the project area, employ additional viewpoints beyond Beaver Dam IR 17. The rationale of viewpoint selection is to be provided.	Provide a 2D or 3D model or virtual representation of the project area (before construction, and during operation, decommissioning and post-reclamation) to facilitate a clearer understanding of the visual impact of the Project. Viewpoints of the model or representation should be based on nearest residences and proximal areas of close land users. Provide a rationale as to why these viewpoints were selected and how they adequately depict landscape change over time during all phases of the Project.
Environmental Assessment Methodology					
CEAA 2-02	All	Part 2, Section 6.6 Significance of Residual Effects	Section 5.10 Residual Effects and Determination of Significance	The revised EIS provides an updated and improved methodology for the environmental assessment. However, as required in CEAA 1-11, CEAA 1-14 and CEAA 1-17, the EIS does not present adequate definitions of valued component-specific criteria and it does not provide sufficient rationale within significance conclusions for direct and cumulative effects.	Expand upon the revised valued component-specific criteria within the individual effects assessment chapters of the EIS, with a focus on quantitative definitions, specifically for magnitude and timing. If a quantitative criterion is not possible, provide a rationale as to why quantitative definitions are not appropriate.

[1] Revised EIS, p752.

				The significance determination criteria in Table 5.10-1 have been more clearly defined (e.g. magnitude, duration, timing, etc.) and describe the criteria rankings (e.g. low, medium, high). Where possible, quantitative information should be used (specifically for magnitude and timing). This information and clarity will allow reviewers to better follow and understand the proponent's assessment of individual valued components and the subsequent significance conclusions. The determination of significance for each valued component, (specifically noise, air, wetlands, fish and fish habitat, and Indigenous peoples) should be presented in a rational, defensible way that discusses the key criteria and provides a rationale if a particular criterion is deemed not relevant. The proponent may consider a decision tree or matrix which describes the combination of factors (magnitude, reversibility, frequency, duration, etc.) that would produce a significant effect. Furthermore, several of the valued components (e.g. noise, air, wetlands, fish and fish habitat, Indigenous peoples, etc.) throughout the EIS exceed thresholds and provide limited justification in concluding non-significance, or have an outcome of many maximum criteria rankings, and provide limited justification in concluding non-significance. For example, in the assessment of wetlands in section 6.8.9, the proponent concludes that effects will be high in magnitude, permanent and irreversible. The proponent offers little justification for the conclusions of non-significance. Additionally, in section 6.1, the predicted residual environmental effects of Project development and production on noise are assessed as adverse, but not significant. However, Table 6.1-9 notes that there is an exceedance of guidelines/threshold at the property lines. They extend beyond the PA, they extend beyond 3 years and they occur regularly during operations. A defensible rationale is required to justify the non-significance conclusion. The same comments apply for the cumulative effects assessments provided in section 8.	Provide an expanded analysis to support each significance determination in the direct and cumulative effects assessments (specifically noise, air, wetlands, fish and fish habitat, and Indigenous peoples) so that the reviewer understands how the conclusions were made in the revised EIS.

CEAA 2-03	CEAA, KMKNO	Section 6.1.4; 6.2.2	Section 6.6.6.3 Appendix F.6	In order to provide reviewers with a comprehensive understanding of what is being proposed, the proponent is required to compile a list of all mitigation, monitoring and follow-up programs related to the Project.	Provide a summary table or document of all proposed mitigation measure, monitoring and follow-up programs.
Light					
CEAA 2-04	CEAA	Part 2, Section 6.6 Significance of Residual Effects	Section 6.3.5.2 Thresholds for Determination of Significance	In the revised EIS, the proponent states that a significant impact for light is defined as "direct light trespass that according to the affected resident regularly interferes with the use and enjoyment of nearby residential properties on a permanent basis and/or evidence of unacceptable levels of bird mortality associated with Project lighting". In accordance with the EIS Guidelines and the Agency's Reference Guide: *Determining Whether a Project Is Likely to Cause Significant Adverse Environmental Effects*, the definitions of significance and the criteria used to determine a significant effect must be quantifiable, to the extent possible, for each VC.	Provide a quantitative definition of significance for light that can be used for the purpose of the environmental assessment. If this is not feasible, provide a reasoned rationale for the proposed definition of significance for light.
CEAA 2-05	CEAA, KMKNO, ESFW, Save Caribou	Part 2, Section 6.6.10 Aboriginal Peoples	Map Book - Figure 6.3-2 Light Impact Analysis	The revised EIS indicates that there is significant use of the Beaver Dam Mine site and its vicinity. Throughout consultation, Indigenous groups have expressed concern regarding light: specifically, how it may impact upon current use practices or may result in disturbance to wildlife, including species utilized by Mi'kmaq hunters. The revised EIS states that "the lighting effects from Beaver Dam would have a lower impact although it could be more widely experienced, especially if moisture or particulate matter are present in the atmosphere. The resulting halo of light above the mine might be seen from many locations." The Agency understands that Figure 6.3-2 provided in response to CEAA 1-43 does not represent the extent to which project light can be seen. For the Agency and Indigenous groups to understand potential effects from light, a better understanding of the extent of light effects is required. Furthermore, in consideration of the Haul Road, the proponent indicated that trucking will occur "mainly under daytime and pre-curfew conditions and thus light impacts from trucks along the Haul Road are expected to be insignificant when compared to	Provide a light shed map in consideration of Beaver Dam IR 17 and areas identified for current use practices. The model should use a conservative value in estimating moisture or particulate matter in the atmosphere. Provide additional consideration of potential fauna behaviour and distribution effects in relation to project lighting – specifically on species utilized by Mi'kmaq hunters. Indicate how predicted changes to fauna behavior/distribution may affect local hunting practices in the project area and its vicinity. Confirm whether lighting will be installed along the Haul Roads. Update the direct and cumulative effects assessment of related valued components as appropriate.

				baseline daylight illuminance and screening provided by trees along the Road". However, the proponent does not provide sufficient information on how Haul Road or mine operations may affect wildlife or specify how species utilized by Mi'kmaq hunters may be affected. Lastly, Table 6.11-6 states that "Project infrastructure and roads will have lights which are operational at all times." Clarification is required because it is the Agency's understanding that lighting will not be installed along the Haul Roads.	
Fish and Fish Habitat					
CEAA 2-06	DFO, KMKNO	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.9.3.1 Fish Habitat Assessment, Table 6.9-4; 6.9.6.2 Fish and Fish Habitat Impact Extent, Table 6.9-27	Section 6.3.1 of the EIS Guidelines requires "the identification of any potential harmful alteration, disruption or destruction of fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas". The information is necessary for the Agency to properly understand potential effects to fish and fish habitat. Section 6.9.6.2 of the revised EIS does not provide an estimate of the surface area of all potential fish habitat alteration and destruction likely to result from the Project. Although Table 6.9-27 provides affected watercourse length, it does not provide an estimate of the total affected area. Section 6.9.6.2.2 of the revised EIS describes indirect impacts to fish and fish habitat within the Beaver Dam Mine site; however, Table 6.9-27 does not provide an estimate of the surface area of indirect impacts to fish habitat that are likely to result from the Project (e.g., substantial changes in hydrology to the section of WC-5 downstream of the waste rock storage site, as well as Crusher Lake, Mud Lake and associated wetlands). Table 6.8-1 indicates that the total size of Wetland-17 surrounding Mud Lake has not been calculated; however, the hydrological alterations upstream of this wetland are likely to result in a harmful alteration. The area of potential alteration and disruption should be provided. Table 6.9-4 describes fish habitat present within each wetland and its associated watercourse in the Beaver Dam Mine site. All wetlands are identified as fish habitat. Table 6.9-27 is not	Provide an estimate of the surface area (in square metres) of the potential serious harm to fish (i.e., destruction and permanent alteration of fish habitat) that may result from the Project for each affected waterbody, watercourse and wetland. The proponent should assume any waterbody, watercourse or wetland that has been identified as potential fish habitat, but not confirmed, is fish habitat for the purposes of the estimate. Update Tables 6.9-4 and 6.9-27, as appropriate, indicating which wetlands, or portions of wetlands, are considered to be fish habitat. Provide a detailed rationale for any waterbodies, watercourses or wetlands that are characterized as having a low potential to be fish habitat along with supporting technical and scientific information.

				consistent with Table 6.9-4 because it indicates that a number of wetlands listed in Table 6.9-4 have low potential to be fish habitat. A detailed rationale for the low potential characterization has not been provided. In reference to Table 6.9-37 of the revised EIS, the proponent indicates that impacts to fish habitat will be quantified and confirmed through monitoring to determine if serious harm to fish is likely. Section 8.5.6.2.3.1 of the revised EIS indicates that there is uncertainty as to Project effects on fish and fish habitat. The proposed approach to reduce this uncertainty is to implement monitoring programs and follow-up programs. Impacts to fish and fish habitat must be characterized and quantified during the environmental assessment so that appropriate avoidance, mitigation and offsetting measures, as well as follow-up monitoring programs, are considered during the environmental assessment.	
CEAA 2-07	DFO, KMKNO	6.5 Mitigation; 6.6 Significance of Residual Effects	6.9.5.2 Thresholds for Determination of Significance; 6.9.9 Residual Effects and Significance	Section 6.9.5.2 of the revised EIS defines a significant adverse effect from the Project on fish and fish habitat as “an effect that is likely to cause serious harm to fish … an adverse effect that does cause a permanent loss to fish habitat may be mitigated by replacement of lost habitat and removal/rescue of fish present prior to commencement of the activity. This may also allow for an adverse effect to be considered not significant”. Section 35 of the *Fisheries Act* prohibits *serious harm to fish* which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. Project infrastructure and/or activities that result in the direct destruction of fish habitat are considered serious harm to fish. Substantial alterations to hydrological conditions in fish habitats over the long term that limit or diminish the ability of fish to use these habitats to carry out life processes are also considered to be serious harm to fish. DFO does not agree with the proponent’s prediction that direct and indirect impacts to fish and fish habitat from the Project will not result in serious harm to fish. Based on the information presented in the revised EIS, DFO has determined that the Project	Following the application of additional measures to avoid and mitigate impacts to fish and fish habitat (see DFO IR-3), provide an estimate of the total surface area of residual serious harm to fish (in square metres) that is likely to result from the Project. This estimate must include fish habitats that will be directly destroyed by Project components, and fish habitats that will be permanently altered as a result of hydrological alterations from Project components. Provide a draft fish habitat offsetting plan that identifies specific measures that will be implemented to offset the likely residual serious harm to fish from the Project. The draft fish habitat offsetting plan should be developed in accordance with available guidance: *DFO’s Fisheries Productivity Investment Policy: A Proponent’s Guide to Offsetting* (http://www.dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/index-eng.html). Note that a final fish habitat offsetting plan and associated letter of credit is required to apply for a *Fisheries Act Authorization*. Update the direct and cumulative effects assessment of related valued components as appropriate.

				is likely to result in serious harm to fish and that a *Fisheries Act Authorization* is required. Based on the significance threshold for fish and fish habitat provided in section 6.9.5.2 of the revised EIS, additional information is needed about fish habitat offsetting measures to determine whether the Project is likely to result in a significant adverse effect to fish and fish habitat. The Agency requires that the proponent demonstrate that measures and standards have been fully applied to first avoid, then mitigate, residual harm to fish, as set out in DFO's Fisheries Protection Policy Statement (http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html#ch84).	
CEAA 2-08	DFO, KMKNO	Part 2, Section 2.2 Alternative Means of Carrying out the Project; Part 2, Section 6.5 Mitigation	Section 6.9.6.2 Fish and Fish Habitat Impact Extent	Part 2, Section 2.2 of the EIS Guidelines requires the proponent to identify and consider the effects of alternative means of carrying out the Project that are technically and economically feasible. Part 2, Section 6.5 of the EIS Guidelines requires the proponent to identify technically and economically feasible mitigation measures for each environmental effect identified. As set out in DFO's *Fisheries Protection Policy Statement* (http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html#ch84), proponents are required to demonstrate that measures and standards have been fully applied to first avoid, then mitigate, residual serious harm to fish before DFO will consider offsetting measures. Page 488 of the revised EIS states that there are "opportunities to further redesign the project to avoid/minimize the impacts" to fish and fish habitat. Table 6.9-36 on page 509 of the revised EIS includes a commitment from the proponent to "Maintain pre-construction hydrological flows into and out of down-stream surface water habitats, to the extent practicable, to limit indirect impacts to fish habitat." Section 6.9.6.2 of the revised EIS describes a large area of residual serious harm to fish at the Beaver Dam Mine site from the Project. It is important to understand what technically and economically feasible measures may be available to avoid and mitigate impacts to fish and fish habitat from project infrastructure and activities, including opportunities to redesign the Project, as well as the potential environmental effects of any project redesign on fish and	Provide a description of any technically and economically feasible opportunities to redesign the Project in a manner that would avoid and mitigate impacts to fish and fish habitat. Provide a description of any additional technically and economically feasible measures that could be implemented to mitigate impacts to fish and fish habitat, including any site-specific measures that can be implemented to maintain pre-construction hydrological flows into and out of downstream surface water habitats. Indicate whether the proponent intends to implement any of the project redesigns and/or mitigation measures. Update the direct and cumulative effects assessment of related valued components as appropriate.

				fish habitat and other valued components. The Agency requires the proponent to identify opportunities to further avoid and mitigate serious harm to fish. DFO will then evaluate the adequacy of the offsetting measures proposed in the preliminary fish habitat offsetting plan.	
CEAA 2-09	DFO, KMKNO	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.7.3.3 Surface Water Quantity; Section 6.9.6.2 Fish and Fish Habitat Impact Extent	As indicated in section 6.7.5.5 of the revised EIS, the Mud Lake catchment area will be altered during site development. These alterations will affect runoff volume discharging into Mud Lake on an annual basis. The results of the surface water quantity modelling described in section 6.7.6.1.2 indicate that the Mud Lake catchment area will be reduced by approximately 43%. Furthermore, the catchment area of Crusher Lake will be reduced by 52%. Crusher Lake and Mud Lake are directly connected by Watercourse-5 (WC-5), which is the sole watercourse in the Beaver Dam Mine site that drains directly into Mud Lake. Flow rates within WC-5 are expected to decrease. The presumed reduction of flow is predicted to impact upon the ecological maintenance flow within WC-5. Mud Lake is a shallow body of water with a depth not exceeding approximately 2 m to 3 m and is bordered by Wetland-17. During certain months of the year, Mud Lake experiences natural reductions in water volume due to warmer temperatures and low-flow periods. The reduction in the catchment area is expected to further reduce the volume of water in Mud Lake. Mud Lake, WC-5 and Wetland-17 all provide fish habitat. These habitats may be used for overwintering, rearing, feeding, refuge and passage, and are directly connected to Cameron Flowage (Killag River) via the outflow of Mud Lake. Section 6.9.6.2.2 of the revised EIS indicates that mine infrastructure will directly affect the drainage area of Mud Lake and several watercourses that eventually empty into Mud Lake. DFO requires additional information regarding the Project's potential to result in the permanent alteration of fish habitat in Mud Lake and Wetland-17.	Provide a description of how the reduction of water in Mud Lake will affect fish habitat in Mud Lake and the adjacent Wetland-17. The description should include, but is not limited to additional information on whether: • The quality or type of fish habitat in Mud Lake will be altered by predicted changes in water volume or changes in lake characteristics associated with water quantity (e.g., water temperature, dissolved oxygen, nutrient concentrations). • The availability or type of fish habitat in Wetland-17 will be altered by the predicted changes in water quantity in Mud Lake or the potential changes in the environmental characteristics of Mud Lake. • A vertical drop in water levels will exacerbate Mud Lake's sensitivity to thermal stress during summer months. • Provide rationale for the conclusion provided in Table 6.9-37 that refers to the determination that the residual effects to Mud Lake will not be significant. Update the direct and cumulative effects assessment of related valued components as appropriate.

CEAA 2-10	DFO	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.7.6.1.2 Surface Water Quantity Modelling Results; Section 6.9.6.2 Fish and Fish Habitat Impact Extent	As indicated in section 6.7.6.1.2 of the revised EIS, the catchment area to Crusher Lake is expected to be reduced by approximately 52%. Crusher Lake is bordered by Wetland-8 and Wetland-10, which are lacustrine wetlands that are permanently saturated. As referred to on page 408 of the revised EIS, runoff that would naturally flow through WC-5 from Crusher Lake will be diverted to Cameron Flowage (Killag River) via the north settling pond. Water levels in Crusher Lake are expected to experience less fluctuation than normal. The reduced water levels in Crusher Lake may impact upon WC-5 by reducing the flow below the ecological maintenance level. Flows in WC-5 may experience a reduction of approximately 43%. WC-5 flows through multiple wetlands, including Wetland-8, Wetland-14 and Wetland-17. WC-5 also has connectivity to other watercourses (e.g. WC-3) and wetlands (e.g. Wetland-20) north of Crusher Lake. The development of the waste rock stockpiles and low-grade ore stockpiles within the contributing area to Crusher Lake is expected to directly reduce the overall size of the drainage area and directly affect several watercourses that empty into Crusher Lake. As indicated on page 495 of the revised EIS, Crusher Lake is approximately 4 hectares in area and is known to support a variety of fish species.	Provide rationale to support the determination on page 339, which informs Table 6.7-24, that reductions in flow into and out of Crusher Lake will result in minor changes (i.e. not significant) to fish and fish habitat. Provide additional information regarding the fish habitat in WC-5 and whether the reduction of Crusher Lake's catchment area may result in the permanent alteration of fish habitat present in Crusher Lake and WC-5 (e.g. alteration of habitat used for passage). Provide additional information and rationale to explain why any permanent alterations to Crusher Lake and WC-5 from the reduction of flow, reduction of Crusher Lake catchment area, diversion of runoff, development of mine infrastructure, etc. will not result in subsequent permanent alterations to watercourses or wetland habitat connected to WC-5 and Crusher Lake. Update the direct and cumulative effects assessment of related valued components as appropriate.
CEAA 2-11	DFO	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.9.6.2 Fish and Fish Habitat Impact Extent	Part 2, section 6.3.1 of the EIS Guidelines requires estimates of fish mortality for various species and life stage (e.g. egg, larvae, juvenile, adult). Page 492, section 6.9.6.2 of the revised EIS states: "Mortality to fish is expected to be low, once mitigation measures are implemented including fish rescue of adult fish prior to commencement of construction activities in confirmed fish habitat and adherence to approved timing windows for construction to minimize impact to eggs, larvae, and juvenile fish." Fish rescue activities vary in effectiveness depending on how they are carried out. The revised EIS does not provide information on planned fish rescue (i.e. collection or release sites; fish handling, transport and release methods). The Agency therefore cannot	Provide a description of planned fish rescue measures. For example, detail capture, handling, transport, release methods, capture and release locations and timing. Predict the effectiveness of the planned fish rescue, including an estimate of fish mortality for various species and life stages from the Project in the event that fish rescue is ineffective or that an introduction and transfer licence cannot be obtained.

				assess the potential effectiveness of this proposed mitigation. Additionally, the planned movement of live aquatic organisms is regulated by DFO through the *National Code on Introductions and Transfers of Aquatic Organisms* under the *Fishery (General) Regulations* to ensure that environmental impacts of planned movements are limited. An introduction and transfer licence may be required for fish rescue activities. DFO evaluates the ecological and genetic risks of planned transfers and determines whether a licence can be issued.	
CEAA 2-12	DFO	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.9.6.2 Fish and Fish Habitat Impact Extent, Table 6.9-27	Section 6.9.6.2 of the revised EIS describes potential effects to fish from blasting activities near watercourses, including death, injury and behavioural disturbance. Section 2.3.2.1 indicates that blasting will occur two or three times a week at the open pit. The eastern border of the open pit is located approximately 100 m or less from Cameron Flowage. The revised EIS does not provide a detailed analysis or assessment of the potential magnitude and extent of death, injury or behavioural disturbance to fish in Cameron Flowage that could result from blasting in the open pit. Table 6.9-36 of the revised EIS includes a commitment to follow DFO's measures to avoid causing harm to fish and fish habitat pertaining to blasting. These measures include avoiding the use of ammonium nitrate-based explosives in or near water due to the production of toxic by-products. However, section 2.4.2.2 of the revised EIS states that the construction and operation phases will use ammonium nitrate as a blasting agent. The Agency is unclear as to whether the proponent intends to implement DFO's measures to avoid causing harm to fish and fish habitat pertaining to blasting.	Clarify which of DFO's measures to avoid causing harm to fish and fish habitat pertaining to blasting are applicable to the Project and which measures the proponent intends to follow. Provide a detailed analysis and assessment of the potential magnitude and spatial extent of death, injury and behavioural disturbance to fish in Cameron Flowage that could result from blasting activities in the open pit, along with supporting scientific and technical information. Update section 6.9.6.2 of the revised EIS as appropriate.
CEAA 2-13	DFO. KMKNO, ESFW	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 2.3.3.2 Conceptual Reclamation Plan, page 59; Section 6.9.6.2 Fish and Fish Habitat Impact Extent	The Killag River provides habitat for all life stages of salmonids, including the Southern Upland population of Atlantic salmon. This population has been designated by COSEWIC as Endangered and is currently under consideration for listing under Schedule 1 of SARA. The Killag River has been identified as important habitat for all life stages of Atlantic salmon in the West River Sheet Harbour system. The river also provides habitat for American eel which is	Provide an assessment of the potential effects of suspended sediment released into Cameron Flowage from the open pit post-mine closure on fish and fish habitat within the Killag River. Update the direct and cumulative effects assessment of related valued components as appropriate.

				designated by COSEWIC as Threatened and is currently under consideration for listing under SARA. Section 6.3.1 of the EIS Guidelines requires "the identification of any potential harmful alteration, disruption or destruction of fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas." Section 2.3.3.2 of the revised EIS states that during decommissioning, the pit will be filled with water, creating a lake, with the re-establishment of a connection between the filled open pit and Cameron Flowage. The release of suspended sediment into Cameron Flowage is a potential harmful alteration, disruption or destruction of fish habitat. Elevated levels of suspended sediments can harm fish and sedimentation can damage or destroy spawning habitat, bury and smother eggs, and affect survival and emergence. Additional information is needed to determine whether suspended sediments released into Cameron Flowage from the open pit post-mine closure will adversely affect fish and fish habitat in the Killag River.	
CEAA 2-14	DFO, KMKNO, ESFW	Part 2, Section 6.3.1 Fish and Fish Habitat	Section 6.9.6.2 Fish and Fish Habitat Impact Extent; Section 6.6.6 Project Activities and Groundwater Quality and Quantity Interactions and Effects	The Beaver Dam Mine site is located immediately adjacent to the Killag River, the main tributary to West River Sheet Harbour, which provides important habitat for all life stages of salmonids, including Southern Upland Atlantic salmon. Given the current status of Southern Upland Atlantic salmon and the importance of the Killag River to the survival and recovery of this species in the West River Sheet Harbour system, adverse effects from the Project on salmon habitat extending beyond the project area into the Killag River have potential to be significant. As such, the Agency requires the proponent to provide a thorough assessment of potential effects and to take all measures to avoid and mitigate adverse effects to fish and fish habitat within the Killag River. Groundwater inflow in rivers and streams serves an important function in sustaining aquatic ecosystems and salmonid habitat by providing stable water temperatures year-round and augmenting stream flows during periods of low flow. For these reasons, fish	Provide an assessment, with supporting scientific and technical information, of the potential effects of reductions in groundwater inflows on fish and fish habitat within the Killag River, including the potential effects to salmonid habitat. Update the direct and cumulative effects assessment of related valued components as appropriate. Provide the specific location in the revised EIS (e.g. document title, page number) where additional information about the simulated change in base flow throughout the Cameron Flowage watershed has been presented. Provide the specific location in the revised EIS where the predicted reduction in base flows to Cameron Flowage are discussed in section 6.7.

				often seek areas of groundwater upwelling for spawning and egg incubation, overwintering, and refuge from warm water during summer. Section 6.6.6.1 of the revised EIS predicts base-flow reductions to Cameron Flowage and the Killag River and states that "Effects will range from locally significant to insignificant. No adverse groundwater impacts from the Beaver Dam Mine Site are predicted beyond the boundary of the RAA, and in general, the majority of impacts do no extend beyond the LAA." Page 246 of the revised EIS states that the simulated change in base flow throughout the Cameron Flowage watershed is presented in Table 7.4 of Appendix F.1 (Beaver Dam Model Report); however, there is no Table 7.4 in Appendix F.1 and there is no report titled Beaver Dam Model Report in the list of Appendices. Page 246 of the revised EIS also states that further analysis of the potential effects of this base-flow reduction to Cameron Flowage is discussed in Section 6.7 (Surface Water Section); however, it is not clear where there is a discussion of the potential effects of this base-flow reduction in Section 6.7. Section 6.9.6.2.2, page 497 of the revised EIS states that "There is a predicted increase in runoff volume discharged to the Killag River of 0.91% and 0.03% during EOM and PC, respectively. Additionally, a 5 to 7% reduction in baseflow is predicted for the Killag River (Appendix G.5). Together, the impact to fish and fish habitat within the Killag River was deemed negligible." The revised EIS does not include a detailed assessment of the potential effects of the reduction in base flows to fish habitat due to changes in groundwater, nor does it include an explanation of how the impacts to fish and fish habitat were deemed negligible. The Agency is of the view that impacts to salmonid habitat in the Killag River have potential to be a significant adverse environmental effect. Additional information is needed to understand the potential effects of groundwater reductions on fish and fish habitat within the Killag River.	

CEAA 2-15	DFO	Part 6, Section 6.7.1 Effects of Potential Accidents or Malfunctions	Section 6.18.3.2 Stockpile Slope Failure, Table 6.18-3 Fish and Fish Habitat	Section 6.7.1 of the EIS Guidelines states: "The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present a preliminary emergency measures." Section 6.18.3.2 of the revised EIS indicates that a "Worst-case scenario resulting from stockpile slope failure would be disturbance to surrounding area, including the potential for mine rock and low-grade ore to enter nearby watercourses, damage to infrastructure, and worker safety." Table 6.18-3 also states that the potential for adverse effects to fish and fish habitat is low, although the worst-case scenario of the disturbance of a watercourse or waterbody from a stockpile slope failure has not been carried forward into the Potential Interactions and Effects section of 6.18.3.2. It is unclear why the worst-case scenario of mine rock and low-grade ore entering a nearby watercourse has been excluded from the definition of a significant event. The Agency requires a reasoned explanation as to why it has also been excluded from Table 6.18-3 and the Potential Interactions and Effects section. Given the proximity of soil and till stockpiles to Cameron Flowage and the Killag River, a slope failure of mine rock, low-grade ore, and/or soil stockpiles could potentially result in materials entering this watercourse. Due to the importance of Cameron Flowage and the Killag River to salmonid species, principally the Southern Upland population of Atlantic salmon, any such disturbance could result in significant adverse effects to fish and fish habitat as defined in section 6.9.5.2 of the revised EIS.	Provide an effects assessment for potential stockpile slope failure on fish and fish habitat given the importance of fish habitat within and adjacent to the project area, after mitigation has been applied.
CEAA 2-16	DFO	Part 6, Section 6.7.1 Effects of Potential Accidents or Malfunctions	Section 6.18.3.3 Settling Pond Failure, Table 6.18-4 Fish and Fish Habitat	Section 6.7.1 of the EIS Guidelines states: "The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present a preliminary emergency measures." The Agency notes that in section 6.18.3.3 of the revised EIS, a worst-case scenario "would be complete failure of the settling pond, resulting in uncontrolled discharge of sediment laden water into the surrounding environment." The revised EIS further states that "Should a settling pond failure result in an uncontrolled	Provide a detailed assessment of the potential effects of siltation and increased total suspended solids (TSS) on fish and fish habitat from a settling pond failure with reference to relevant and recent scientific literature. Provide clarification on monitoring versus evacuation procedures. The proponent indicates that in the event of a storm event which creates volumes in excess of the capacity of the settling ponds or infrastructure failure, the spillway into the water diversion structure will be used for

				discharge of sediment laden water to Cameron Flowage the event will be considered significant" and that the potential for adverse effects to fish and fish habitat is high (Table 6.18-4). The Agency also notes that in section 6.18.3.3, Potential Interactions and Effects, "Inadequate settling pond capacity and water level monitoring, combined with a significant precipitation event may cause a settling pond failure and thus, pose a risk to surface water quality, wetlands, fish and fish habitat, and SOCI/SAR through all phases of the Project." Furthermore, in section 6.18.3.3, Mitigation and Emergency Response, the statement is made: "In the event of a 1 in 100 year precipitation event that creates volumes in excess of the capacity available in ponds and ditching, or infrastructure failure, a spillway into the water diversion structure will be used for overflow. In the case of a storm event or infrastructure failure, settling ponds will be monitored regularly … Generally, settling pond failure emergency response includes raising the alarm and evacuation of all equipment and personnel from the area." Given the potential effects to Southern Upland Atlantic salmon in the Killag River, further assessment of a settling pond failure is warranted. The potential effects of a settling pond failure and the impacts of sediment-laden water on fish and fish habitat are not fully discussed.	overflow and the settling ponds will be monitored regularly. In the event of settling pond failure, emergency response plans indicate that all personnel will be evacuated from the area. Portions of these mitigation and emergency response plans contradict one another and do not give a sense of confidence in mitigation procedures (i.e. the commitment to monitor and evacuate simultaneously). Clarify the capacity of the settling pond. It is inferred in the revised EIS that in the event of a 1 in 100-year storm, the settling pond will reach capacity and over flow into the spillway. The capacity of the spillway is unclear. Clarify whether the spillway is capable of negating potential effects to Cameron Flowage (i.e. sediment-laden water entering fish habitat) in the event of a settling pond failure or overflow. Confirm the total volume (i.e. 1 in 100-year, 1 in 200-year storm events) that the entire system can hold prior to release into Cameron Flowage. Given the effects of climate change and the potential for high volume rain events to occur more frequently than in the past, and the potential effects on fish and fish habitat in the Killag River should a failure occur, provide additional information about settling pond design considerations. Conduct an effects assessment on residual effects in the event of a settling pond failure after mitigation measures have been implemented, and provide a significance determination. Update the direct and cumulative effects assessment of related valued components as appropriate.

CEAA 2-17	DFO	Part 6, Section 6.7.1 Effects of Potential Accidents or Malfunctions	Section 6.18.4.2 Fuel Spills, Table 6.18-6 Fish and Fish Habitat	Section 6.7.1 of the EIS Guidelines requires the proponent to "conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present preliminary emergency measures". Section 6.18.4.2 of the revised EIS states that a "Worst-case scenario would be a transportation collision causing the entire amount of material being transported to be spilled into a water body. The effects of the spill would vary depending on the material spilled; diesel fuel and gasoline are toxic to aquatic life and would have the greatest impact to the environment." Table 6.18-6 also states that the potential for adverse effects to fish and fish habitat is high. The effects of a fuel spill scenario in which fuel either from a vehicle accident or fuel delivery truck accident entering a waterbody has not been sufficiently assessed. There is potential for this scenario to occur along the Haul Road and thus impact watercourses which provide habitat for salmonids, principally Southern Upland Atlantic salmon in West River Sheet Harbour. Given the potential effects to fish and fish habitat, the Agency requires further assessment of potential fuel spills.	Conduct an assessment on the effects of hydrocarbon spills on fish and fish habitat. Assess the potential for a large fuel spill to enter the West River system and disperse to the Eastern Shore Islands Area of Interest. Investigate impacts to fish and fish habitat within this Area of Interest. Update the direct and cumulative effects assessment of related valued components as appropriate. Based on the updated assessment, provide mitigation measures that will mitigate adverse effects to fish and fish habitat.
CEAA 2-18	DFO	Part 6, Section 6.7.1 Effects of Potential Accidents or Malfunctions	Section 6.18.6 Risk Assessment, Table 6.18-12	Section 6.7.1 of the EIS Guidelines requires the proponent to "conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present a preliminary emergency measures". Section 6.18.6 of the revised EIS provides an overview of the risk assessment process in which the proponent assigned a risk rating to each potential accident or malfunction. The section describes the definition of each likelihood of occurrence, as well as the magnitude ratings for accidents and malfunctions. It is unclear how the proponent assigned these values to each accident and malfunction scenario. Given the fact that the proponent uses these risk ratings to determine significance, the Agency requires a rationale for each value.	Provide evidence and/or explanation as to how the proponent concluded the likelihood of each accident or malfunction. It is unclear how values were assigned to likelihood of occurrence or probability for each accident and malfunction. Provide the same level of evidence and/or explanation for how the proponent reached magnitude ratings for each accident or malfunction. Provide further evidence or rationale, citing peer-reviewed literature, as to why each accident or malfunction is not considered significant, even if the qualitative risk rating is low or moderate for fish and fish habitat, particularly Southern Upland Atlantic salmon in the Killag River.

CEAA 2-19	DFO	Part 6, Section 6.1.6 Effects Assessment: Fish and Fish Habitat	Section 6.9 Fish and Fish Habitat; 6.9.2 Baseline Program Methodology; 6.9.3 Baseline Conditions; Tables 6.9-2, 6.9-3 and 6.9-4	Section 6.1.6 of the EIS Guidelines requires that the proponent include the following in the EIS: "a description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos". Section 6.9.2 of the revised EIS provides an overview of the baseline program methodology, with section 6.9.3 indicating baseline habitat results. However, the proponent has not provided detailed results as prescribed in the EIS Guidelines. These results would aid in verifying fish habitat found in each watercourse, as well as confirm fish habitat descriptions/classifications given to each watercourse in Tables 6.9-3 and 6.9-4.	Provide a description of the habitat by homogeneous section as described in section 6.1.6 of the EIS Guidelines.
CEAA 2-20	DFO	Part 6, Section 6.1.6 Effects Assessment: Fish and Fish Habitat	Section 6.9 Fish and Fish Habitat; 6.9.6 Project Activities and Fish and Fish Habitat Interactions and Effects; Table 6.9-28, Figures 6.7-3A - 6.7-3L	Section 6.9.6.2 of the revised EIS gives an overview of potential direct and indirect impacts within the Haul Road project area. Widening and re-alignment within the Haul Road to support upgrades for the Project will be required. Table 6.9-28 provides an overview of the potential or confirmed impact to fish habitat (m^2) within wetlands along the Haul Road. Figures 6.7-3A to 6.7-3L visually depict potential impacts to fish habitat within streams and wetlands along the Haul Road. It is unclear how the proponent calculated the potential/confirmed impact to fish (m^2) in Table 6.9-28. Figures 6.7-3A-6.7-3L show differing areas of wetlands affected around the Haul Road. Some wetlands are only impacted directly within the Haul Road footprint, while others have an equal buffer of impact north and south of the road, and some have an irregular buffering of impact around the road.	Clarify the procedures utilized to calculate impacts to fish habitat (m^2) in wetlands along the Haul Road. Explain why affected wetland areas in Figures 6.7-3A to 6.7-3L are not consistent on either side of the Haul Road for each wetland.
CEAA 2-21	DFO, KMKNO, ESFW, Save Caribou	Part 6, Section 6.1.6 Effects Assessment: Fish and Fish Habitat	Section 6.9 Fish and Fish Habitat; 6.9.7 Preferred Alternative Haul Road; Table 6.9-32; Figure 6.8-1	Section 6.9.7 of the revised EIS provides an effects assessment of the newly added Preferred Alternative Haul Road route. Construction of the Preferred Haul Road section will require the alteration of wetlands which provide habitat for fish. Table 6.9-32 gives an overview of the fish habitat within wetlands along the Preferred Alternative Haul Road. Figure 6.8-1 visually depicts watercourses and wetlands along the Preferred Alternative Haul Road.	Calculate impacts to fish habitat (m^2) in wetlands along the Preferred Alternative Haul Road and indicate the methods for their calculations; maintain consistency with section 6.9.6. Update Figure 6.8-1 to include potential impacts to fish habitat.

				It does not appear that the proponent calculated the potential/confirmed impact to fish (m^2) within wetlands from the Preferred Alternative Haul Road. Figure 6.9-32 also fails to show areas of wetlands affected around the Preferred Alternative Haul Road.	
CEAA 2-22	DFO	Part 6, Section 6.1.6 Effects Assessment: Fish and Fish Habitat	Section 6.9 Fish and Fish Habitat; 6.9.7.3.2 Preferred Alternative Haul Road - Electrofishing; Table 6.9-33	Section 6.9.7.3.2 of the revised EIS provides an overview of the contiguity between watercourses within the Preferred Alternative Haul Road route and electrofishing results from the original Haul Road surveys. Table 6.9-33 provides an overview of the contiguity between the Preferred Alternative Haul Road watercourses and original Haul Road watercourses. The description of the contiguity between the two routes as described in Table 6.9-33 and the text below are not consistent.	Clarify if the text or table is correct with respect to contiguity and make the appropriate corrections to ensure consistency throughout the revised EIS. Base any conclusions on these correlations.
CEAA 2-23	DFO, KMKNO, ESFW	Part 2, 6.3.1 Fish and Fish Habitat	Table 6.9-37 Residual Environmental Effects for Fish and Fish Habitat on page 511; Biological Monitoring Studies ii in Appendix O.1	In reference to Table 6.9-37, the proponent indicates that impacts to fish habitat will be quantified and confirmed through monitoring to determine if serious harm to fish is likely. The preliminary Environmental Effects Monitoring Plan (EEMP) was prepared to outline the proposed monitoring to support the Project. Section 8.5.6.2.3.1, indicates that there is some uncertainty as to Project effects on fish and fish habitat. The proposed approach to reduce this uncertainty is to implement monitoring programs and follow-up programs. It is critical to accurately characterize and quantify the impacts to fish and fish habitat prior to the issue of an Environmental Assessment approval so that the appropriate avoidance, mitigation, monitoring and counterbalancing measures are included as terms and conditions of the approval. DFO cannot provide an accurate determination of the area of serious harm to fish if the proponent has yet to characterize and quantify the impacts of the Project on fish and fish habitat. If monitoring is required to accurately assess the potential impacts to fish and fish habitat, monitoring should be undertaken prior to the Environmental Assessment.	Provide a rationale as to why no monitoring approaches for fish and fish habitat have been provided in the preliminary EEMP.

Migratory Birds, Fauna and Species of Concern					
CEAA 2-24	ECCC	Section 6.1.5; Section 6.1.7; Section 6.1.8; Section 6.2; Section 6.3.2; Section 6.3.3; Section 6.4; Section 6.5; Section 8	Section 6.10, 6.12, 6.13; Section 8.5; Section 9.2	*Wetland Habitat for Migratory Landbird Species At Risk (SAR)* The Project as proposed will result in the loss of wetland function (i.e. habitat for landbird SAR). For those wetlands that cannot be avoided and for those where direct and indirect effects cannot be entirely minimized, conservation allowances should be considered as a compensation. However, it is unclear whether the proponent's proposed wetland compensation would include conservation allowances for affected habitat for wetland function loss (landbird SAR). *Bank Swallow* While it was not detected during surveys of the project area, bank swallow is another migratory bird SAR, which nests in Nova Scotia and may be attracted to un-vegetated stockpiles of soil with faces at 70 – 90° slopes during the months of May to July. *Greater Yellowlegs* The Project as proposed will result in the loss of breeding habitat for greater yellowlegs, and may cause disturbance to migratory birds in areas where habitat is not directly affected by the Project. Pairs establishing territories, nesting birds and chick-rearing birds shall not be disturbed, as per the *Migratory Birds Convention Act*. For this reason, ECCC generally recommends a minimum setback of 300 m from greater yellowlegs from mid-April until chicks have naturally left the area.	Provide details on the conservation allowance for loss of wetland function (habitat for landbird SAR) that will be implemented. Provide details on a landbird SAR monitoring program that would be implemented that includes adaptive management measures to be implemented in the event that unanticipated effects are detected. Confirm that measures similar to those proposed for common nighthawk will also be implemented for bank swallows due to potential attraction to the project area as a result of project-related changes in habitat. Provide details on the measures that will be implemented to avoid effects of habitat loss of greater yellowlegs. Clarify whether buffers would be established if greater yellowlegs nest near, but not within, the project footprint.
CEAA 2-25	ECCC	Section 5.0; Section 6.1.1; Section 6.1.10; Section 6.2.1; Section 6.5; Section 8.0	Section 6.2.6.2; Appendix C-1, Figure 5	The revised EIS (page 165) notes the potential of PM_{10} criteria being exceeded up to 57% of the time. Even given the conservative estimate of a background concentration, this is still a high frequency in an area with demonstrated Indigenous land and resource issues. The scale of Figure 5 in Appendix C and the limited description of the extent of the exceedances found on page 161 of the revised EIS make it difficult to identify any interactions between the higher ambient concentrations in the vicinity of the Haul Road and the identified sensitive receptors.	Provide a more detailed description of the geographical extent of any ambient air quality exceedances and their interaction with any potential sites important for use by Indigenous people.

CEAA 2-26	ECCC	Section 6.10 Section 6.13	Section 6.10, 6.13; Section 8.5; Section 9.2	*Boreal Felt Lichen* A proposed boreal felt lichen critical habitat polygon may be present in the path of the Preferred Alternative Haul Road, but this is not clear in the revised EIS. Critical habitat includes any occurrence documented between 2005 and 2015, even if individuals are thought to be lost. Young boreal felt lichen are difficult to see, and it is therefore important to leave potential habitat where it is known that the building blocks of these lichens for critical habitat. In the *Amended Recovery Strategy for the boreal felt lichen (Erioderma pedicellatum), Atlantic population, in Canada (Proposed)*, critical habitat for boreal felt lichen is identified as: • the substrata/porophyte for growth of boreal felt lichen (i.e. the host tree); • the wetland in which the substrate/porophyte occurs, or is adjacent to; and • a critical function zone around the substrate/porophyte (500 m radius) and associated wetland (100 m radius if <100 m^2; 50 m radius if >100 m^2). The critical function zone is necessary to maintain the hydrology of the wetland, microhabitat characteristics required for the survival of the lichen, and to allow for colonization. *Blue Felt Lichen* Blue felt lichen was observed at 30 locations: Haul Road (1), Beaver Dam Mine site (14), broader LSA (10), adjacent to the Haul Road (3), Preferred Alternative Haul Road (2). Micro-siting of project infrastructure (minus the Preferred Alternative Haul Road) has reduced the number of individuals of blue felt lichen directly affected by the Project from 3 to 1. Micro-siting has not yet been done for the Preferred Alternative Haul Road, and while the proponent expects to avoid priority lichens, this has yet to be confirmed, thus two individuals may be directly affected. Blue felt lichen individuals not directly affected by the Project may be indirectly affected by changes in air quality, or changes in hydrology of the site.	Provide shapefiles for the entire project footprint (i.e. including the Preferred Alternative Haul Road) and Local Assessment Area (LAA) so that the Project can be mapped in relation to boreal felt lichen critical habitat polygons. ECCC can provide the boreal felt lichen proposed map package to the proponent upon request, with the expectation that a copy of the mapped project in relation to the critical habitat polygons would subsequently be provided to ECCC. If there is an overlap, demonstrate how measures have been taken to avoid, minimize or mitigate effects to boreal felt lichen. Provide details regarding the technical feasibility of transplantation of directly affected blue felt lichen as a proposed mitigation. Confirm that a 100 m habitat buffer would be maintained for all individuals of blue felt lichens and frosted glass whiskers that would not be directly affected by the Project. For any individuals where a 100 m habitat buffer would not be implemented, identify measures to avoid/minimize the effects. Provide a lichen species at risk (SAR) monitoring program that would include all sites where lichen SAR have been detected in the Local Assessment Area. Explain how adaptive management measures would be proposed and implemented in a timely manner in the event that adverse effects to lichen SAR are detected. Provide details on the conservation allowance for the loss of wetland function (habitat for hibernating snapping turtles) that will be implemented. Update the direct and cumulative effects assessment of related valued components as appropriate.

				Frosted Glass Whiskers Lichen Frosted glass whiskers were detected at eight locations at the Beaver Dam Mine site, and micro-siting has resulted in avoidance of all eight locations. Three individuals were identified along the Preferred Alternative Haul Road, but do not fall directly within the road alignment. Frosted glass whiskers not directly affected by the project may be indirectly affected by changes in air quality, or changes in the hydrology of the site. The proponent proposes to reduce effects to frosted glass whiskers by maintaining a 100 m habitat buffer wherever practicable. *Snapping Turtle* The Project will result in the loss of wetland habitat suitable for hibernating snapping turtle.	
Air, Noise and Human Health					
CEAA 2-27	CEAA, KMKNO, ESFW, Save Caribou	Section 6.7.3 Cumulative Effects Assessment	Section 8.5 Cumulative Effects Assessment of the Valued Components	Section 8 of the revised EIS does not contain a cumulative effects assessment for noise. The proponent states that residual adverse effects from noise will remain after the application of mitigations. Residual effects of other past, present and reasonably foreseeable projects noted in the revised EIS have the potential to interact with the residual effects of the Beaver Dam Mine Project, both spatially and temporally (Table 8.4-4). Specifically, the proposed Beaver Dam Mine, Fifteen Mile Stream Gold and Cochrane Hill Gold Projects will be operating concurrently and using the same Haul Roads to transport ore to the existing Touquoy Mine and Facility for final processing. The proponent's rationale for not carrying noise into the cumulative effects assessment is that the residual effects from noise are anticipated to revert back to baseline conditions upon completion of the Project. The Agency notes that noise levels were close to or exceeded thresholds during the assessment of direct Project effects. As such, the Agency requires that noise be carried forward into the cumulative effects assessment.	Provide a cumulative effects assessment for noise, including the reasonably foreseeable projects: Fifteen Mile Stream Gold and Cochrane Hill Gold Projects. Provide a worst-case scenario for noise along the Haul Road in consideration of Beaver Dam, Fifteen Mile Stream Gold, and Cochrane Hill Gold Projects and forestry operations. Update the direct and cumulative effects assessment of related valued components as appropriate and include additional mitigation to reflect this scenario.

				In addition to Fifteen Mile Stream Gold and Cochrane Hill Gold Projects, the proponent has identified forestry operations as an ongoing project in the area. Although sporadic, the proponent indicated that there is a potential for cumulative effects between forestry and the other mining projects, and stated that an overlap of these projects will likely occur.	
CEAA 2-28	CEAA, KMKNO, ESFW, Save Caribou	Section 6.7.3 Cumulative Effects Assessment	Section 8.5 Cumulative Effects Assessment of the Valued Components	A cumulative effects assessment for air is included in section 8.5 of the revised EIS. The proponent identified projects that are certain or reasonably foreseeable that would operate concurrently with the Beaver Dam Mine Project, and use the same Haul Roads. The Agency notes that the air dispersion model of the Haul Road (presented in C-1 and within the revised EIS) does not account for Fifteen Mile Stream and Cochrane Hill Gold Projects. Some air quality levels were close to or exceeded thresholds during the assessment of direct Project effects. As such, the Agency requires that air dispersion modelling be completed to characterize potential cumulative effects. In addition to Fifteen Mile Stream Gold and Cochrane Hill Gold Projects, the proponent has stated: "it is likely that forestry operations will occasionally coincide with those of the Beaver Dam Mine and cause greater disturbance to air quality than these operations produce individually, especially along the Haul Road. However, such additive periods are likely to be limited in duration and frequency and are not expected to be significant." The proponent has stated that during active periods, forestry-related traffic results in approximately 100 trucks per day. The Agency requires that the proponent provide a worst-case scenario for air quality in consideration of forestry, Fifteen Mile Stream Gold and Cochrane Hill Gold Projects.	Provide modelling to support the cumulative effects assessment for air quality, including the reasonably foreseeable projects: Fifteen Mile Stream Gold and Cochrane Hill Gold Projects. Provide a worst-case scenario for air quality along the Haul Road in consideration of Beaver Dam, Fifteen Mile Stream Gold and Cochrane Hill Gold Projects and forestry operations. Update the cumulative effects assessment as required, including providing additional mitigation. Update the direct and cumulative effects assessment of related valued components as appropriate.
CEAA 2-29	HC	Section 6.1.1 Atmospheric Environment	Section 6.2.6, p238; Section 6.2.9, p242; Table 6.2-12, p238; Table 6.2-15, p242	In Table 6.2-12, the maximum cumulative (i.e. baseline + project) concentrations of TSP, PM_{10} and $PM_{2.5}$ (annual average) are predicted to exceed the relevant air quality criteria in the Haul Road operations scenario. Consequently, at one of the sensitive receptor locations (i.e. Deepwood Estates), the maximum cumulative concentrations of TSP and PM_{10} would exceed the criteria and $PM_{2.5}$ would reach 95% of the criteria (Table 6.2-15).	Provide additional justification to support the conclusion and related significance determination on the $PM_{2.5}$ health effects. This could include measures to reduce uncertainty and increase confidence in the predictions and/or to further mitigate effects.

				However, the proponent states that these elevated contaminant levels are "likely to be overestimated … due to conservatism related to the lack of local background data (as well as conservatism inherent in the dispersion modelling)" (p238). The proponent also concludes that "[t]here is a great deal of uncertainty in the presented background concentrations for both TSP and PM_{10}, which reduces the proposed significance of these findings. The overall significance of these exceedances is therefore also assessed as 'not significant'" (EIS Section 6.2.9, p242). Although cumulative effects ***may be*** overestimated due to conservative approaches employed (e.g. use of the maximum measured 24-hour TSP background concentration instead of 90^{th} percentile value) to compensate for insufficient background data, the conservative approaches are not sufficient to conclude that the adverse effect is not significant. As such, the assessment with respect to air quality is inconclusive given the lack of background data, and, as such, determination of significance cannot be conclusively defined for $PM_{2.5}$.	
CEAA 2-30	HC	Section 4.1 Guidance; Section 3.2 Factors to be Considered	Section 6.1.9, p223 Appendix B.1 - Section 2.0 Methodology	The EIS states that during construction "noise will be elevated above baseline for limited periods but for a short duration (12-24 months)". According to Section 6.3.1 of Health Canada (2016), construction noise lasting longer than one year should be assessed as operational noise. The methods to evaluate operational noise are also presented in Health Canada (2016). *Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE*. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.	Provide a quantitative evaluation of construction noise as operational noise using the approach described in Health Canada (2016) given the expected duration of the construction phase (up to 2 years).
CEAA 2-31	HC	Section 3.2.2 Operation; 6.1.1 Atmospheric Environment; 6.2 Predicted Changes to the Physical Environment; 6.3.4 Aboriginal Peoples	Section 6.1.6, p214; 6.1.7.3, p218; Table 6.14-1, p808 Figure 2.1-2 Appendix B.1 Figures 3 and 4	The locations of the nearest human receptors that were evaluated in the air and noise assessments are not clear. Several seasonal and permanent dwelling locations appear on the maps provided; however, it is not clear if all relevant receptors were identified. For example, the locations of traditional land use were not identified. Where traditional land use is practiced closer to the project site than the permanent/seasonal dwellings, these areas should also be evaluated for potential health impacts.	Provide all human receptor locations, including locations of traditional land use and recreational use which may be closer to the project area than seasonal and/or permanent dwellings (for both air quality and noise VCs) on maps and in summary tables. Update the noise and air modelling and human health assessment as required.

			Appendix B.1 Section 6.1 Section 6.1.3.2, p211 Appendix B.1 - Section 6.2 Section 6.2.6.4, p235	*Noise* Given that the Nova Scotia (NSE) Noise Guidelines are intended not only for dwellings but also for recreational areas, any area used for recreational or traditional purposes by Indigenous peoples located closer to the project site should be included in the noise assessment. This is particularly relevant because of the predicted exceedances of the provincial noise guidelines at the Beaver Dam Mine site property boundary. In terms of noise, section 6.1 of Appendix B.1 states that "the Nova Scotia Guidelines for Environmental Noise Measurement and Assessment state that their guideline limit values are intended to be applied where people normally live, work, or take part in recreation". According to section 6.1.7.3 of the EIS, "activities in the project site area include recreational use (hunting, ATVs, etc)". According to Table 6.14-1, "Mi'kmaq families also enjoy camps in the area for recreational purposes." Additionally, the EIS states that "the highest predicted noise levels at the property boundaries of the Beaver Dam Mine Site exceed the criteria NSE Pit and Quarry Guidelines (1999) for all time periods … . While the limits stated in these guidelines are clear and specific, they are not considered practical to meet for open pit mines with operations located close to property lines." However, according to section 6.2 of Appendix B, The NSEL document *Pit and Quarry Guidelines, May 1999* specifies the following sound level limits at the property boundaries of pits and quarries. *Air Quality* In terms of air quality, it appears that the predicted air pollutant concentrations were screened against air quality criteria at the "sensitive receptor" locations throughout the EIS (e.g. Table 6.2-12). However, it is not clear what these sensitive receptors represent and how they are selected and located. In the vicinity of the Beaver Dam and Touquoy Mine sites and Haul Road operations area, Indigenous traditional land users may be exposed to higher concentrations of airborne contaminants than those at the identified 'sensitive receptor' locations. The proponent should screen and assess the exposure to air	Provide further justification for the conclusion that the noise limits in the *NSE Pit and Quarry Guidelines* (1999) are not valid at the property boundary of the Beaver Dam Mine Site. Provide additional mitigation measures that reduce noise at the property boundary given the predicted exceedances. Update any monitoring or follow up programs at the property boundary to verify predicted noise levels and evaluate the level of conservatism used in the modelling. Provide the predicted exposure levels to air pollutants at the maximum point of impingement (MPOI). Assess the health risks from air pollutants using the revised exposure levels at the MPOI. Illustrate the predicted air and noise isopleths for the regional study area, in graphic/map format with all the human receptor locations identified above.

				contaminants at the maximum point of impingement (MPOI) in addition to at the nearest permanent and seasonal dwellings.	
CEAA 2-32	HC	Section 6.1.1 Atmospheric Environment	Section 2.3.2.2, p127 Section 6.1.8, p219	Section 6.1.8 states that "traffic on the Haul Road will generally be restricted to 16 hours per day during the operational phase. This will minimize noise along the Haul Road during evening hours." Section 2.3.2.2 states that approximately 20 trucks will be operating between 0600-2300 hours (which is a time span of 17 hours) to transport ore from the Beaver Dam Mine site to the Touquoy Mine site. It is unclear whether an increased duration will have an impact on noise levels along the Haul Road during the evening hours (which according to the *Nova Scotia Guidelines for Environmental Noise Measurement and Assessment* is between 1900 and 2300 hours). In the event future noise levels are elevated, a formalized complaint-response plan should be implemented and additional mitigation may also be necessary.	Confirm that the truck traffic for the noise assessment has been adjusted to reflect 16 hours rather than 12 hours. If noise levels are likely to be elevated during the evening/overnight period, provide a discussion of any additional mitigation measures that may be employed to reduce noise levels at the nearest receptor locations. Develop a complaint-response plan which would be implemented in the event of public complaints associated with increased noise levels during project construction and/or operation.
CEAA 2-33	HC	6.1.1 Atmospheric Environment	Section 6.2, p229 Section 6.2.4.4, pp238 and 239	The proponent considered particle deposition as the sole operable pathway for air contaminants and assessed the health effects of only particulate matter (PM), such as total suspended particulate (TSP), $PM_{2.5}$ and PM_{10}. The EIS states that "gaseous compounds were screened out during the preliminary air quality assessment (Appendix C.1), only particulate concentrations were carried forward for the air quality impact assessment". However, it is unclear why other important criteria air contaminants, such as NO_2 and SO_2, were screened out and not carried forward to the impact assessment. Also, although the annual average $PM_{2.5}$ concentration is predicted to exceed the Canadian Ambient Air Quality Standards (CAAQS) at the maximum point of impingement (MPOI) in the Haul Road operations scenario, the effect is considered *not-significant* as the exceedances are predicted to occur less than 2% of the time. The CAAQS for $PM_{2.5}$ explicitly recognize the absence of health effects thresholds by having additional management levels at concentrations below the CAAQS, which reflect the health and	Provide an additional explanation as to why the inhalation of gaseous compounds, such as NO_2 and SO_2, were screened out of further assessment in terms of human health. Provide a qualitative or quantitative HHRA for $PM_{2.5}$ in relation to exposure throughout the study area with particular attention to $PM_{2.5}$ concentrations along the Haul Road in close proximity to seasonal/permanent residences and traditional land use areas. Provide a discussion of the implications of the CAAQS-associated management levels and the potential to reduce emissions.

				environmental benefits that can be achieved by taking actions to reduce air pollution to background levels. The proponent mentions that health risks exist below the air quality criteria; however, the risk levels are stated to "be within acceptable ranges" without discussing the possible mitigation measures to prevent air quality deterioration compared to background levels.	
CEAA 2-34	HC	Section 6.1.4 Groundwater and Surface Water	Section 6.6.3.1, p297	The discussion of regional domestic well supplies is not sufficient to identify potential receptors of project-related contaminants. It is unclear whether the "nearest domestic well" referenced is at the intersection of Hwy 224 and the Haul Road or elsewhere. The results presented in Tables 6.6-1 and 6.6-2 are not discussed and it is not clear how the results represent regional baseline groundwater quality.	Provide a map showing the documented domestic drilled and dug wells within the project area/zone of influence. For example, clarify where the wells from Tables 6.6-1 and 6.6-2 are located. Indicate when the samples in Tables 6.6-1 and 6.6-2 were taken and discuss the results in terms of existing contaminants of potential concern (COPC) levels.
CEAA 2-35	HC	Section 4.1 Guidance	Section 1.3 Federal, p83 6.6.5.4, p316 6.7.5.1, p378 6.7.5.5, p385 6.14.6 Surface Water and Groundwater, p837 6.14.6 Surface Water and Groundwater, pp836 and 837 Table ES-1, Reference IR Number NSE-1-2, p13	The conclusions on the significance of adverse effects on groundwater and surface water quality are subsequently used to determine the significance of indirect effects on human health. However, there is no comparison of predicted results to the *Guidelines for Canadian Drinking Water Quality* (GCDWQ). According to Nova Scotia Environment (NSE, 2014), "in situations where surface water is used as a drinking water source or where there is believed to be a high potential for incidental ingestion of surface water, the [GCDWQ] are recommended for use." There are several statements of impacts to surface water being "limited"; however there is no discussion of whether any parameters were predicted to be above GCDWQ. Also, surface water is omitted as a direct exposure pathway (i.e., contact and ingestion/drinking during traditional land use activities) with no justification. The proponent states that "there is the possibility for seasonal dwellings to be drawing water from the lakes; however, there is no record of this". The GCDWQ have more stringent antimony and uranium limits than the NSE Tier 1 and/or CCME guidelines. The GCDWQ also provide limits for nitrate and nitrite which are absent from the NSE guidelines. The site specific water quality objective derived for	Compare predicted surface and/or groundwater concentrations to the GCDWQ if there are drinking water supplies (surface or groundwater) affected by project activities. Include nitrate in Table 6.7-15 or further justify its exclusion. Provide a justification as to why average contaminant concentrations in groundwater discharges to surface water were used to evaluate potential health risks from the consumption of surface and/or groundwater that may be impacted by mining activities.

			Table ES-1, Reference IR Number NSE-1-54, p22 6.16.3.2, p874 6.3.4 Aboriginal Peoples 6.5 Mitigation	arsenic did not consider effects to human health and is higher than the GCDWQ limit which is "based on treatment achievability; elevated levels associated with certain groundwater issues; levels should be kept as low as reasonably achievable". The groundwater assessment appears to have used "average" predicted concentrations for groundwater discharges to surface water. Using maximum predicted concentrations is a more conservative assessment of potential health risks from consumption of surface water under the influence of groundwater in the event that either is a potable drinking water supply. *References:* *Guidelines for Canadian Drinking Water Quality* - Summary Table. 2017. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. February. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html *NSE Environmental Quality Standards (EQS) for Contaminated Sites Rationale and Guidance document*. April 2014.	
CEAA 2-36	HC	Section 6.2 Predicted Changes to the Physical Environment	Section 6.6.6.2, p321 2.3.1.2, p113 6.6.8, p330	Potential effects to groundwater quality as a result of the application of magnesium chloride during operations are characterized simply as "highly localized" and "limited in extent". Given that aggregate materials for construction of the Haul Road may be "sourced from either the Touquoy or Beaver Dam Mine Sites", a discussion is warranted on the use of tested, "clean" material. This is particularly important given the presence of potentially elevated levels of specific metals in the aggregate materials that may be used to construct the Haul Road.	Specify whether the application of magnesium chloride or other dust suppressants on the Haul Road (or elsewhere depending on usage) or use of aggregate materials for road construction may impact domestic drinking water supplies such that the GCDWQ may be exceeded in nearby wells (including frequency and magnitude of any effects). If impacts are predicted, provide a follow up plan that includes baseline sampling of nearby drinking water wells.

CEAA 2-37	HC	Section 3.3.1 Changes to the Environment	Section 6.7.3.1.2, p351 Figures 6.7-3l, 6.7-12 Section 6.7.6.2, p396	The water flow and fish passage discussion in the revised EIS is limited to the effects of Haul Road activities. However, receptors downstream of water crossings have the potential to be exposed to project related contaminants, including in the event of a spill, through recreational use or drinking water. It is also unclear whether residents along Ferry Lake are located upstream or downstream of the Haul Road.	Assess the potential effects of Haul Road activities on water quality downstream of the watercourse crossings. Clarify whether human receptors who may live or use Ferry Lake (or any other locations downstream of any water crossings) may be affected due to project-related contaminants, including accidental chemical spills and the possible contamination of downstream drinking water supplies. If there is the potential for this to occur, update the assessment of related valued component as appropriate.
CEAA 2-38	HC	Section 6.3.4 Aboriginal Peoples	Section 6.14.5, p828 Section 6.14.6 Surface Water and Groundwater, p836 Example from 6.14.6 Geology, Soil and Sediment, p835	The EIS dismisses indirect effects on human health from each exposure pathway independently from all other pathways. For example: “No residual effects for geology, soils and sediment are anticipated … . Therefore, no indirect significant effects are expected as a result of the link between biophysical effects and effects to Indigenous peoples.” A human health risk assessment (HHRA) is required when elevated COPC concentrations are predicted in one or more environmental media for a proposed project. The following elevated COPC concentrations are noted: Several contaminants are above criteria in air at receptors located further from the project than Indigenous traditional land users. • Aluminum and boron concentrations in soil along the Haul Road are predicted above criteria. • Concentrations of several parameters were predicted to be above criteria in the Beaver Dam and Touquoy pit lakes, and to a lesser extent the receiving watercourses. Note comment HC-10 regarding the use of site-specific water quality objectives for arsenic focused on effects to aquatic ecology and not on human health. • Concentrations of several parameters were predicted above criteria in berries along the Haul Road. Note comment HC-01 regarding the limited scope of the country foods assessment.	Provide justification as to why an HHRA is not required to determine significance on Indigenous people. OR Conduct a human health risk assessment (HHRA) to provide an estimate of potential human health risks associated with chemicals released at various stages of the proposed project. This should include but is not limited to Indigenous and recreational land users, seasonal residents and/or permanent residents.

				Given the documented traditional land use of the area, the predicted COPC concentrations above criteria in several media, and the Millbrook First Nation request for an independent study regarding impacts to human health, a quantitative HHRA should be undertaken. Where there are pathways that may not result in increased exposure to the human receptors identified, a qualitative (screening) approach may be sufficient. Further information on evaluating human health risks can be found in Health Canada's 2012 *Guidance on Preliminary Quantitative Risk Assessment (PQRA)*. *Reference:* Health Canada. 2012. *Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)*, Version 2.0.	
CEAA 2-39	HC	Section 6.6 Significance of Residual Effects	Section 6.14.5.2, p830	Health Canada assesses biophysical changes in air quality, noise levels, drinking water effects, and contamination of country foods (and those impacts on human health). Thresholds for the determination of significance on human health are defined as "effects on health … of affected Indigenous communities to the extent that there are *associated detectable and sustained decreases in the quality of life of a community*." The proposed significance definition does not provide a quantitative measure to evaluate potential human health effects from the project. Furthermore, there is no evaluation of quality of life in the EIS and as such, it is not possible to evaluate significance in relation to human health. For example, 'detectable' and 'sustained decreases' in the 'quality of life' of 'a community' cannot be determined during the environmental assessment process. Section 6.14.5.2 further states that *non-permanent and/or geographically limited (i.e., small-scale) changes in harvest areas caused by displacement due to Project activities are not considered to be significant***.** The Agency requires that terms such as "geographically limited (i.e. small scale)" or "changes in harvest areas" must be clearly defined.	Provide a quantitative definition of significance for human health that can be measured during the environmental assessment. If this is not feasible, provide a reasoned rationale for the proposed definition of significance for human health. Define the "geographically limited (i.e. small scale) changes in harvest areas" relative to the assessment study areas and confirm that the movement of species of interest for harvest through the study areas has been considered.

Hydrogeochemistry					
CEAA 2-40	NRCan	Part 2, Section 6 Effects Assessment; 6.1.3 Topography and Soil	Page 203-204, Section 6.5.3.2 Soils and Sediments Appendix C.2, Evaluation of Exposure Potential Related to Dust Deposition from Haul Road Traffic onto Soils, Berries, and Vegetation, Table 2-1 Appendix E.2, Beaver Dam Project – ML/ARD Assessment Report, Table 4-9	Section 6.5.3.2 provides a brief description of the surficial geology and geochemistry of soils and tills in the project area based on two reports from the Nova Scotia Department of Natural Resources summarizing exploration geochemistry data collected by NSDNR from 1977-1982 (3 samples; NSDNR 2006a) and by Seabright Resources from 1986-1989 (98 samples; NSDNR 2006). Additional soil sampling was completed along the proposed Haul Road in 2018 as discussed in Appendix C.2. Six overburden samples were also collected at the Beaver Dam Project Site for metal leaching/acid rock drainage (ML/ARD) testing, but are not discussed in section 6.5.3.2. It is NRCan's view that a systematic survey of surface soils at the Beaver Dam site would help to establish more reliable site-specific baseline concentrations for a broader range of metal(loid)s within the project area, and may also help to identify areas containing historical mine tailings. The spatial distribution of some elements of concern, especially arsenic, will most likely vary significantly across the site and be influenced by various factors such as proximity to the ore zone, glacial transport, and soil depth (see Parsons and Little (2015) for examples from other gold mines in Nova Scotia). A better understanding of soil geochemistry could help the proponent manage areas contaminated by historical mining activity, and select the most appropriate materials for future reclamation efforts. From 2007 to 2010, the NSDNR and Geological Survey of Canada collected samples of soil and till throughout Nova Scotia that could provide additional insight into the geochemistry of soils and dust along the proposed haul route (Rencz et al. 2011; Friske et al. 2014a, 2014b). These surveys sampled individual soil horizons, including the "Public Health" layer (0-5 cm) and would augment data for the 11 soil samples collected along the haul road in 2018 (Appendix C.2). Geochemical data from these surveys would also be useful for establishing background concentrations for a wide range of elements from other parts of the Meguma Supergroup with similar bedrock and surficial geology to the Beaver Dam site. Based on the results of these surveys, include discussion on the main processes that might control the spatial distribution of elements such as arsenic, which exceeds CCME soil quality	Conduct a survey of soil geochemistry at the Beaver Dam Mine site to delineate soils contaminated by former mining activity, including historical tailing.

				guidelines in 29 of 98 till samples near the project site (page 203, section 6.5.3.2) and in all of the overburden samples collected for ML/ARD testing (Appendix E.2, Table 4-9). These data would serve as a baseline for future environmental monitoring activities and help guide reclamation efforts. Soil geochemistry data are available from regional surveys carried out by the Geological Survey of Canada (GSC) and NSDNR from 2007-2010, and by the GSC around NS gold mine districts. These datasets could help the proponent to evaluate the ranges of arsenic (As) and Mercury (Hg) typically encountered around historical gold mine districts, and how their own soil geochemistry data compare to other parts of Nova Scotia. Incorporating these data into future environmental monitoring programs should help to distinguish mining impacts from natural variations in element concentrations within soils of the Meguma Terrane. Friske, P.W.B., Ford, K.L., McNeil, R.J., Pronk, A.G., Parkhill, M.A., and Goodwin, T.A. (2014a) *Soil Geochemical, Mineralogical, Radon and Gamma Ray Spectrometric Data from the 2007 North American Soil Geochemical Landscapes Project in New Brunswick, Nova Scotia and Prince Edward Island*; Geological Survey of Canada, Open File 6433 (revised). doi:10.4095/293020 Friske, P.W.B., Ford, K.L., McNeil, R.J., Amor, S.D., Goodwin, T.A., Groom, H.D., Matile, G.L.D., Campbell, J.E., and Weiss, J.A. (2014b) *Soil Geochemical, Radon and Gamma Ray Spectrometric Data from the 2008 and 2009 North American Soil Geochemical Landscapes Project Field Surveys*; Geological Survey of Canada, Open File 7334 (revised). doi:10.4095/293019 Parsons, M.B. and Little, M.E. (2015) *Establishing geochemical baselines in forest soils for environmental risk assessment at the Montague and Goldenville gold districts*, Nova Scotia, Canada; Atlantic Geology, v. 51, pp364–386. Rencz, A.N., Garrett, R.G., Kettles, I.M., Grunsky, E.C., and McNeil, R.J. (2011) *Using soil geochemical data to estimate the range of range of background element concentrations for ecological and human-health risk assessments*; Geological Survey of Canada, Current Research 2011-9, 22 p. doi:10.4095/288746	

CEAA 2-41	NRCan	Section 6.1.4; 6.2.2	Appendix F.5 Parts I-II (Hydrogeologic Model Development and Application)	*Dewatering scenario at Beaver Dam:* The simulation of the drawdowns caused by the dewatering activities was done using drains along the wall and at the bottom of the open pit. Figures 7.1a-b, 7.2a-b and 7.3a-b in Appendix F.5 show that resulting drawdowns close to the open pit will be in the order of 4 m. Given that the depth of the open pit will be up to 200 m, those drawdowns appear to be very low in comparison. The proponent should indicate whether a seepage face will be present along the pit walls. If a seepage face is present, as stated in the Appendix F.1 (Assessment of Potential Open Pit Groundwater Inflows – Beaver Dam Gold Project), seepage along the pit walls may induce instability of the walls and complete dewatering of the walls would be safer. In this scenario, adding pumping wells or horizontal drains along the perimeter of the pit may be necessary. As a consequence, more groundwater would be pumped out of the aquifer, which may result in more water to dispose of, more drawdowns, more impact on the baseflow, as well as a different solute transport time.	Provide a cross-section through the Beaver Dam open pit with drawdowns and hydraulic heads depicted as a figure to give a better perspective of the induced drawdowns. Indicate whether a seepage face will be present along the pit walls. If so, simulate seepage along the pit walls and reassess impacts accordingly, particularly for the Cameron Flowage.
CEAA 2-42	NRCan	Section 6.1.4; 6.2.2	Appendix F.5 Parts I-II (Hydrogeologic Model Development and Application) and Appendix F.6 (Groundwater Flow and Solute Transport Modelling to Evaluate Disposal of Beaver Dam Tailings in Touquoy Open Pit)	*Bedrock porosity at Beaver Dam and Touquoy:* Transport simulations were conducted to assess the potential of contamination of the mining activities on the quality of the surface water. In these simulations, the porosity values used for the bedrock (shallow and deep) appear to be in the higher range of possible values for the formations present. For instance, values of 10% and 5% for shallow and deep bedrock were used, respectively (the same values were used for the Beaver Dam and Touquoy sites). Given the very low hydraulic conductivity of the bedrock, in the range of 10^{-7} and 10^{-9} m/s, much lower values of porosity are expected. Using much lower porosity values will increase groundwater velocity, which in turn may have a larger impact on water quality.	Provide porosity measurements on cores to reduce the uncertainty on porosity values. Reassess transport simulations particularly for the Cameron Flowage and the Moose River.

CEAA 2-43	NRCan	Section 6.1.4; 6.2.2	Appendix F.6 (Groundwater Flow and Solute Transport Modelling to Evaluate Disposal of Beaver Dam Tailings in Touquoy Open Pit)	*Hydraulic conductivity of the mapped faults at Touquoy:* As indicated by the sensitivity analysis provided, the presence of mapped faults not characterized during hydrogeological field testing may have important negative impacts on the water quality of the Moose River and Watercourse-4.	Assess the potential for high hydraulic conductivity faults at Touquoy in the field. Based on the results, update the modeling, including calibrating the model with the faults, and the effects assessment, as required.
CEAA 2-44	NRCan	Section 6.1.4; 6.2.2	Appendix F.6 (Groundwater Flow and Solute Transport Modelling to Evaluate Disposal of Beaver Dam Tailings in Touquoy Open Pit)	*Baseflow calibration for Touquoy:* A baseflow value for the Moose River is estimated using the calibrated numerical model for the baseline conditions. However, there is no baseflow calibration to ensure that the estimated value with the model is correct. While the calibration with the hydraulic heads is satisfactory, this does not guarantee that the mass balance of the model is realistic. Without baseflow calibration, several combinations of hydraulic conductivity and groundwater recharge can match observed heads, but with each combination having a different impact on the baseflow estimates. Baseflow calibration should be done at least for the Moose River which is expected to be the most impacted by the Project.	Using a similar approach to Touquoy, estimate baseflow for the Moose River using recursive filter on streamflow records. Based on the results, update the modeling, including calibrating the model to Moose River baseflow, and the assessment of related valued component as appropriate.
CEAA 2-45	NRCan	Section 6.1.4; 6.2.2	Appendix F.6 (Groundwater Flow and Solute Transport Modelling to Evaluate Disposal of Beaver Dam Tailings in Touquoy Open Pit)	*Calibrated hydraulic conductivity values for streambed at Touquoy:* It is indicated that the hydraulic conductivity values for river streambeds (e.g., Moose River) were adjusted during the calibration. However, the calibrated values are not provided. For conservative simulations, NRCan recommends also using streambed hydraulic conductivity values higher or equal than the hosting material. Indeed, using lower K values will disconnect the rivers from the aquifer and thus diminishing the impact of dewatering activities.	Provide adjusted calibrated hydraulic conductivity streambed values for river streambeds at the Touquoy project site. Indicate how values compare with the hosting material.

CEAA 2-46	CEAA, KMKNO	Section 6.1.4; 6.2.2	Section 6.6.6.3 Appendix F.6	The proponent's solute transport model presented in Appendix F.6 indicates that contaminant concentrations would decrease by a factor of 1,000 over the 100 m distance between the tailings pit and the Moose River. However, even when the low permeability of the rock is considered, this rate of transport is unusually low. Kwilmu'kw Maw-klusuaqn Negotiation Office's consultant (CBCL Limited) completed scoping calculations using data from the report, and the results are not consistent with the presented model results.	Discuss the low rate of transport presented in Appendix F.6 and justify the results presented in the model.
Accidents and Malfunctions					
CEAA 2-47	CEAA, ECCC, KMKNO, ESFW	Section 6.7.1	Section 6.18	In accordance with the Operation Policy Statement: *Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012* and Technical Guidance: *Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012*, the Agency requires that mitigation and contingency planning are clearly outlined in the event of accidents and malfunctions. Comments received from Indigenous people expressed concern regarding the potential for fuel and other spills (e.g. cyanide) to affect land and resources in the project area, and to detract from Indigenous use of the area or lead to avoidance. In the revised EIS, Table 6.18-6 Fuel and/or Other Spills Interactions with VCs states that "fuel and/or spills could potentially adversely affect Indigenous peoples", either directly in relation to ground and surface water quality and/or indirectly due to potential adverse effects to fish, fish habitat, wetlands and terrestrial habitats and species, and that this potential for adverse effects is high. No analysis of potential fuel/spills on current use is provided in the revised EIS. Furthermore, the Risk Rating Matrix (i.e. Figure 6.18-1), utilized on page 861 of the revised EIS, is not a commonly used ranking system. The selected values for likelihood of occurrence and level of magnitude are unsupported. The resulting risk ratings appear to be unrealistic for the selected scenarios.	Provide an analysis of the effects of potential fuel or other spill events on current use of land and resources by Indigenous people, including the potential for a worst-case scenario event. Provide mitigation and contingency planning, with priority given to areas of high importance by Indigenous people and how these would be protected in the event of a spill. Justify or revise the Risk Rating Matrix to provide a more comprehensive assessment that utilizes a more up-to-date ranking method of the likelihood and magnitude of all plausible accidents and malfunctions.