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December 22, 2020

Colin Webster
Vice President, Sustainability and External Affairs
Brookfield Place, 181 Bay Street, Suite 3910
Toronto, ON M5J 2T3
CWebster@alamosgold.com

Dear Mr. Colin Webster:

SUBJECT: Technical Review of the Environmental Impact Statement for the Lynn Lake Gold Project – Information Request (IR) Round 1 Package 2

The Impact Assessment Agency of Canada (the Agency), with input from federal authorities, Indigenous groups, and the public, is continuing the technical review of the Environmental Impact Statement (EIS) for the Lynn Lake Gold Project (the Project) received from Alamos Gold Inc. on July 27, 2020.

Upon review of the EIS, the Agency, federal authorities, and Indigenous Groups identified gaps in the information provided. The information is necessary to determine whether the Project is likely to cause significant adverse environmental effects and to inform the Agency's preparation of the Environmental Assessment (EA) Report under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

The Agency sent Alamos Gold Inc. Round 1 Package 1 on October 28, 2020, and as per the accompanying letter, the Agency has prepared the attached IR Round 1 Package 2 to allow Alamos Gold Inc. to continue the gathering of essential information in a timely manner. The Agency will provide Alamos Gold Inc. with a third IR Round 1 package in January 2021. Should Alamos Gold Inc. reassess the responses provided to the Agency for Package 1 due to the issuance of Package 2 and 3, please provide any updated responses to the Agency as required.

When responding to IRs, the Agency requests that Alamos Gold Inc.:

- consider the context and rationale for the required information for every question;
- present thorough discussions of any areas of uncertainty, applying a precautionary approach, given that some studies and plans may not be complete at this time;
- where uncertainty remains, provide clearly defined, detailed follow-up program measures, including proposed further mitigation measures; and
- present complete or summarized information and discussion within the IR responses, rather than limited responses to references to applicable reports.

In accordance with CEAA 2012, time taken by Alamos Gold Inc. to provide the required information is not included in the legal timeframe within which the Minister of the Environment and Climate Change must make an EA decision. Issuance of this IR Package continues to keep the timeline paused at day 130 of 365. Acknowledging that responses to Round 1 Package 1 were submitted to the Agency on December 11, 2020, the conformity review deadline for these responses no longer applies.

In addition to Round 1 Package 2, the Agency is providing Alamos Gold Inc. with Attachment 2: Advice to the Proponent, and letter from ECCC to the Agency re: the *Species at Risk Act*, available here, for consideration when responding to the IRs.

The Agency welcomes the opportunity to discuss the outcome of this review with you and provide further advice on how to best address the information required to move forward with the assessment process. If you have any questions, please contact me at Melissa.Pinto@canada.ca or 587-338-7191.

Sincerely,

<*original signed by*>

Melissa Pinto, Project Manager

Enclosure(s):
Lynn Lake Gold Project - Technical Review Information Requests Round 1, Package 2
Attachment 2: Advice to the Proponent

c.c.: Chris Bostwick, Vice President Technical Services, Alamos Gold Inc.
Michael Raess, Senior Environmental and Community Relations Coordinator, Alamos Gold Inc.
Karen Mathers, Project Manager, Stantec Consulting Ltd.

Lynn Lake Gold Project – Technical Review Information Requests Round 1, Package 2
December 2020

List of Acronyms and Abbreviations

Acronym or Abbreviation	**Definition**
AAQC	Ambient Air Quality Criteria
ABA	Acid-Base Accounting
ARD	Acid Rock Drainage
BMP	Best Management Practice
CAAQS	Canadian Ambient Air Quality Standards
CAC	Criteria Air Contaminant
CCME	Canadian Council of Ministers of the Environment
CCN	Chemawawin Cree Nation
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CO	Carbon Monoxide
COPC	Contaminant of Potential Concern
dBL	Decibels
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
FTM	Freeze-Thaw Model
GHG	Greenhouse Gas
HC	Health Canada
IAAC	Impact Assessment Agency of Canada
kph	Kilometres per hour
LAA	Local Assessment Area
m/s	Metres per second
MCCN	Mathias Colomb Cree Nation
MDMER	*Metal and Diamond Mining Effluent Regulations*
MEND	Mine Environment Neutral Drainage
ML	Metal Leaching
MMF	Manitoba Metis Federation
MRSA	Mine Rock Storage Area
NAG	Net Acid Generating
NMD	Neutral Mine Drainage
NO_2	Nitrogen Dioxide
NP	Neutralization Potential
NSZ	North Shear Zone
NRCan	Natural Resources Canada
PAG	Potentially Acid Generating
PDA	Project Development Area
PM	Particulate Matter
PR 391	Provincial Road 391
RAA	Regional Assessment Area
RQD	Rock Quality Designation
RSA	Regional Study Area
SDFN	Sayisi Dene First Nation
SO_2	Sulfur Dioxide
TDR	Technical Data Report
the Project	Lynn Lake Gold Project
TMF	Tailings Management Facility
TSP	Total Suspended Particulate
US EPA	United States Environmental Protection Agency
VC	Valued Component
vdB	Vibration velocity in decibel scale
$\mu g/m^3$	Micrograms per cubic metre

Lynn Lake Gold Project – Technical Review Information Requests Round 1, Package 2
December 2020

Reference IR#	Expert Dept. or group	EIS Guideline Reference	EIS Reference	Context and Rationale	Information Requests
Surface Water and Groundwater					
IAAC-56	NRCan-01	3.2.3 Spatial and temporal boundaries	8.1.4.1 Spatial Boundaries Map 8-2	The EIS Guidelines require that the rationale be provided for the selection of the boundaries of the LAAs and RAAs. In the EIS, the LAA/RAA for the MacLellan site is shown on Map 8-2. The southern boundary of the LAA/RAA is described as following a northwestern path from the northern shore of Cockeram Lake to the northern shore of Eldon Lake. This portion of the boundary appears to cut through tributaries to each of the lakes, and does not follow surface water divides as the remaining portions of the LAA/RAA boundary appears to do. To ensure the groundwater model adequately represents potential changes to groundwater-surface water interactions, LAA/RAA boundaries need to include surface water systems that the boundaries bisect and follow. Explanations of what the boundaries include are important to understand groundwater and surface water interactions. As the LAA/RAA boundaries are used to define the boundaries of the groundwater model, this information is required to assess the ability of the groundwater model to represent changes to groundwater flow and to groundwater-surface water interactions.	a. Provide a rationale for the location of the southern boundary of the MacLellan site LAA/RAA, including a description or explanation of why the boundary does not follow surface water divides, and describe any portions of tributaries that were excluded. b. Describe the potential effect of the location of the LAA/RAA on the assessment of changes to groundwater-surface water interactions in tributaries that were bisected or excluded.
IAAC-57	MCCN-21 NRCan-02	3.2.3 Spatial and temporal boundaries	8.1.4 Boundaries Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.4.1 Model Setup Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report 5.4.1 Model Setup	The EIS Guidelines require that the spatial boundaries span all phases of the Project. The EIS describes 5 to 6 years of active closure followed by 10 years of post-closure monitoring prior to permanent closure conditions. The timelines in the EIS do not reconcile with the 10 year post closure duration, as the results of the closure period assessments described in EIS Volume 5, Appendices F and G represent the period when the pit is fully flooded which is expected to take over 21 years at the MacLellan site. In addition, the EIS indicates that permanent closure will occur when the site is stable, and monitoring is no longer required: "For groundwater this would occur when the water level elevations of the pit lakes meet the design criteria and groundwater quality of seepage from mine components is demonstrated to be decreasing and/or meet relevant regulatory criteria." Additional details on how temporal boundaries for the decommissioning and closure phases were determined with regards to groundwater quantity and quality, are needed. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Considering the response to Round 1 Package 1, IAAC-38, clarify the time periods and conditions assessed for the decommissioning and closure phases of the Project with respect to groundwater quantity. Align these time periods with the results presented in the hydrogeological technical assessments in EIS Volume 5, Appendices F and G. b. Provide an evidence-based time frame over which the stability of the site (e.g., groundwater quality in reference to regulatory criteria) is assessed to determine when to cease monitoring.

IAAC-58	NRCan-03	4.3 Study strategy and methodology	8.2.1.2 Hydrogeological Model Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report Table 4-1 Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report Table 4-1	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. The EIS indicates that the groundwater model domain is terminated at the depth of the open pit for each model. For the Gordon site, the model is terminated at an elevation of 115 m above sea level. For the MacLellan site, the model is terminated at a depth of -15 m above sea level. Based on the pit depth and the topography shown in cross-sections, it is unclear whether the bottom slice of the model exactly coincides with the minimum elevation of the open pit. Although the hydraulic conductivity at the base of the open pits is expected to be low, placement of the model base at the pit floor would indicate that no flow is expected at these depths. This representation may underestimate total inflow to the pit, and change propagation of dewatering-induced drawdown. Rationale for the location of the lower model boundary, and the anticipated impact on the assessment of groundwater quantity is needed. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide a rationale for the selection of the location of the lower model boundary. b. Indicate the anticipated impact of the lower model boundary location on the assessment of groundwater quantity.
IAAC-59	NRCan-04	6.1.2 Geology and geochemistry	8.2.2.1 Local Geology and Hydrostratigraphy	The EIS Guidelines state that the EIS will present baseline information on the geomorphology, topography, and geotechnical characteristics of areas proposed for construction of major Project components. The description of the baseline geological conditions states that bedrock was encountered at depths of up to 10 m at the MacLellan site. However, throughout the remainder of the EIS, the presence of buried valleys at the MacLellan site are discussed, with up to 28 m of overburden overlying the bedrock. Clarity of these statements is required. Clarity on the depth to bedrock found at the MacLellan site is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Clarify the maximum depth to bedrock found through drilling at the MacLellan site.
IAAC-60	NRCan-05	6.1.2 Geology and geochemistry	8.2.2.1 Local Geology and Hydrostratigraphy Map 8-12	The EIS Guidelines require that a geological description of the bedrock and host rock be provided. For the Gordon site, two faults (the Wendy and the East Fault) are noted and shown on Map 8-12 of the EIS. The East Fault is shown to terminate to the east of the historical Wendy pit. Based on the trend of the fault, it does not appear that either the historical pit, or borehole drilling would confirm the termination of this fault. Given the conceptualized influence of this fault zone on the hydraulic conductivity in the vicinity of the pit, the location of these faults has the potential to have a strong influence on the drawdown and groundwater inflow rates associated with the open pit dewatering. Additional information on the rationale used to terminate the East Fault to the east of the Wendy pit is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Review and confirm the location of the East Fault termination in relation to Wendy pit. i. If the conclusion in the EIS is confirmed, provide the rationale used to terminate the East Fault to the east of the Wendy pit. ii. If it is determined that the East Fault does not terminate to the east of Wendy pit, update the groundwater assessment using the revised termination location of the East Fault zone.

IAAC-61	NRCan-06	6.1.2 Geology and geochemistry	8.2.2.1 Local Geology and Hydrostratigraphy Map 8-13 Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.2.1 Geology and Hydrostratigraphy	The EIS Guidelines require the EIS to provide geological maps and descriptions of the geology. A feature of the geology of the MacLellan site is the presence of buried valleys. The location of these features is difficult to discern on Map 8-13. As shown on Map 8-13, the bedrock low to the north of Minton Lake (GBHM-14, MWM-03) is interpreted to be distinct from the low to the east of the pit. In the absence of confirmative drilling data, a bedrock high has been inferred to be present between these two lows. The low proximal to the pit is conceptualized as being related to the location of the fault zone, whereas the Minton Lake depression is conceptualized as being a separate buried channel. Given the orientation of the faults, the proximity between the lows, and the lack of confirmatory data, there is a potential continuous buried channel between these two locations. As the bedrock lows tend to be filled with higher permeability material, connectivity of these features has the potential to alter assessment results. A rationale for the separation of these features should be provided. This information is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Provide maps showing the variation in overburden thickness across the LAA for both the Gordon and MacLellan sites. b. Review and confirm whether the low to the north of Minton Lake and the low to the east of the pit are separated (distinct from one another). Describe whether the low associated with the fault zone is presumed to be due to increased propensity to erosion within the faulted zone, or due to displacement associated with the faulting. i. If it is concluded that the two lows are distinct, provide rationale for the separation of the two bedrock lows to the east of the MacLellan pit. ii. If it is determined that there is additional connectivity between the bedrock low to the north of Minton Lake and the low to the east of the pit than what was used in the EIS, update the groundwater assessment using the revised information.
IAAC-62	NRCan-07	6.1.5 Groundwater and Surface Water	8.2.2.3 Estimation of Hydraulic Conductivity Figure 8-1 Volume 4, Appendix H 4.2.1.3 Hydraulic Conductivity 4.2.2.3 Hydraulic Conductivity Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 3.3.5 Bedrock Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report 3.3.5 Bedrock	The EIS Guidelines state that the EIS must describe the hydrogeological context of the Project, including the delineation of stratigraphic and hydrogeological boundaries, and the physical properties of the hydrogeological units. Within the EIS, the bedrock has been subdivided into 4 components for both Gordon and MacLellan sites: shallow, upper, intermediate, and deep bedrock. The hydraulic properties of these components are based on the results of hydraulic testing within the various depth intervals chosen. For the Gordon site, depth intervals of 0 to 50 m, 50 m to 100 m, 100 m to 150 m, and greater than 150 m below the top of rock define the shallow, upper, intermediate, and deep bedrock. For the MacLellan site, depth intervals of 0 to 10 m, 10 m to 50 m, 50 m to 200 m, and greater than 200 m below the top of the rock define the shallow, upper, intermediate, and deep bedrock. Rationale is missing for the selection of these depth zones, or the difference in various depths between the two sites. Provide details on what zones determination were based such as rock quality designation (RQD) or fracture frequency. EIS Figure 8-1, and other similar figures replicated in the appendices cited, display horizontal hydraulic conductivity with depth for each site. As several tests span across the hydrostratigraphic divisions within the bedrock, it is not possible to discern which tests are used in which range calculation. For the Gordon site, it is clear that no testing data is available within the deep bedrock zone. For the MacLellan site, it is not clear that there is a reduction in hydraulic conductivity with depth, as tests in the 50 m to 150 m depth range result in lower hydraulic conductivity estimates than tests at depths greater than 200 m. While there is strong evidence of decreasing hydraulic conductivity with depth within the Canadian shield, this decrease can vary with geological setting. The division of the bedrock unit into these depth zones is a controlling factor for the representation of groundwater flow at both sites. The assignment of these parameters strongly affects groundwater flow pathways to receptors, groundwater drawdown, and pit inflows. Rationale to support any conceptualization needs to be provided and clearly linked to site data. This information is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. In figures showing the relationship between depth below the top of bedrock and hydraulic conductivity, indicate which tests are completed in which bedrock zone (shallow, upper, intermediate, or deep). b. Provide the rationale for the depth selection for each bedrock subdivision. c. Describe the lack of testing of the deep bedrock zone at the Gordon site and the potential impact on model results. d. Describe the results of testing at the MacLellan site in the intermediate and deep bedrock, and the evidence for a reduction in hydraulic conductivity with depth. e. Describe any gaps in information and related uncertainty with regards to the assessment of effects to groundwater. Describe any additional mitigation measures and/or monitoring and follow-up, including adaptive management that would be implemented.

IAAC-63	NRCan-08	6.1.5 Groundwater and Surface Water	8.4.2.3 Project Residual Effects Maps 8-22 and 8-23	The EIS Guidelines state that the EIS must include groundwater levels and potentiometric contours, as well as a describe changes to groundwater flow patterns and hydrological and hydrometric conditions. EIS Maps 8-22 and 8-23 show drawdown contours during the closure phase for the MacLellan site. These figures show negative drawdown (up to 10 m) within the footprint of the open pit indicating a rise in groundwater elevations with the flooded pit relative to baseline conditions. The text does not appear to reflect the results shown on the maps, stating that groundwater elevations near the pit return to baseline conditions. Clarity on the drawdown contours is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Confirm whether the drawdown contours shown on Maps 8-22 and 8-23 are correct. Provide an updated discussion and/or maps as required.
IAAC-64	NRCan-09	6.1.5 Groundwater and Surface Water	Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.1.1 Geology and Hydrostratigraphy 4.2.2.1 Geology and Hydrostratigraphy	The EIS Guidelines require a description of hydrostratigraphy, including the overall thickness of the overburden units within the LAA. The EIS describes the development of the bedrock topographic surface within the LAA/RAA for areas in which borehole drilling has intersected bedrock. For areas of the LAA/RAA for which no depth to bedrock information is available, a general conceptual description of thinning overburden at topographic highs and thickening of overburden at topographic lows is provided. Details of how this conceptualization was applied in the development of the bedrock topographic surface used in the groundwater model was not provided. This information is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Provide details of the development of the bedrock topographic surface outside of the areas where drilling information was available. i. Describe any gaps in information and related uncertainty with regards to the assessment of effects to groundwater.
IAAC-65	NRCan-10	6.1.5 Groundwater and Surface Water	Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.1.4 Estimate of Bedrock Aquifer Parameters Appendix A Map 4A Rock Mass Properties for Surface Mines, in, Slope Stability in Surface Mining, Society for Mining and Metallurgical Exploration; Hoek and Karzulovic (2000).	The EIS Guidelines state that the EIS must include a description of the baseline hydrogeological conditions, including a description of the physical properties such as hydraulic conductivity. Hydrogeological maps and cross-sections for the mine area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, are to be provided. The EIS indicates that, for the Gordon site, pumping tests were completed in addition to single well response testing to determine the hydraulic conductivity of the bedrock unit. Results from 72-hour pumping tests between the historical pits and the lakes indicate the presence of a higher hydraulic conductivity shallow bedrock zone at 5 to 15 m (GPW-04, Wendy pit/Gordon Lake) and 8 to 15 m (GPW-02 East pit and Farley Lake) below the top of the rock. It is inferred that this higher hydraulic conductivity zone may be the result of the blast damaged zone associated with the historical pits, or a fault influenced zone associated with the Wendy and East Faults. EIS Map 4A indicates that GPW-02 is several hundred metres away from the historical East pit. Hoek and Karzulovic, 2000 estimate that the blast influenced zone from open pit mining may extend at most 2.5 times the bench height of the development. Given this relationship it can be considered unlikely that GPW-02 would be within the blast influenced zone. Both GPW-02 and GPW-04 also appear to be offset from the delineated faults by several hundred metres. Additional information is required on the fault and blast damaged zones to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Describe the conceptualization of the fault damage zone. Provide details on the method used to determine the extent of the fault damage zone. b. Discuss the blast damaged zone from the development of the historical pits. Indicate how this zone is limited to within a reasonable distance from the pits.
IAAC-66	NRCan-11	6.1.5 Groundwater and Surface Water	Volume 4, Appendix H Hydrogeology Baseline Technical	The EIS Guidelines state that the EIS must include a description of groundwater flow patterns and seasonal variability for each hydrostratigraphic unit.	a. Describe the wells and screen depths used to compare shallow bedrock to overburden groundwater flow.

			Data Report 4.2.1.2 Groundwater Flow 4.2.2.2 Groundwater Flow	The EIS presents the groundwater flow patterns for the overburden units, and states that groundwater flow directions and seasonal variations within the shallow bedrock are similar. Given the various descriptions of shallow bedrock for the MacLellan site (top 10 m or top 50 m), it is not clear which wells were used for this comparison. As the majority of the development of the open pit will be through bedrock, understanding of groundwater flow patterns and seasonal response is an important component of the conceptual modelling process. This information is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	b. Describe whether groundwater flow patterns or seasonal variability changes with depth, within the bedrock.
IAAC-67	NRCan-12	6.1.5 Groundwater and Surface Water	Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.2.2 Groundwater Flow	The EIS Guidelines state that the EIS must include a description of groundwater flow patterns and seasonal variability for each hydrostratigraphic unit. The EIS notes that several wells exhibit more than twice the seasonal variability observed across the site. However, there is no conceptualization provided for the cause of this variability. The EIS also notes the association between artesian conditions and the flanks of topographic highs. However, GBHM-18 does not appear to be located in this setting, yet is artesian. The relationship between topographic and hydrostratigraphic conditions and groundwater flow patterns can be used to infer flow conditions where groundwater level information is not available. This information can improve model calibration and assessment results, and is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Describe the topographic and hydrostratigraphic conditions that result in greater seasonal variability in groundwater elevations. b. Provide an assessment and discussion of the topographic and hydrostratigraphic conditions at GBHM-18, and whether these conditions may occur elsewhere within the MacLellan site LSA.
IAAC-68	NRCan-13 NRCan-14	6.1.5 Groundwater and Surface Water	8.2.2.3 Estimation of Hydraulic Conductivity Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.2.2 Groundwater Flow 4.2.2.3 Hydraulic Conductivity Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report 3.3.5 Bedrock	The EIS Guidelines state that the EIS must include a description of the baseline hydrogeological conditions, including physical properties such as hydraulic conductivity. Section 8.2.2.3 notes that hydraulic conductivity tests in the bedrock below the TMF yielded higher values relative to other areas of the site. Although referenced in the text, no tables were provided summarizing the vertical gradients or hydraulic conductivity testing results for the MacLellan Site. With the absence of Table 5B (EIS Volume 4, Appendix H) it is difficult to discern the number of tests with higher hydraulic conductivity and the degree to which the hydraulic conductivity is higher. Given that regional bedrock mapping presented throughout the EIS indicates a change from metavolcanic to metasedimentary bedrock in the vicinity of the TMF, the noted differences in hydraulic conductivity may have a geological control. A zone of increased bedrock hydraulic conductivity has the potential to increase the quantity of seepage from the TMF. Additional information on bedrock hydraulic conductivity is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Provide the bedrock hydraulic testing data in the area of the TMF. b. Provide tables summarizing vertical gradients and hydraulic conductivity testing results for the MacLellan Site. c. Describe differences in rock type and RQD in the vicinity of the TMF at the MacLellan site LSA. d. Describe the rationale for a uniform, vertically variable bedrock unit across the LSA in light of the difference noted near the TMF. i. If uncertainty remains, provide a discussion of the gap in information and related uncertainty with regards to the potential effects assessment for groundwater.

IAAC-69	NRCan-15	6.1.5 Groundwater and Surface Water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report Appendix A Maps 5 and 6 Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report Appendix A Maps 5 and 6	The EIS Guidelines require that the EIS contain maps showing the regional surficial and bedrock geology. While maps showing regional surficial and bedrock geology are provided in the EIS, the scale of these maps does not display conditions within the LSAs, and the spatial relation between Project infrastructure and geology to the extent needed. As the surficial and bedrock geology dictates the parameterization of the numerical groundwater flow model, this information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide maps showing the bedrock and surficial geology at the LSA scale for both sites.
IAAC-70	NRCan-15	6.1.5 Groundwater and Surface Water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 3.3.5.1 Shallow Bedrock Appendix A Map 9	The EIS Guidelines require the EIS to include fault zones in the descriptions of site geology. For the Gordon Lake site, a faulted zone associated with the East and Wendy Faults is shown on Map 9. Assessment results for groundwater inflow to the open pit and drawdown associated with the open pit are sensitive to the parameterization of this fault zone. From the faulted zone depicted on Map 9 it is difficult to discern whether this zone extends below Gordon Lake (matching the fault trace), or if it is terminated at the Lake. Limited information is provided on the structure, depth, and orientation of the fault zone. While modelled as vertical zone through the upper 50 m of bedrock, no supporting information is provided to confirm the geometry of this zone. Additional information on the location and spatial extent of the fault zone is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide details on the location, geometry, and spatial extent of the fault zone (structure, depth, orientation, etc.). Where available, include information from drilling data, surface expression, and the historical pit development. If the vertical and horizontal extents of the fault were investigated through model calibration, include these details. i. If any of the details requested above cannot be provided, describe the gap in information, related uncertainty with regards to potential effects and mitigation, and any additional mitigation measures and/or monitoring and follow-up that would be implemented.
IAAC-71	NRCan-16	4.3 Study strategy and methodology	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 4.1 Model Domain Appendix G Lynn Lake Gold Project, Hydrogeology	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. A component of the groundwater modelling for both sites is the development of a numerical mesh. Mesh discretization can affect model stability and assessment results. Details on the development of the numerical mesh for the groundwater models, such as information on element edge length, and areas of refinement, should be provided. Additional details on the development of the numerical mesh are required. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe the development of the numerical mesh for the groundwater models, including information on element edge length, and areas of refinement.

			Assessment - MacLellan Site Technical Modelling Report 4.1 Model Domain		
IAAC-72	NRCan-17	4.3 Study strategy and methodology	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 4.3.3 Lakes and Watercourses Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.3.3 Lakes and Watercourses	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. Documentation for models to be provided includes the assignment of boundaries to represent groundwater interaction with surface water. The type of boundaries assigned are described in detail in the assessment reports; however, the location and head values for the boundaries are not provided. These boundaries influence model calibration and assessment results. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. For both sites, provide a map showing the locations of assigned lake/river boundary conditions, and their assigned head values. b. Where the model domain is terminated at a lakeshore with the lake external to the model (i.e., Simpson and Serge Lakes for Gordon, and Cockeram, Arbour, and Burge Lakes for MacLellan), provide details on the boundary condition applied on the edge of the model domain.
IAAC-73	NRCan-18	4.3 Study strategy and methodology	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 4.4.2 Calibration to Water Levels Table 4-2 Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.4.2 Calibration to Water Levels Table 4-2	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. A component of the documentation is the presentation of calibration to observed groundwater levels. Calibration results are provided in Table 4-2 of both hydrogeology assessment reports. From these tables it is difficult to determine which unit each well is screened within. This information is necessary because evaluation of the calibration of the model can affect the interpretation of the model results. Table 4-2 in each assessment report needs to be updated to include the screened hydrostratigraphic unit, and the screened units need to be highlighted in the calibration plot. For the MacLellan model, many of the simulated water levels are within several metres of the observed water levels with a bias towards simulated values being higher than observed. However, simulated water levels at three locations (MWM-04, MWM-09A/B, and GBHM-06A) are more than 7 m lower than observed. Two of these locations (MWM-09A/B and GBHM-06A) are within the pit footprint where misfits in model calibration have a greater impact on assessment results. The rationale for these large differences between simulation and observation are needed, including the provision of possible impacts of these differences on model results. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Update Tables 4-2 to include the screened hydrostratigraphic unit, and highlight the screened units on the calibration plot. b. For the MacLellan site, provide rationale (including the hydrostratigraphy and topographic setting) for the wells with larger differences between simulation and observation. i. Include a discussion of the impact on model results. Describe the associated uncertainty of model results and potential impacts on the assessment of effects to groundwater. Describe any additional mitigation measures and/or monitoring and follow-up that will be implemented.

IAAC-74	NRCan-19	6.1.5 Groundwater and Surface Water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 4.4.2 Calibration to Water Levels Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.4.2 Calibration to Water Levels	The EIS Guidelines state that an appropriate hydrogeological model will be included in the EIS. A comparison between observed and simulated seasonal changes in groundwater elevations is provided in the hydrogeology assessment reports for both sites. A hydrogeological model requires the ability to replicate the observed variability in groundwater elevations. The models do not seem capable of replicating the higher degree of seasonal variability observed at certain wells. For the Gordon site, the groundwater model was not able to match the magnitude of change in groundwater wells with greater than 1 m of seasonal variability (including MWF-02, MWF-04, GBHF-07, GBHF-09, and GBHF-10). Discussion of factors that lead to this difference are not discussed. For the MacLellan site, the transient calibration was unable to reproduce the observed seasonal variability in groundwater elevations. It is stated that this discrepancy is likely due to the surface water features being held at a constant elevation through the transient simulation. However, it is not clear whether surface water monitoring would support the degree of elevation change noted in the monitoring wells. For example, GBHM-10 shows a 3 m rise in groundwater elevation during freshet that is not replicated by the model. Given that this location is approximately 1 km from the Keewatin River, it is not clear that variations in surface water boundary elevations would allow the replication of these trends. Clarity on how seasonal variability was incorporated into the hydrogeological model is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe the hydrostratigraphy, topography, groundwater flow regimes, and groundwater-surface water interactions for wells that display seasonal variability in groundwater elevations. b. Where the groundwater models are unable to simulate the seasonal variability, provide a rationale, describe related uncertainty and how differences may affect assessment results. Describe any additional mitigation measures and/or monitoring and follow-up that will be implemented.
IAAC-75	NRCan-20	6.1.5 Groundwater and Surface Water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 4.4.3 Calibration to Baseflow Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.4.3 Calibration to Baseflow	The EIS Guidelines state that groundwater-surface water interactions will be characterized and included in the hydrogeological model. In the EIS, to assess the ability of the groundwater model to represent observed groundwater-surface water interaction, the simulated quantity of groundwater discharge was compared to the total annual surface water flux at one station within each model. The assessment reports note that baseflow can be a difficult parameter to derive from field measurements due to the storage effects of lakes and ponds. If the monitoring stations within the LAAs do not allow calculation baseflow estimates, other surface water monitoring stations within the region may act as useful analogs to estimate of the proportion of total annual streamflow that may be derived from groundwater discharge. Additional information on baseflow is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe the availability of data within the region for determination of low flow statistics and the degree to which groundwater may contribute to annual surface water flow quantities. Where reasonable analogs are available, provide a comparison of those to the groundwater model results. i. If the details requested above cannot be provided, describe the related uncertainty with regards to potential effects assessment results and mitigation, and any additional mitigation measures and/or monitoring and follow-up that will be implemented.
IAAC-76	NRCan-21	6.1.5 Groundwater and Surface Water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment –	The EIS Guidelines state that an appropriate hydrogeological model will be included in the EIS, including representation of the hydrostratigraphy.	a. Provide an assessment of fracture orientation for the fault zone at the Gordon site. Describe the effect of fracture orientation on groundwater flow. b. Describe the anisotropy that may result from the interbedding of nearshore and offshore glaciolacustrine deposits at the MacLellan site.

			Gordon Site Technical Modelling Report 4.4.4 Calibrated Model Parameters Table 4-3 Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.4.4 Calibrated Model Parameters Table 4-3	EIS Tables 4-3 in both hydrology assessment reports present the calibrated hydraulic conductivity for each model. Based on the information presented in these tables all hydrostratigraphic units appear to be assigned isotropic hydraulic conductivities. Anisotropy in hydraulic conductivity can have a strong influence on groundwater flow directions and the propagation of drawdown associated with open pit dewatering. For the Gordon site, the orientation of the fault zone or the fractures within the fault zone are not discussed; however, any preferential orientation may result in preferential groundwater flow. An assessment of the fracture orientation for the fault zone is required, including a description of the effect of fracture orientation on groundwater flow. For the MacLellan site, the nearshore and offshore glaciolacustrine deposits are known to be interbedded. Interbedded units such as these can result in anisotropy in hydraulic conductivity when bulk values are applied. A description of how anisotropy in hydraulic conductivity may have affected model calibration and model results is required. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	c. Describe the effect of the inclusion of anisotropy on model calibration, and where necessary, model results. Update the assessment if required following this analysis.
IAAC-77	NRCan-22	6.1.5 Groundwater and Surface Water	Volume 4, Appendix H Hydrogeology Baseline Technical Data Report Appendix A Map 13 Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.1 Baseline Conditions Appendix A Map 12	The EIS Guidelines state that an appropriate hydrogeological model will be included in the EIS. Note: an appropriate hydrogeological model has the ability to replicate groundwater flow patterns inferred from the groundwater monitoring network. EIS Map 13 shows the interpreted groundwater levels in the overburden based on measured groundwater elevations in the month of September. This map indicates that a groundwater divide is present to the south of the pits, with stronger gradients to the east and the west. The simulated water table elevation shown on Map 12 also indicates that a divide is present in the same region; however, the stronger gradients appear to be to the north and south. It is unclear whether this discrepancy is due the difference in contouring simulated water table elevation versus observed groundwater elevation in overburden. It is also possible that the monitoring well network did not capture all of the groundwater flow patterns near the divide. Additional information on groundwater flow is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide a comparison between simulated and observed horizontal gradients in the vicinity of the groundwater divide to the south of the open pits at the Gordon site for baseline conditions. Describe the differences where apparent. b. Describe the uncertainty related to the simulated groundwater flow with regards to the assessment of effects to groundwater. Describe any additional mitigation measures and/or monitoring and follow-up that will be implemented.
IAAC-78	NRCan-23	4.3 Study strategy and methodology	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.2.1.1 Dewatering East and Wendy Pits	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. The FEFLOW Freeze-Thaw Model (FTM) plugin was used to generate time variable pit wall hydraulic conductivity to represent the decrease in groundwater flow to the open pits during colder months. This reduction in hydraulic conductivity controls the seasonal variability in groundwater inflow to the open pit. Details of the parameterization of the FTM plugin are not provided for either site. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater surface-water interactions.	a. Provide the details of the parameterization of the FTM plugin for both sites.

			Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 5.2.1.1 Dewatering East and Wendy Pits		
IAAC-79	NRCan-24	6.2.2 Changes to groundwater and surface water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.2.1.1 Dewatering East and Wendy Pits 5.3.2.1 Open Pit Dewatering Tables 5-1 to 5-3 Appendix A Maps 15 and 18	The EIS Guidelines state that the groundwater assessment will include changes to groundwater fluxes. Changes in the quantity of groundwater discharging to surface water, or the quantity of surface water recharging the groundwater system can influence the extent of groundwater drawdown associated with open pit dewatering, and can influence other linked VCs such as surface water and wetland environments, and fish and fish habitat. Drawdown contours shown on EIS Maps 15 and 18 indicate that the unnamed lake to the north of the pits, and other smaller water courses and water bodies (i.e., FAR5-A1, FAR7-A1, Pump Lake, FAR3-SIM2, and FAR3-A1) are contributing water to the groundwater flow system at a sufficient rate to limit drawdown. The change in flux at the unnamed lake does not appear to be included in Tables 5-1 or 5-2. The flux changes for these smaller water features should be included and discussed in the context of their ability to sustain the simulated flux. As shown in Tables 5-1 and 5-3, lakes to the south of the open pit (Susan and Marnie Lakes) appear to lose less water to the groundwater flow system during the construction and operation phases in comparison to baseline conditions. Given that the recharge under the MRSA is limited to the recharge under baseline conditions, changes to boundaries do not appear to cause this shift. Additional information and clarity on groundwater fluxes is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. For the small unnamed lake to the north of the open pits, provide changes in the groundwater flux to/from the lake for all simulated phases of the Project (construction, operation, and closure). i. Describe whether the catchment area for this lake would be sufficient to sustain the quantity of water lost to the groundwater flow system under pit dewatering conditions. In doing so, ensure that fluxes used to describe groundwater-surface water interactions are in consistent units (i.e., m^3/day). b. Provide a rationale for the decrease in flux from lakes to the groundwater flow system, for the lakes to the south of the open pit during operations and construction phases. i. Describe remaining uncertainties in the groundwater flow model with regards to the groundwater effects assessment and mitigation, and any monitoring and follow-up that will be implemented to verify the assessment predictions.
IAAC-80	NRCan-25	4.3 Study strategy and methodology	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.3.1.1 Open Pit Dewatering	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. While details on the changes to boundary conditions made to represent the dewatering of the open pit are provided in the EIS and associated appendices, these details do not include the depth of the pits during the various phases of development. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater surface-water interactions.	a. Provide the details of the simulated pit depth for each of the modelled phases of the Project.

			Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 5.3.1.1 Open Pit Dewatering		
IAAC-81	MMF-06 NRCan-26	6.2.2 Changes to groundwater and surface water	Volume 4, Appendix H Hydrogeology Baseline Technical Data Report 4.2.1.4 Estimate of Bedrock Aquifer Parameters Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.3.1.2 Groundwater Interceptor Wells Appendix A Map 18	The EIS Guidelines state that the groundwater assessment will include changes to groundwater fluxes. The use of groundwater interceptor wells within the faulted zone at the Gordon site has a strong influence on the groundwater flux to the open pit. The proper operation of this interceptor well system will ensure that flows to the open pits are controlled, and that water levels in Gordon and Farley Lakes are maintained. The simulated groundwater interceptor wells were optimized to intercept a large quantity of groundwater that would otherwise discharge to the open pit. The average (although conservative) rates for these wells is twice that of the peak groundwater inflow into the open pit at the end of operations. This indicates a significant reliance on the interceptor wells to limit groundwater inflow to the open pit. The interceptor wells are simulated to be screened throughout the upper bedrock (upper 50 m from the top of rock). As shown on Map 18, more than 50 m of water table drawdown is simulated on the western side of the open pit, and more than 100 m of water table drawdown were simulated on the eastern side of the open pit. The amount of drawdown at these wells can influence the ability of the wells to pump adequate volumes of water. In addition, Indigenous Groups have expressed concern regarding the effectiveness of the well capture system as opposed to other alternatives. Additional information on the interceptor wells/well capture system is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe whether all of the simulated interceptor wells remained operable during operations simulations. b. Describe the remaining depth of water above the simulated screen base of the interceptor wells. c. Given that the pumping ability has been shown to be a strong function of well location (within or outside of the fractured zone), provide any preliminary details for the design plan for well placement to ensure the simulated pumping rate is achieved. i. If this information is not available, provide the criteria that the plan design will be based on. d. Describe the effectiveness of the well capture system. i. Provide an alternative analysis that demonstrates the reasoning behind why the well capture system is the preferred option relative to other alternatives, such as a grout curtain or cut off trench. ii. Describe whether the well capture system provides benefits for the lake and the water management requirements of the mine relative to potential alternatives.
IAAC-82	MCCN-36	4.3 Study strategy and methodology	9.4.1.1 Analytical Assessment Methods for Surface Water Quantity	The EIS Guidelines state that the proponent has the discretion to select the most appropriate methods to compile and present data, information, and analysis in the EIS as long as they are justifiable and replicable. The EIS Guidelines require that assumptions will be clearly identified and justified, and that data, models, and studies will be documented such that the analyses are transparent and reproducible. The EIS Guidelines also state that in undertaking the environmental effects assessment, the proponent will use best available information and methods, all conclusions will be substantiated, and predictions will be based on clearly stated assumptions, including how each assumption has been tested. With respect to quantitative models and predictions, the EIS Guidelines require the EIS to document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.	a. Provide detailed rationale for the use of the referenced climate scenarios for the water balance estimation and include an explanation for how climate change (i.e., a shifting climate regime over the Project lifespan and following decommissioning/closure) was considered in selecting these parameters. i. If climate change was not considered, provide a revised analysis to incorporate a climate parameter that accounts for the effects of current and projected climate change.

				The EIS notes that "[t]he baseline water balances estimated lake levels and streamflows under average, 1:25-year dry, and 1:25-year wet climate scenarios". It is not clear whether the use of these climate scenarios accounted for the potential for changing climate regimes due to climate change. Additional information describing the choice of the climate scenarios for the baseline water balance estimation is required to sufficiently assess the efficacy of this estimation and the Project effects on VCs, such as surface and groundwater.	
IAAC-83	MCCN-26 MCCN-27 MCCN-28 NRCan-27	6.2.2 Changes to groundwater and surface water 6.6.2 Effects of the environment on project	8.4.3.3 Project Residual Effects Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.3.1.3 Seepage Collection System Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 5.3.1.3 Seepage Collection System	The EIS Guidelines state that the groundwater assessment will include changes to groundwater fluxes. The EIS must also consider how local conditions and natural hazards such as extreme weather conditions and external events could adversely affect the Project, and result in effects to the environment. Groundwater fluxes from mine infrastructure such as the MRSAs can carry a chemical load that may affect groundwater or surface water quality. The EIS states that the particle tracking simulation results for both sites represent fluxes with no operating contact water collection system. However; in Section 5.3.1.3, for both sites, it is noted that a SEEP/W model was used to calculate the amount of recharge that infiltrates to the groundwater flow system, and the amount that flows laterally to the seepage collection system. It is unclear how these two statements reconcile. The EIS states that "[t]he duration of time for the new MRSA to reach a steady-state saturation condition, where the volume of water infiltrating into the MRSA from precipitation will result in an equal amount of seepage or recharge out the base of the MRSA, is expected to be longer than the duration of the construction phase of the Project (Volume 5, Appendix F). Therefore, seepage from the new MRSA and subsequently effects to groundwater quality resulting from recharge through the new MRSA, is not predicted during the construction phase of the Project." It is unclear how this conclusion accounts for seepage under transient conditions (i.e., before reaching a steady-state saturation condition). Further information to support this statement is required to enable adequate assessment of Project effects on groundwater quality. In addition, the EIS states that "[t]o account for the 17 to 28-year wetting time, the recharge rate from the new MRSA was set at **50%** of the infiltration rate during operation" (emphasis added). The basis for the 50% figure is unclear, which inhibits understanding of the efficacy of the groundwater modelling. It is furthermore unclear why a constant value was used to calculate the recharge rate over the time period described for wetting. The EIS notes that "[g]roundwater concentrations of seepage from the new MRSA were simulated under two scenarios: expected and sensitivity. The expected scenario was simulated using concentration data from field bin testing of waste rock scaled up assuming that a **normal climate year** controls pore water volume and flows through the new MRSA. The sensitivity scenario was simulated with concentration data from field bin testing of waste rock, scaled up assuming that a **25-year dry climate year** controls pore water volume and flows through the MRSA." (emphasis added). It is not clear whether the use of a 25-year dry climate year as a "worst-case" parameter accounted for the potential for changing climate regimes due to climate change. The lack of information surrounding the choice of the 25-year dry climate year for controlling pore water volume and flows in the sensitivity scenario prohibits sufficient assessment of the efficacy of this modeling exercise.	a. Provide the rate of infiltration calculated for the MRSAs from the water balance models. Provide the distribution of this water between the seepage collection system and groundwater recharge as calculated using the SEEP/W model. b. Provide details of the integration of the SEEP/W model results into the groundwater flow model including the applied recharge. i. Include the simulated flux of water that enters the model from the MRSA recharge boundary (i.e., comment on whether all of the applied recharge enters the groundwater model, and whether groundwater mounding occurs). c. Provide the effective porosities used in the calculation of travels times from the various mine facilities to their down gradient receptors. d. Describe the potential (if any) for seepage under transient conditions (i.e., before reaching a steady-state saturation condition) for MRSAs for all Project sites. Update the effects assessment with this information, or provide a rationale for why this potential (if identified) was not considered in assessing Project effects to groundwater quality. e. Provide rationale for the chosen recharge rate from the new MRSA of 50% of the infiltration rate during operation. Include the basis for using a constant value across the 17 to 28-year wetting period. f. Provide a supplementary analysis for worst-case for seepage quality and groundwater recharge quality based on a sensitivity scenario that uses a 100-year dry climate year to determine the pore water volumes. g. Provide supporting rationale, for the selection of an appropriate sensitivity scenario, taking into consideration the full range of variability for the existing hydrologic dataset and the predicted effects of climate change (i.e., a shifting climate regime over the Project lifespan and following decommissioning/closure).

				This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	
IAAC-84	NRCan-28	6.2.2 Changes to groundwater and surface water	Volume 5, Appendix F Lynn Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report 5.4.2.1 Open Pit Filling Table 5-8 Appendix A Map 21	The EIS Guidelines state that the groundwater assessment will include changes to groundwater fluxes. Changes to groundwater fluxes during the closure period can be permanent, and result in permanent changes to groundwater receptors. Results presented in EIS Table 5-8 indicate that during the closure phase Marie Lake experiences the greatest loss of water to the groundwater flow system relative to the other lakes more proximal to the open pit. As shown on Map 21 there is approximately 0.5 m of drawdown near Farley Lake at closure and no drawdown at Marie Lake. These drawdown results do not align with the flux change results reported in Table 5-8. Clarity on the groundwater flux at Marie Lake is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide a rationale for the larger change in groundwater flux at Marie Lake relative to Farley and Gordon Lakes during the closure phase. i. Describe related uncertainties with regards to the groundwater effects assessment and mitigation, and any monitoring and follow-up that will be implemented to verify the assessment predictions.
IAAC-85	NRCan-29	6.1.5 Groundwater and Surface Water	8.2.2.3 Estimation of Hydraulic Conductivity Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.3.2 Recharge	The EIS Guidelines require the EIS to describe baseline hydrogeological conditions, including physical properties such as hydraulic conductivity. EIS Section 4.3.2 states that shallow bedrock hydraulic conductivity testing data is not available for the north shear zone (NSZ) fault zone. As a result this zone was assumed to have the same hydraulic conductivity as the host shallow bedrock. However, Section 8.2.2.3 notes that hydraulic conductivity testing indicated that there was no difference between the NSZ fault zone and the host shallow bedrock. These statements appear to be conflicting. Clarity is required on what hydraulic conductivity testing was completed for the NSZ fault zone. The presence or absence of a zone of increased hydraulic conductivity associated with faulting can strongly influence groundwater inflow to the open pit and the associated groundwater level drawdown. Additional information and clarity with regards to the NSZ fault zone is required to ensure that the baseline information and conceptual model properly represent existing groundwater flow conditions.	a. Indicate what hydraulic testing data has been collected for the NSZ fault zone. b. Describe the potential impact of a higher hydraulic conductivity fault zone on assessment results. i. Indicate if additional monitoring and follow-up will be implemented to verify the assessment predictions as well as additional mitigation measures that may be required as part of an adaptive management plan.
IAAC-86	NRCan-30	6.1.5 Groundwater and Surface Water	Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 4.3.2 Recharge 4.4.4 Calibrated Model Parameters Table 4-3 Appendix A Map 5	The EIS Guidelines require that the EIS discuss hydrogeologic controls on groundwater flow (including recharge). Variability in groundwater recharge can influence groundwater flow directions and flux quantities. In the EIS, a single value for recharge was assigned in the MacLellan model. This uniform value is in contrast to the Gordon model for which recharge is varied as a function of surficial geology. Although stated, the differences in the variability of the surficial geology is not apparent in the regional mapping provided in the various technical data reports (i.e., Map 5). If these differences were noted through site drilling and test pitting, surficial geology mapping, and illustrated through the geological model, maps should be included to support this assessment. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Provide maps showing the simulated surficial geology for each site at a LAA scale. b. For the MacLellan site, describe whether the 120 mm per year of groundwater could be recharged throughout the model (as evidenced by the water balance results, and the locations where the groundwater table exceeds the ground surface elevation).

IAAC-87	NRCan-32	4.3 Study strategy and methodology	Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 5.2.1.3 Tailings Management Facility	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. In the description of the modifications made to the baseline model to represent operations phase conditions, it is stated that the TMF materials are added to the top layer of the model. While the hydraulic conductivity of these materials is provided, the configuration of the materials, and their thickness relative to the model layer thickness are not discussed. These factors, along with hydraulic conductivity, influence the quantity of seepage and particle tracking results for the TMF. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater surface-water interactions.	a. Provide a schematic cross-section showing the configuration of the tailings, high density polyethylene liner, and dam rock fill within the numerical model. i. Include the thickness of the numerical layer along with the design thickness of each material. ii. Label the materials with the hydraulic conductivity applied in the model.
IAAC-88	NRCan-33	6.2.2 Changes to groundwater and surface water	Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment - MacLellan Site Technical Modelling Report 5.2.2.1 Starter Pit Dewatering Table 5-3	The EIS Guidelines require that the groundwater assessment include changes to groundwater fluxes. The change in fluxes between groundwater and surface water can affect other VCs such as surface water and wetland environments, and fish and fish habitat. In EIS Table 5-3, the change in the quantity of groundwater discharging to the Lynn River during the construction phase is very similar in magnitude to the change simulated for the Keewatin River. Given the distance from the Lynn River to the Project area, the changes at the Lynn River are attributed to numerical artifacts. When numerical variability is of the same order as the variability that results from model boundary changes, it becomes difficult to separate true changes from model artifact. Improved model stability may improve separation of true changes from model artifacts, which may in turn affect assessment results. Additional information on the groundwater model is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Update the groundwater model where possible, by changing numerical solver settings to improve model stability, such that changes in flux being assessed are greater in magnitude than the numerical artifacts of the model. i. Where improvements to model stability result in changes to assessment results, update the effects assessment as appropriate. ii. If improvements to model stability cannot be achieved, provide justification as to why, and provide a rationale for why current model results are satisfactory.
IAAC-89	NRCan-34	4.3 study strategy and methodology	Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report 5.3.1.2 Mine Rock Storage Area and Tailings Management Facility 5.3.1.3 Seepage Collection System Appendix A Map 3	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible. Documentation to be provided for models includes the modifications made to the baseline model to represent operations conditions. The EIS states that the boundary on the TMF was changed to a recharge boundary to maintain the TMF at the tailings surface at the end of operations. However, the quantity of recharge applied was not documented. The addition of seepage boundaries at 2 m below ground surface to represent the seepage collection system during operation is also described. Although these ditches are shown on Map 3, the details in that map do not allow one to determine the locations of the active seepage nodes. As described, the water table is more than 2 m below ground surface on the upland site of the TMF. Seepage nodes in this area would not actively remove water from the model. Additional information on the boundaries related to TMF seepage is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe the changes made to the TMF boundary at the end of operations. Include the top elevation of the tailings, and the applied recharge boundary. b. Provide a map showing the locations of the boundaries applied to represent the seepage collection system. Note which nodes actively remove water from the model in both operations and closure phases.
IAAC-90	NRCan-35	6.2.2 Changes to groundwater and surface water	Volume 5, Appendix G Lynn Lake Gold Project,	The EIS Guidelines state that all models will be documented such that analyses are transparent and reproducible.	a. Provide updated Maps 15, 24, 25, and 26 to show model results that are consistent with the text description.

			Hydrogeology Assessment – MacLellan Site Technical Modelling Report 5.2.2.1 Starter Pit Dewatering 5.4.2.1 Open Pit Filling Appendix A Maps 15, 24, 25 and 26	Documentation to be provided for models includes the modifications made to the baseline model to represent operations conditions. The EIS describes the drawdown associated with the starter pit as being up to 1 m at 200 m from the pit during the construction phase, however drawdown contours associated with the starter pit do not appear on Map 15. The contours shown on Maps 24, 25, and 26 do not appear to match the associated text in Section 5.4.2.1. These maps need to be updated to show model results which are consistent with the text description. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	
IAAC-91	NRCan-36	6.2.2 Changes to groundwater and surface water	Volume 5, Appendix G Lynn Lake Gold Project, Hydrogeology Assessment – MacLellan Site Technical Modelling Report 5.3.2.1 Open Pit Dewatering Table 5-5	The EIS Guidelines require that the groundwater assessment include changes to groundwater fluxes. The change in fluxes between groundwater and surface water can affect other VCs such as surface water and wetland environments, and fish and fish habitat. In the EIS, a summary of the changes to groundwater discharge to surface water features during operations indicates that East Pond will be drained by open pit dewatering. However, the outlet of this pond (KEE3-B2-A1) appears to continue flowing and contributing recharge to the groundwater flow system. The flow from the outlet stream to the groundwater flow system appears to limit groundwater drawdown in its vicinity. If this watercourse was to run dry as a result of the draining of East Pond, groundwater drawdown would increase, and other surface water features would contribute more to the groundwater flow system. Clarification is required regarding the predictions for the East Pond outlet. This information is required to assess the ability of the groundwater model to represent changes to groundwater flow and groundwater-surface water interactions.	a. Describe how the boundaries for the East Pond and KEE3-B2-A1 are modified during operations. b. With the drainage of East Pond, describe the likelihood for its outlet to continue to flow. c. If KEE3-B2-A1 is likely to be drained during operations, provide an updated groundwater model and effects assessment. d. Indicate any monitoring and follow-up that will be implemented to verify assessment predictions as well as additional mitigation measures required as part of an adaptive management plan.
IAAC-92	NRCan-37	4.3 Study strategy and methodology 6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 3.0 Methods Appendix F Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada; MEND (2009)	The EIS Guidelines state that the EIS provide the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden, and potential construction material in order to predict metal leaching (ML) and acid rock drainage (ARD). In addition, the EIS Guidelines require that all data, models and studies will be documented such that the analyses are transparent and reproducible. As detailed in Mine Environment Neutral Drainage (MEND), 2009, the waste rock sampling program must be representative of the spatial, geological, and geochemical variability of the deposit. MEND, 2009 recommends that samples collected from drill core be recorded in block models and shown on cross-sections and plan view maps in order to best display how the sample spatially fits within the material it was intended to represent. Two plan views (Figures 4.1-1 and 4.1-5) and 6 cross sections (Figures 4.1-2 to 4.1-4 and 4.1-5 to 4.1-8) were presented in the Table of Contents of EIS Volume 4, Appendix F. However, these figures were not included in the report. In addition, the mine rock sample interval length ranged from 1.0 to 1.5 m. MEND, 2009 recommends that sample dimensions reflect the bench heights for open pits. Additionally, long sample intervals better capture the potential heterogeneity of the unit being sampled and avoid skewing results by the inclusion of sulphide or carbonate mineral clusters or veins. Short sample intervals can skew the compositional representativeness with respect to the overall lithology composition.	a. Provide cross-sections or block model images that show the location of all mine rock and ore samples from both Gordon and MacLellan deposits. Clearly show: i. the borehole traces, geology surfaces, ore zones, the anticipated location of the open pit, the location of the historic mine workings, and a legend to allow for interpretation of these images; and ii. all sample locations from both deposits in order to verify spatial representativeness of the samples. b. Provide a review of sample heterogeneity with respect to mineralogy and sample observations in the field, to justify the short sample interval utilized in this study. c. Provide tonnage estimates for each lithology from both the Gordon and MacLellan deposits and quantitative justification for the number of samples collected in consideration of the initial sampling frequency provided in MEND, 2009. The waste rock tonnages must reflect the most up-to-date mine plan.

				The EIS indicates that, over the life of mine, 239.1 Mt waste rock will be produced from MacLellan and 51 Mt waste rock from Gordon. MEND, 2009 provides a recommended minimum sampling frequency per lithology, which is a starting point from which the final sample number must be determined based on site-specific conditions and objectives, as well as the overall tonnage to be mined from each lithology. Tonnage estimates per lithology were not provided, nor an evaluation of the compositional representativeness of samples for each lithology to be mined to ensure that the main lithologies were sampled and analyzed. This information is important to understand whether the analyzed mine rock samples are representative of the spatial, geological, and geochemical variability of the deposit, thereby ensuring accurate predictions of effects from mine rock such as ML/ARD.	
IAAC-93	ECCC-33	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 4.2.2 Gordon Site	The EIS Guidelines state that the EIS must provide the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden, and potential construction material in order to predict ML and ARD. In support of its statement that both the ore and tailings from the Gordon site likely have higher ARD potential compared to the MacLellan site, the EIS indicates that "Gordon ore contains more sulphides and less carbonates than ore from the MacLellan Site" and "Gordon tailings contain similar amounts of sulphides, but less carbonates than MacLellan tailings". If the Gordon ore contains more sulphide than MacLellan, it follows that the Gordon tailings will likely contain more sulphide than tailings from MacLellan and not a similar amount, given that both ore will be processed in the same plant with the same process. Clarity is required on the amount of sulphides and carbonates contained in the ore and tailings from both sites to understand the predictions of effects from mine rock, such as ML/ARD.	a. Provide clarity on the amount of sulphides and carbonates contained in the ore and tailings from both the Gordon and MacLellan Sites and/or rationale for why the Gordon tailings are expected to have a similar amount of sulphides, when the amount of sulphides in the ore is higher.
IAAC-94	ECCC-34	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report / Validation Report 4.3.2.2 Mine Rock	The EIS Guidelines state that the EIS must provide the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden, and potential construction material in order to predict ML and ARD. In addition, the EIS Guidelines state that all data, models and studies will be documented such that the analyses are transparent and reproducible. The EIS indicates that mine-rock lithologies are grouped in three types with the addition of vein lithology. These groups include: • Igneous rock: granodiorite (I1b), diorite (I2a), gabbro (I3a), pyroxenite (I4), mafic/Intermediate; • Dykes (I3c), dacite (V1) and andesite (V2); • Argillite (S2c); • BIF (S5) and mafic sediments (S3a); and • Quartz Veins (X2a). Although the rocks in the first group are all igneous rocks, it is not clear why gabbro, pyroxenite and mafic/intermediate dykes are grouped with granodiorite, diorite, dacite, and andesite; these are mafic and ultramafic rocks with different mineralogical compositions that may exhibit different behaviour when deposited in the MRSA or used for construction. Mafic and ultramafics tend to contain more sulphide minerals that have the potential to generate ARD/ML and grouping them with the rest of the igneous rocks may mask the ability to detect this effect.	a. Provide rationale for the mine rock lithology groupings. b. Provide rationale as to whether the grouping of mafic and ultramafic rocks with igneous rocks may influence the ability to detect ARD/ML. i. If the groups are found to mask the ability of tests to detect ARD/ML, update the assessment of effects, as necessary.

				This information is required to understand whether the analyzed mine rock samples are representative of the spatial, geological, and geochemical variability of the deposit, thereby ensuring accurate predictions of effects from mine rock such as ML/ARD.	
IAAC-95	NRCan-38	6.1.2 Geology and geochemistry 6.2.2 Changes to groundwater and surface water	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 3.4.2 Characterization of Composite Samples 3.4.3 Kinetic Tests Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada; MEND (2009)	The EIS Guidelines require a geochemical characterization of expected mine material, including changes to water quality attributed to ARD and ML should be indicated. MEND, 2009 provides detailed considerations to support the design of a kinetic test program. This includes sample representativeness with respect to the material type and lithology they represent, particularly mineralogy, ARD potential, metal (loid) content, and elevated ML potential. In the EIS, a comprehensive kinetic testing program was completed, including field bins and laboratory humidity cells for overburden, ore, mine rock, and tailings. Further, the composite samples were subjected to mineralogy and static tests. A complete set of static data was not included for the kinetic test samples. In addition, sufficient rationale for the selection of kinetic test samples was not provided to justify the representativeness of the tested samples, and to confirm that the source terms of the upper case scenario is realistic. Additional information is required, including the static test data for the kinetic test samples in relation to the overall static test database for the same material type. For waste rock this should be completed for each lithology. Tables or figures can be used to present the percentile rankings of the kinetic test sample against the appropriate static test database for each kinetic test sample. This evaluation must be completed for acid-base accounting (ABA), trace metal, and shake flask extraction results for parameters of interest, including but not limited to neutralization potential (NP), total sulphur, neutralization potential ratio, silver, aluminum, arsenic, cadmium, copper, fluoride, molybdenum, nickel, lead, selenium, and uranium. Provision of raw data, and rationale for sample selection, is needed to validate the conclusions drawn in the EIS regarding potential for mine material to result in ARD and ML.	a. Provide the static test data for all kinetic test samples. b. Provide a rationale for the selection of kinetic test samples including a detailed quantitative review of the representativeness of each kinetic test sample with respect to the material type/lithology that they represent and parameters of interest with respect to ARD/ML (ABA, trace metal, shake flask extraction for parameters of interest including but not limited to NP, total Sulphur, neutralization potential ratio, silver aluminum, arsenic, cadmium, copper, fluoride, molybdenum, nickel, lead, selenium and uranium).
IAAC-96	NRCan-39	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 3.0 Methods	The EIS Guidelines require a geochemical characterization of expected mine material. In addition, the EIS Guidelines state that all data, models, and studies will be documented such that the analyses are transparent and reproducible. In the EIS, net acid generating (NAG) tests were stated to have been conducted but results were not tabulated, nor were NAG tests considered in the evaluation of ARD potential. Further, detailed methods were not provided with respect to the use of sequential NAG tests, or an evaluation of oxidation of sulphide minerals and thus the effectiveness of the test to capture the ARD potential for material with a high sulphur content. This information is necessary to provide a complete picture of the data evaluated for geochemical characterization of mine material, and to support validation of the conclusions made in the EIS regarding the potential for mine material to result in ARD and ML.	a. Provide the tabulated NAG test results along ABA data. b. Describe the NAG methods used and approach to data evaluation, and provide a detailed review of how the NAG test results compare with the ARD potential determined through ABA tests.
IAAC-97	NRCan-40	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 3.0 Methods	The EIS Guidelines require a geochemical characterization of expected mine material. The development of an ARD block model based on the exploration geochemistry database is an excellent method to support mine rock management planning. It is noted that the multi-element analysis presented in the EIS did not include total inorganic carbon, which was statistically derived based on major elements associated with NP. The calculated NP and acid potential derived from total sulphur were used to determine the proportion of potentially acid generating (PAG) and non-PAG waste rock at	a. Provide a detailed validation of the block model using the baseline geochemistry data as well as the feasibility of waste segregation using a sulphur cut-off of 0.11 weight % both in terms of the physical segregation of materials at an operational level as well as mine sequencing.

			4.6 ARD Block modeling results Geochemical Baseline Technical Data Validation Report 2.0 Existing Data	both sites. However, it is not clear if the geochemical data collected as part of the baseline study was included in the model and used to validate the projections of PAG and non-PAG waste based on the statistically derived NP. The ARD block model should also be used to evaluate the feasibility of using the proposed sulphur cut-off of 0.11 weight % based on the distribution of PAG and non-PAG materials and mine sequencing. Further, the full list of analytes from the multi-elemental analysis of 20,782 samples was not provided. If ML potential is correlated with total metal content, as determined for arsenic, then the block model can also be used to determine waste rock zones with high metal content that could present elevated risk for ML. This information will provide a complete picture to support validation of the conclusions made in the EIS regarding the potential for mine material to result in ARD and ML.	b. Provide a list of parameters included in the multi-elements scan and justification for why this was not included in the block model to evaluate zones of elevated metal content.
IAAC-98	NRCan-41	6.1.2 Geology and geochemistry 6.2.2 Changes to groundwater and surface water	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 4.0 Results Geochemical Baseline Technical Data Validation Report 3.3 Monitoring of Historical Features 3.4 Validation Summary	The EIS Guidelines require a geochemical characterization of expected mine material. At MacLellan site, due to lack of runoff or seepage at the time of sampling, groundwater wells in the northeast corner of the historic rock storage area are considered to represent contact water with the historical mine rock. These wells report elevated sulphate, mildly acidic pH, and elevated concentration of phosphorus, copper, zinc, cadmium, arsenic, iron, and nickel. At Gordon site, runoff and seepage from the north mine rock storage area reported elevated concentrations of ammonia, arsenic, and selenium. The south mine rock storage runoff and seepage reported elevated ammonia, nitrogen dioxide, selenium, arsenic, iron, and chromium concentrations. Both pit lakes report chemical and thermal stratification, with elevated arsenic, fluoride, and iron, associated with anoxic conditions below 10 m, and elevated phosphorus associated with both surface and deep samples. Monitoring indicates that the lakes are meromictic. Water quality associated with the historic mine workings is considered a proxy for future mine rock. Site performance is generally more indicative of reactivity than laboratory tests. However, no comparison of the geology and mineralogy of the historic mine rock and future mine rock were provided to justify this. Significant changes in the geology and mineralogy of the mine rock to be disturbed by the Project can greatly affect the potential that material could generate ARD/ML. This information will provide a more complete picture to support validation of the conclusions made in the EIS.	a. Provide a comparative evaluation of the geology, mineralogy, and ARD/ML potential of the historic waste and future waste. i. Include consideration of historic and current geology, mineralogy, and geochemical data and observations, the ARD block model, as well as include block model images or cross sections that clearly distinguish between the historically mined rock and the future mine rock to developed in the open pits. ii. If differences exist between the historically mined rock and the future mine rock, update the effects assessment with this information or provide a rationale for why water quality associated with historic mine workings is an appropriate proxy for future mine rock.
IAAC-99	NRCan-42 ECCC-36	2.2 Alternative means of carrying out the project 6.1.2 Geology and geochemistry 6.2.2 Changes to groundwater and surface water	Volume 4, Appendix F Geochemistry Baseline Technical Data Report Geochemical Baseline Technical Data Validation Report 4.0 Closure Prediction Manual for Drainage	The EIS Guidelines require a geochemical characterization of expected mine material. As stated in EIS Section 4.0 of the Validation Report, monitoring results downstream of the Gordon waste rock storage site do not show any sign of ARD and thus management of historic waste through blending of PAG and non-PAG rock and cover with overburden and topsoil is considered to be effective to control ARD/ML after closure at both Gordon and MacLellan sites, despite the differences in geology between the sites. Contact water quality at the MacLellan site reports mild acidity and elevated sulphate and metals, indicative of ARD. Waste at both sites was placed between 1996 and 1999 (Gordon site) and 1986 and 1989 (MacLellan site) and thus exposed to weathering for up to 24 and 34 years, respectively. Kinetic tests on the argillite (FL S2C), considered to have the highest ARD potential of all waste rock lithologies at the Gordon site, and the MacLellan sample "ML WR S>1%" do not report acidic leachate in testing to date. Although both samples report elevated sulphur content, they also both contain significant NP (upper quartile) in comparison with other argillite and mine rock samples at Gordon and	a. Provide additional justification for the use of existing mine waste contact water as a proxy for future contact water, particularly in light of the review of sample representativeness requested in IAAC-60. b. Provide a plan to conservatively evaluate the long-term ARD potential of the argillite unit, including timing to the depletion of buffering capacity and the onset of acidic leachate as well as ML potential associated with acidic drainage. Consider the evaluation of the kinetic behaviour of blended future mine waste to demonstrate the potential that buffering capacity from other materials is successful at preventing the development of acidic drainage from the argillite and MacLellan waste rock.

			Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada; MEND (2009)	MacLellan, respectively. Per MEND, 2009 guidance, neither sample is considered to be sufficiently conservative in their representation of PAG rock from the Gordon argillite unit or the MacLellan mine rock. Further, based on NP depletion rates for the Gordon argillite sample, the timing to onset of ARD is approximately 30 years, which is longer than the period of exposure to date (up to 24 years) of the existing waste rock pile. It is thus possible that the ARD potential of historical material at Gordon site has not been realized. Blending of PAG rock with non-PAG rock as a means to minimize the development of ARD/ML from the waste rock piles at both sites must be supported by a conservative evaluation of the risk that localized zones of ARD/ML could be developed, should waste with high sulphur content and low NP be placed on the edge or top surface of the piles. The evaluation of the feasibility of blending and cover for the proposed WRSAs must consider mine sequencing to ensure that sufficient blending of PAG waste with rock containing high buffering capacity is realistic and practical at the operations level. Further, consideration should be given to segregation and backfill of PAG waste in the open pit at Gordon site as a means of managing PAG waste rock. This information will provide a more complete picture to support validation of the conclusions made in the EIS.	c. Provide an evaluation of options for mine waste management to minimize ARD/ML at both Gordon and MacLellan sites in consideration of the differing geology at both sites, planned mine sequencing, and practicality at the operations level. i. Indicate the preferred option and provide supporting rationale. ii. Provide a detailed description of how blending of waste rock will be undertaken and how it is anticipated to avoid hot spots and prevent potential ARD/ML from the MRSAs.
IAAC-100	NRCan-43	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 4.0 Results Geochemical Baseline Technical Data Validation Report	The EIS Guidelines require a geochemical characterization of expected mine material. Contact water downstream of the Gordon WRSA is not acidic, however elevated concentrations of nitrogen species are suggestive of the dissolution of blasting residuals, and elevated metal concentrations indicate that neutral mine drainage (NMD) is not mitigated through blending and cover. Neutral leaching potential has been identified in various rock types from both Gordon and MacLellan mine through kinetic tests. A more detailed evaluation of NMD is required to support mine waste management planning, including the identification of waste rock types and zones of high ML potential to evaluate the option to segregate waste not only for ARD potential but also for neutral ML potential. This information is required to fully understand the Project effects on water quality.	a. Provide an evaluation of the potential for the development of NMD, mine rock lithologies that are associated with higher potential, and zones within the two deposits that may contain waste with higher potential to develop NMD. i. Include consideration of the practicality of segregating waste with high NMD potential. ii. If there is a potential for the development of NMD, update the effects assessment for water and describe any changes in the conclusions. Indicate if additional mitigation measures are required.
IAAC-101	NRCan-44	6.1.2 Geology and geochemistry	Volume 4, Appendix F Geochemistry Baseline Technical Data Report 3.3.1 Solid Samples Appendix C Geochemical Baseline Technical Data Validation Report 4.0 Closure	The EIS Guidelines require a geochemical characterization of expected mine material. Overburden is considered to have a low risk of ARD/ML based on testing to date and confirmed by the monitoring of contact water from the historical overburden storage area at Gordon site. EIS Volume 4, Appendix F, Appendix C provides a summary table of all samples collected to date from Gordon site, including overburden. A similar table is not provided for MacLellan site, and based on the description in Section 3.3.1, which states that 49 samples were collected from drill holes near the proposed open pits; it is not clear which open pits were considered and whether any overburden samples were collected from MacLellan site. A map of sampling locations was not provided to confirm the location of the boreholes with respect to the historic and proposed pit outlines. Considering the use of the existing contact water from the overburden storage area at Gordon site to justify the low risk of all overburden materials for the Project, including MacLellan site, a thorough comparison of the historic and future overburden to be disturbed is required. A comparison of the types of overburden anticipated to be disturbed at MacLellan site is required to support any justification that Gordon site overburden can be used as a proxy for MacLellan site, as	a. Confirm if overburden samples were collected at MacLellan site and provide a table summarizing the descriptions for these samples, similar to the one presented in Appendix C. i. If samples were not collected, provide justification for why overburden from Gordon site is considered a reasonable proxy. ii. Indicate any related uncertainty in regards to potential effects and mitigation, and what monitoring and follow-up will be implemented to verify assessment predictions as well as additional mitigation measures required as part of an adaptive management plan. b. Provide a map showing the locations of all overburden samples relative to the historic mine workings, proposed mine development, and surficial geology at both the Gordon and MacLellan sites.

				well as future overburden to be disturbed at Gordon site. This information is required to fully understand Project effects to water quality.	
IAAC-102	ECCC-35 MMF-13 NRCan-45	6.1.2 Geology and geochemistry 6.2.2 Changes to groundwater and surface water 6.6.1 Effects of potential accidents or malfunctions	22.5.1 Tailings Management Facility Malfunction Volume 4, Appendix F Geochemistry Baseline Technical Data Report Geochemical Baseline Technical Data Validation Report	The EIS Guidelines require a geochemical characterization of expected mine material, changes to water quality attributed to ARD and ML associated with the storage of waste rock, ore, low grade ore, tailings, overburden and potential construction material. The proponent must also conduct an analysis of the risks of accidents and malfunctions across all phases of the Project, determine their effects, and present a preliminary emergency response measures and capacities. Tailings are expected to generate ARD and associated ML in the long-term, and no development of ARD is expected during operations. During operations, tailings contact water will be managed and in closure a cover will be placed on the TMF. In post-closure, metals in seepage could be attenuated by the overburden. Further, aging tests show that weak acid-dissociable cyanide degrades but is still present at elevated concentrations after a duration of testing. Process water was not analyzed as part of the tailings geochemical baseline study. The timing to onset of acidic conditions in the tailings is estimated to be as soon as eight years based on depletion calculations. Depletion calculations are theoretical in nature and account for reaction times under controlled laboratory test conditions and thus do not account for factors such as the armouring of buffering minerals with secondary oxidation products or the accelerated kinetics of oxidation reactions once initiated. Time equivalency of laboratory tests should also be considered based on the water to rock ratio in the tests and site rainfall. Management of PAG tailings during operations will consider the continual burial of tailings under a fresh layer and thus minimizing the exposure time of fresh tailings. A comprehensive options analysis needs to be completed to determine the best available approach for tailings management and mitigation of ARD/ML and cyanide. In addition, the proponent has not clearly indicated the type of cover that will be implemented on the TMF during closure. In the EIS it is indicated that a soil cover will be used for the TMF and that an estimated 75% of the final tailings surface area will be covered and vegetated. However, the EIS indicates that the preferred clay materials are not known to be found on site and that therefore a sandy material may be required, increasing the permeability, and leading to seepage. Additional information on tailings management to minimize ARD/ML is required on to fully understand Project effects to water quality.	a. Provide a detailed summary of the method used to determine the timing to onset of acidic conditions in the tailings samples, including a comparative evaluation of the timing based on samples considered most representative of future tailings to be managed in the facility and thus generating seepage. Include expectations for process water quality and how this will influence seepage quality with respect to ARD/ML and cyanide. b. Describe why there will be no development of ARD during operations. c. Provide a review of the management options for tailings and the TMF being considered and how they address the potential for ARD/ML and seepage containing elevated cyanide, during all phases of the Project. i. Indicate the preferred option and provide supporting rationale. d. Provide detailed plans for closure of the TMF including sourcing and use of appropriate materials so that infiltration and seepage is managed.
IAAC-103	MCCN-22 MCCN-29	4.2.2 Community knowledge and Aboriginal traditional knowledge 6.5 Significance of residual effects	8.1.6 Significance Definition	The EIS Guidelines state that the EIS will integrate Aboriginal traditional knowledge into all aspects of its assessment including both methodology and analysis. The EIS Guidelines require the EIS to consider a number of criteria for the determination of significance of Project effects, including magnitude, geographic extent, timing, duration, frequency, reversibility, ecological and social context, and the existence of environmental standards, guidelines, or objectives for assessing the effect. The EIS states that the significance definitions for Change in Groundwater Quantity and/or Flow and Change in Groundwater Quality are defined ultimately by changes to water quantity and quality for groundwater supply wells located beyond the PDA within the LAA/RAA. Groundwater supply wells were used as a proxy in the EIS for the full range of environmental effects to groundwater quality and quantity from the Project.	a. Conduct a revised significance determination for Project effects to groundwater quantity and quality based on the criteria required by the EIS Guidelines, including magnitude, geographic extent, timing, duration, frequency, reversibility, ecological and social context, and environmental standards, guidelines or objectives. i. Describe how Aboriginal traditional knowledge and applicable regulatory documents were considered in the revised significance determination. b. Provide a rationale for groundwater supply wells and their utility for groundwater users as the basis for the significance determination thresholds for effects to groundwater quantity and quality. Incorporate environmental standards, guidelines, or objectives into thresholds.

				Information on the extent to which Indigenous knowledge and use was considered in the significance determination and clarity as to why groundwater supply wells were used as a proxy for the full range of environmental effects is required to understand the Project effects.	c. Indicate how Indigenous knowledge related to groundwater quantity and impacts to rights, were considered in the development of thresholds for significance determination. i. If this was not completed, indicate how opportunities will be provided to engage with Indigenous Groups regarding the groundwater effects assessment.
IAAC-104	MMF-08 MMF-10	2.2 Alternative means of carrying out the project 2.4 Application of the precautionary approach 6.1.5 Groundwater and Surface Water 6.6.1 Effects of potential accidents or malfunctions 8.0 Follow-up and Monitoring Programs	8.9 Follow-up and Monitoring 9.9 Follow-up and Monitoring 22.5.1 Tailings Management Facility Malfunction 22.5.2.3 Environmental Effects Assessment Volume 4, Appendix F Geochemistry Baseline Technical Data Report Appendix B Tables 4.3-1 and 4.3-5	The EIS Guidelines require the proponent to conduct an alternative means assessment of Project components, including mine waste disposal. The EIS Guidelines also require that the EIS consider the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form, and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events, and that the EIS describe the preventative measures and design safeguards that have been established to protect against such occurrences. The analyses included in the EIS must also demonstrate that all aspects of the Project have been examined and planned in a careful and precautionary manner in order to avoid significant adverse environmental effects. Despite the risk of ARD/ML from the TMF and MRSAs, the EIS indicates that modelling predictions are conservative as attenuation mechanisms are not considered. However, should ARD occur, it would substantially change the water quality modelling predictions. With the consideration of operational malfunctions deteriorating receiver water quality, the EIS needs to consider the potential effects of the TMF and MSRAs on groundwater and surface water. The EIS needs to describe the potential impacts that higher-than-predicted amounts of untreated TMF seepage and supernatant entering the Keewatin River system would have on land users downstream. Should any operational malfunctions occur which result in the release of site contact water to receivers, there is the potential for serious impacts on land users. In the EIS, the proposed MacLellan site plan indicates that the MacLellan MRSA wraps around the TMF facility. It is unclear if it would enable the proponent to expand the footprint of the proposed TMF should the life of mine be extended through the discovery of additional ore reserves. It is unclear, whether the proponent has conducted a rigorous alternative means assessment to the proposed layout of the TMF. Clarity as to whether the TMF is designed to ensure the facility is able to expand, is needed. This information is necessary to understand potential impacts of the Project on the environment. Additional information on the TMF, its operation and design, including relevant mitigation measures, and related alternative means assessment is required to understand its effects on water quality.	a. Describe the potential for lining the TMF and MRSAs with an impermeable foundation, such as a geomembrane, to minimize the interaction between surface water and groundwater. b. Describe and assess the changes to the effects assessment if a liner is used. c. Provide an alternative means assessment and rationale demonstrating the preferred type of tailings (i.e., slurry, paste, dry stack). d. Indicate whether an independent tailings review board will be established prior to TMF construction, given the geochemical risks of the TMF. i. If an independent tailings review board is established, indicate how this board could assist in mitigating and managing risks associated with the TMF. e. Indicate if current Project plans allow the expansion of the TMF capacity using the downstream raise dam design should the life of mine be extended beyond the expected mine life and describe the potential implications of any expansions of the TMF. i. If the proponent is unable to expand the TMF capacity at the proposed location, indicate where additional tailings generated by the Project could be stored. f. Indicate how Indigenous knowledge was incorporated into the design of the TMF.
IAAC-105	NRCan-46	2.2 Alternative means of carrying out the project	2.9 Alternative Means for Carrying Out the Project Table 20A-1 Volume 5, Appendix D Lynn Lake Gold Project, Hydrology Water Balance and Water	The EIS Guidelines require the proponent to conduct an alternative means assessment of Project components, including mine waste disposal. The EIS Guidelines also require the proponent to include descriptions of the Project activities, including plans for decommissioning and abandonment, and the preliminary outline of a decommissioning and reclamation/closure plan. The Minerals and Metals Policy of the Government of Canada with regards to mine reclamation expects industry and the government to develop comprehensive plans for the reclamation of disturbed areas, including the provision of satisfactory financial assurances to cover the costs of reclamation and, where necessary, long-term maintenance.	a. Conduct and provide an alternative means assessment for mine waste management at the Gordon site, including a comparison of backfill of waste rock in the open pit with the placement of an engineered cover on the MRSA at closure. i. Describe the methodology used to conduct the alternative means assessment, including what guidelines and policies were followed to conduct the alternative means assessment. ii. Identify the preferred option for mine waste disposal and the associated rationale.

			Quality Impact Assessment: Gordon Site Technical Modelling Report Appendix I The Minerals and Metals Policy of the Government of Canada; Natural Resources Canada (1996)	In the EIS, for the Gordon site, the assessment of alternative means for mine waste management did not consider backfill of waste rock in the open pit as an alternative. It was noted that loading of several metals (selenium), arsenic, chromium, and uranium), are expected to be high in seepage water from the waste rock pile. While collection ditches will capture this seepage during operation, at closure covering the pile may only work for 1 to 3 centuries as the cover will erode with time and long-term stability under climate change will require regular inspection and adaptation. Additional information is required to understand whether alternative means exist for mine waste disposal at the Gordon site and the related environmental effects.	
IAAC-106	NRCan-50	2.2 Alternative means of carrying out the project	5.2.6 Geochemistry 8.4 Assessment of Residual Environmental Effects on Groundwater 10.0 Assessment of Potential Effects on Fish and Fish Habitat 20.1 Summary of Changes to the Environment, Potential Effects, Mitigation and Residual Effects	The EIS Guidelines require an alternative means assessment of Project components, including mine waste disposal. The EIS Guidelines also require the proponent to include descriptions of the Project activities, including plans for decommissioning and abandonment, and the preliminary outline of a decommissioning and reclamation/closure plan. The Minerals and Metals Policy of the Government of Canada with regards to mine reclamation expects industry and the government to develop comprehensive plans for the reclamation of disturbed areas, including the provision of satisfactory financial assurances to cover the costs of reclamation and, where necessary, long-term maintenance. For the MacLellan site, the magnitude of potential residual effects due to total aluminum, total arsenic, total and dissolved cadmium, total copper, and fluoride are characterized as moderate during post-closure. This is because predicted concentrations of these parameters exceed modelled baseline + 20% and the long-term guidelines for the protection of aquatic life, but are not expected to result in adverse effects on aquatic biota (evaluated in the fish and fish habitat assessment). However, selenium and nickel are not mentioned, even if these parameters have Canadian Council of Ministers of the Environment (CCME) water quality guidelines for the protection of aquatic life, and high concentrations may pose risks to aquatic wildlife. The potential residual effects due to nickel and selenium should be considered in the assessment. Additional information is required to understand whether alternative means exist for mine waste disposal at the MacLellan site and the related environmental effects.	a. Conduct and provide an alternative means assessment for mine waste management at the MacLellan site, including a comparison of backfill of waste rock and/or tailings in the open pit with the placement of an engineered cover on the WRSA and TMF at the final closure stage of the Project for the MacLellan site. i. Assess the potential residual effects on water quality parameters with CCME water quality guidelines for the protection of aquatic life, including nickel and selenium. ii. Describe the methodology used to conduct the alternative means assessment, including what guidelines and policies were followed to conduct the alternative means assessment. iii. Identify the preferred option for mine waste disposal and the associated rationale.
IAAC-107	ECCC-11	6.2.2 Changes to groundwater and surface water 6.3 Predicted effects on valued components 6.3.1 Fish and fish habitat	Volume 5, Appendix F Lake Gold Project, Hydrogeology Assessment – Gordon Site Technical Modelling Report Tables 5-2, 5-4, 5-7 and 5-9 Appendix G Lynn Lake Gold Project, Hydrogeology	The EIS Guidelines require that changes to groundwater and surface water as a result of the Project be predicted, including changes to groundwater and surface water quality, and that interconnections between VCs, such as groundwater, surface water, and fish and fish habitat be described. The EIS evaluation of the movement of impacted groundwater toward surface water receivers/receptors (including groundwater travel times) is relevant to the assessment of surface water quality, as groundwater which interacts with surface water has the potential to affect surface water quality. EIS Volume 5, Appendices F and G, which detail the hydrogeology assessments for the Gordon and MacLellan sites, respectively, both include a number of prediction tables presenting groundwater travel times and predicted groundwater discharge rates. These tables all present minimum, mean, and maximum groundwater travel times. It is unclear which groundwater travel time metric(s) were used to identify surface and groundwater exceedances, and which informed the effects assessment,	a. Clarify and provide the following information for the groundwater travel time prediction tables presented in the hydrogeology assessments for the Gordon site (i.e., Tables 5-2, 5-4, 5-7 and 5-9; EIS Volume 5, Appendix F) and the MacLellan site (i.e., Tables 5-4, 5-8, 5-9, 5-12 and 5-13; EIS Volume 5, Appendix G): i. what potential scenarios would favour the minimum groundwater travel times over the mean and maximum travel times; ii. which groundwater travel time metric(s) (i.e., minimum, mean, or maximum) were used to identify surface and groundwater exceedances; and iii. the hydrostatic units through which the particles travel from source to surface water receptor. b. Describe whether and how the minimum groundwater travel times informed the effects assessment, mitigation measures, management, and monitoring,

			Assessment - MacLellan Site Technical Modelling Report Tables 5-4, 5-8, 5-9, 5-12 and 5-13	mitigation measures, management, and monitoring, with respect to surface and groundwater quality, and fish and fish habitat. Additional information and clarity is required on groundwater travel times to fully understand the effects of the Project on surface and groundwater quality, and fish and fish habitat.	with respect to surface and groundwater quality, and fish and fish habitat.
IAAC-108	IAAC	6.1.5 Groundwater and Surface Water 8.0 Follow-up and Monitoring Programs	8.4.3 Assessment of Change in Groundwater Quality 8.9 Follow-up and Monitoring 9.9 Follow-up and Monitoring 22.5.2.3 Environmental Effects Assessment 23.5.4 Groundwater Monitoring Plan 23.5.5 Surface Water Monitoring and Management Plan	The EIS Guidelines require that the EIS include the outline of a preliminary monitoring program, including description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required). The EIS outlines the generic groundwater and surface water monitoring plans and provides the TMF malfunction scenario and potential implications for groundwater and surface water. However, limited details were provided on the surface water and groundwater monitoring surrounding the TMF and MRSAs. During the post-closure period, seepage from MRSAs and TMF will percolate into groundwater and eventually reach the receiving surface water. As some contaminants may take decades to reach surface water where predictions are made, predictions of groundwater quality adjacent to the TMF should be validated or updated through monitoring. This information is needed to confirm long-term groundwater and surface water quality predictions downstream. Additional details are required around the TMF and MRSA monitoring programs during all phases of the Project, and during post-closure. This information is required to understand how the proponent will monitor potential impacts to surface water and groundwater quality which may have potential effects to areas of federal jurisdiction such as fish habitat and traditional land use by Indigenous Groups.	a. Provide predictions of groundwater quality near the TMF and WRSAs during all phases of the Project. b. Provide predictions of groundwater travel time from the MRSAs and TMF to potential down gradient monitoring locations. c. Describe the flow paths from the TMF and MRSA facilities to the receiving surface water including the depth of flow and various hydrostratigraphic units. i. Include the proportion of the seepage that is transmitted through overburden units versus bedrock units, and any differences in travels times. d. Provide preliminary monitoring plans for the TMF and MRSAs, including groundwater and surface water monitoring. i. Identify how monitoring will be used to validate predictions and inform model updates. ii. Describe how adaptive management will occur in response to monitoring.
IAAC-109	MCCN-20	4.3 Study strategy and methodology	8.2.1.1 Baseline Hydrogeological Study	The EIS Guidelines state that the proponent has the discretion to select the most appropriate methods to compile and present data, information, and analysis in the EIS as long as they are justifiable and replicable. All data, models and studies will be documented such that the analyses are transparent and reproducible. The EIS notes that both the Gordon and MacLellan site monitoring locations are located mostly within the PDAs for each site. It is unclear why the monitoring locations are concentrated within the PDAs, as opposed to an equitable distribution across the PDAs, LAAs, and RAAs. This monitoring scheme represents a potential data gap that may affect the ability to assess Project effects on groundwater quantity and quality. Selection of appropriate monitoring locations is important to properly characterize baseline conditions throughout the PDA, LAA, and RAA, and is therefore a key component of the effects assessment on groundwater.	a. Provide a rationale for the selection of monitoring locations, including an evidence-based rationale for the deficiency of monitoring locations within the respective LAAs and RAAs relative to the concentration of monitoring locations within the PDAs.
IAAC-110	NRCan-48	6.4 Mitigation measures	5.2.6 Geochemistry 8.4 Assessment of Residual Environmental	The EIS Guidelines require that changes to groundwater and surface water as a result of the Project be predicted, including changes to groundwater and surface water quality. Treatment of water from the collection ponds is a concern for a number of parameters at both Gordon and MacLellan sites.	a. Provide surface water and sediment quality modelling downstream of the Gordon and MacLellan sites using more conservative water quality estimates in the collection ponds (i.e., assuming that MDMER limits are reached in the collection pond). Modelling should extend downstream until effects are no

			Effects on Groundwater 20.1 Summary of Changes to the Environment, Potential Effects, Mitigation and Residual Effects Table 20A-1	During operations, the EIS indicates that metals are not expected to reach *Metal and Diamond Mining Effluent Regulations* (MDMER) limits in the collection ponds at both sites. Treatment of collection pond water will only be considered if the metals concentrations exceed the MDMER limits. Modelling of water quality and sediment quality using more conservative water quality estimates in the collection ponds would also allow the proponent to identify early adaptive management measures that could be applied in the case where MDMER limits in the collection ponds are reached. In addition, if MDMER limits in the collection ponds are not reached, there may still be cumulative effects in the downstream environment leading to exceedances downstream of the Project. Additional information regarding potential effects to the receiving environment downstream of the collection ponds should be provided given the potential risks to aquatic communities in the event that MDMER limits in the collection ponds are reached.	longer measurable. b. Using results of surface water and sediment modelling conducted in part a, identify associated ecological risks in the event that MDMER limits in the collection ponds are reached. i. If additional risks are identified, identify mitigation measures and describe the criteria and parameters that would trigger treatment measures. Identify follow-up and monitoring plans, and indicate how effects would be adaptively managed.
IAAC-111	NRCan-47 NRCan-49	6.4 Mitigation measures	5.2.6 Geochemistry 8.4 Assessment of Residual Environmental Effects on Groundwater 20.1 Summary of Changes to the Environment, Potential Effects, Mitigation and Residual Effects Table 20A-1	The EIS Guidelines require that changes to groundwater and surface water as a result of the Project be predicted, including changes to groundwater and surface water quality. Limited details are provided in the EIS on treatment for phosphorus and fluoride and when water from the collection ponds will be treated prior to discharge. At the Gordon Site, the mine will operate for approximately 6 years and a conclusion on significant effects to the aquatic ecosystem is absent. Phosphorus, an eutrophication agent, could range from 0.1 to 200 µg/L in closure. Fluoride is a contaminant of potential concern, and that may have chronic effects to fish and benthic invertebrates. For the MacLellan site, the magnitude of residual effects to surface water quality are characterized as low during construction, operation, and active closure because predicted changes in water quality either do not exceed modelled baseline + 20%, or do not exceed water quality guidelines (i.e., no parameters of potential concern were identified for the construction, operation, and active closure). It should be acknowledged that phosphorus is expected to be around 45 µg/L as far as Minton Lake which would lead to residual effects (eutrophication) of the receiving environment. It was noted that selenium in the collection ponds could reach values close to the 5 µg/L MDMER trigger for conducting fish gonad and tissue monitoring, but up to 6 and 8 µg/L during operation and closure at KeeB1 in the receiving environment. While these are localised areas, it remains that loadings may be high in KeeB1 for these two elements. Additional information on water treatment for the Gordon and MacLellan sites is required to understand the residual effects of the Project on water quality in the downstream receiving environment from the collection ponds.	a. Provide details of the best available treatment technology and techniques economically achievable for phosphorus, fluoride and selenium that will be used at both sites. i. Identify mitigation measures, and describe the criteria and parameters that would trigger treatment measures for phosphorous, fluoride and selenium.

Atmospheric Environment					
IAAC-112	IAAC MCCN-17 MCCN-85 SDFN -24	4.3 Study strategy and methodology 6.1.1 Atmospheric Environment	5.2.2 Air Quality and Greenhouse Gases 6.2.1.2 Air Quality 6.2.2.2 Air Quality 18.4.1.1 COPC Concentrations in Environmental Media Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report 3.3.2 Other Measurements 3.3.3 Summary of Baseline Ambient Air Quality Concentrations	The EIS Guidelines require that baseline data that has been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, including modelling methods and equations, will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. The EIS Guidelines require that all conclusions be substantiated and predictions be based on clearly stated assumptions, and that the proponent use best available information and methods and discretion to select the most appropriate methods to compile and present data, information, and analysis in the EIS as long as they are justifiable and replicable. The EIS indicates that the baseline concentrations of NO_2, CO, and SO_2 were based on analysis of ambient air monitoring data from the Fort Smith continuous monitoring station in the Northwest Territories. The EIS states that “the station is in a similarly remote area with low population density and with similar meteorological and topographical conditions” and “The Fort Smith station measured the lowest ambient concentrations compared to measurements from monitoring stations in Manitoba, except for the SO_2 concentrations, which were lowest at Winnipeg Ellen Street station”. The EIS should explain any assumptions, sources of error, and uncertainty in drawing the conclusions, and justify the selection of this monitoring station as representative of the baseline information in the Project’s LAA. The distance between the Project area, the monitoring station, and the possible sources of variations need to be discussed. Information is required to understand the accuracy and representativeness of baseline information, including a discussion of confidence and error, as well as assumptions made, to be able to understand the effects of the Project on the atmospheric environment as well as effects to other VCs such as human health.	a. Provide a clear explanation including a rationale for the criteria used for the selection of the Fort Smith continuous monitoring station in the Northwest Territories as to why it is representative of the baseline concentrations of NO_2, CO, and SO_2 in the Project LAA. i. Identify how the information was used to represent the conditions in the LAA, provide the margins of error and other relevant statistical information, such as confidence intervals and sources of error, and any assumptions that were made in the selection of this information as a representative baseline. b. Describe how the selection of the Fort Smith monitoring station impacts the assessment for the atmospheric environment, human health, and the assessment of potential impacts to Indigenous Groups.
IAAC-113	IAAC	6.1.1 Atmospheric Environment	6.2.1.2 Air Quality 6.2.2.2 Air Quality 6.5.1 Project Residual Effects Likely to Interact Cumulatively Volume 4, Appendix A Air Quality Baseline Technical Data Report 4.2 Field Data Collection 5.1 Key Considerations and Findings	The EIS Guidelines require sufficient detail of the Project setting and baseline conditions, including a description of the direct and indirect sources of air emissions, to identify Project effects to VCs and an analysis of those effects. The description presented in the EIS of existing direct and indirect sources of air emissions in the Project area is limited. The EIS provides baseline concentrations of NO_2, CO, and SO_2 (based on the Fort Smith continuous monitoring station), $PM_{2.5}$, PM_{10}, and dustfall. The EIS states that dust levels are attributed to things such as traffic on unpaved roads and human activities, and identifies that baseline information was biased by forest fires. Section 6.5.1 states that “Baseline ambient concentrations provided in Section 6.2 account for present (currently active) projects and activities that are sources of air emissions (i.e., residential, industrial, commercial, and natural environment) in the LAA”. No details are provided on the specific activities (use of PR 391 and unpaved roads, and types of human activities) and associated locations within the LAA/RAA of the sources of air emissions and it is not clear whether some sources are more significant contributors compared to others. More information is needed about the direct and indirect sources of baseline air emissions and how they were considered in the assessment of baseline for conditions for the LAA and RAA. This information is required to understand baseline conditions of the atmospheric environment.	a. Describe the residential, industrial, commercial, and natural environmental sources (direct and indirect) that were considered in the determination of the baseline for air emissions. Include specific activities (i.e., human activity types and the use of unpaved roads) and their associated locations in relation to the Project, and note whether sources are significant contributors to air emissions.

IAAC-114	ECCC-02 MCCN-89	6.1.1 Atmospheric Environment 6.5. Significance of residual effects	6.2.2.1 Climate and Meteorology Figure 6A-1 18.7.1 Significance of Project Residual Effects	The EIS Guidelines require the EIS to describe relevant meteorological information including typical wind speed and direction. The EIS notes the hourly wind data from 2015-2018: "Calm winds (<1 m/s or 3.6 kph) are not recorded at Lynn Lake Airport station." The Lynn Lake Airport climate station does show recorded hourly wind speed data of 0 km per hour in this period of record. Ambient air quality can depend strongly on wind conditions, such that in calm conditions with low wind speed and steady source emissions, concentrations of both gas and particulate phase pollutants may increase and potentially begin to exceed relevant air quality criteria or objectives. Atmospheric dispersion models can frequently predict highest concentrations of air pollutants during low wind speed conditions. It is critical to ensure such conditions are appropriately captured in atmospheric dispersion models in order to determine whether potential air quality effects from the Project were adequately described.	a. Verify and describe the accuracy of Figure 6A-1 (and associated text in Section 6.2.2.1) reporting that 0% of wind data is considered to be calm (<1 m/s). If it is verified the identified wind data is accurate, clarify how it was determined that 0% of wind data is considered calm. b. Indicate whether the correct wind data was appropriately captured in the atmospheric dispersion models used to determine changes to air quality. i. If incorrect data was used, update the atmospheric dispersion models with the appropriate wind data and subsequently, update the effects assessment for atmospheric environment. Describe any changes to the exceedances of criteria air contaminants (CACs) and contaminants of potential concern (COPCs) noted in the EIS and the timeframes for the anticipated exceedances.
IAAC-115	HC-01 IAAC Conformity Review (Round 2) CR-10	3.0 Project Description 3.2.3 Spatial and temporal boundaries 6.1 Project setting and baseline conditions 6.1.1 Atmospheric Environment 6.2.1 Changes to the atmospheric environment 6.3.4 Indigenous peoples	6.4.1.4 Project Residual Effects Tables 6-21 and 6-22 Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report, Appendix G Maps G-1 to G-25	The EIS Guidelines requires that the EIS identifies how the Project could affect VCs and an analysis of those effects. The scope of the Project is described in the EIS Guidelines and includes permanent and temporary linear infrastructure (i.e., road, railroad, pipelines, and power supply). It is unclear how the use of PR 391 and access roads to transport ore and concentrate were used/considered in the effects assessment for atmospheric environment. There could be an underestimate in air quality-health risks at receptor sites located within the 300 m boundary of these roadways, if it was not considered. In Table 6-21, the EIS indicates the predicted maximum concentrations of the following air contaminants along PR 391 from the Gordon site operation: NO_2, CO, SO_2, hydrogen cyanide, total suspended particulate (TSP), PM_{10}, $PM_{2.5}$, dustfall, and metals. The EIS does not indicate whether these concentrations refer to those within the identified Project Boundary (i.e., 300 m buffer along PR 391) or outside of it in adjacent areas. Predicted maximum concentrations of air contaminants along PR 391 from the MacLellan site operation are missing from Table 6-22 and the EIS. The EIS appears to exclude three identified receptor sites along PR 391 and adjacent areas within 300 m of the road, (EIS Volume 5, Appendix A, Appendix G, Maps G-1 to G-25). Given that public access will not be restricted along PR 391, it is unclear why predictions are not provided within the Project Boundary for PR 391. On Maps G-1 to G-25, five types of "Human Receptors" are identified, although the categories are not defined. Contour maps showing pollutant concentrations are only provided for the "baseline + operations" case. HC guidance encourages the inclusion of four assessment scenarios in the air quality assessment, namely: i) baseline; ii) Project alone; iii) baseline plus project; and iv) cumulative or future development, as appropriate. Without this information, the review of potential air quality-related health risks from the proposed Project cannot be completed; therefore, uncertainties surrounding air quality-related health risks remain.	a. Provide complete contour maps for air pollutant COPCs, including: i. predictions within the previously omitted buffer zones (i.e., 300 m) directly adjacent to PR 391; ii. separate maps for baseline, construction and operational phases of the Project, and cumulative or future development. Provide a rationale for excluding any Project phase; iii. contour lines for relevant standards (e.g., Canadian Ambient Air Quality Standards [CAAQS]); and iv. identifiers for all receptor sites, respectively, as was done for the assessment of noise and vibration (EIS Volume 5, Appendix C, Map 5). Clarify the difference between the five categories of human receptors on Maps G1 to G25 of EIS Volume 5 (e.g., residences, trapping areas, etc.). b. Provide a table with maximum predicted concentrations of CACs and COPCs at all identified receptor sites, and highlight those concentrations that exceed relevant standards (e.g., CAAQS).
IAAC-116	CCN-38 SDFN-28 SDFN-45	3.2.1 Changes to the environment 3.2.3 Spatial and temporal boundaries	6.0 Assessment of Potential Effects on The Atmospheric Environment Map 6-1	The EIS Guidelines require the EIS to consider the impacts of the Project on receptors, describe and justify spatial boundaries, and take into account the community knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous Groups, with ecological, technical, social, and cultural considerations. The EIS Guidelines require the identification of sites used by Indigenous Groups as permanent residences or on a seasonal/temporary basis, drinking and	a. Describe how Indigenous receptors were identified for the assessment of effects on atmospheric environment. b. Clarify how community knowledge, Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous Groups were considered

		6.1.9 Indigenous peoples 6.2.1 Changes to the atmospheric environment		recreational use water sources (permanent, seasonal, periodic, or temporary), sites of traditional foods and related activities, commercial and recreational activities. EIS Map 6-1 provides the receptor locations for the assessment of effects on atmospheric environment. The EIS describes the influence of engagement with Indigenous Groups on the assessment. However the EIS does not provide sufficient information in terms of the process used for the selection of receptor sites, and explaining how the selected receptor sites represent all sites that may be used by Indigenous Groups. The EIS needs to describe how the identified receptors relate to locations of importance and the potential adverse impacts to Section 35 Rights of the *Constitution Act*, 1982. The EIS needs to describe how Indigenous receptors were identified and how they relate to locations of importance in the exercise of Indigenous rights for the Indigenous Groups identified.	in the selection of representative sites and state any limitations in the selection of the receptor sites for the assessment. c. Provide rationale for the selection of trapping areas as the receptor locations, and clarify how these receptors were deemed to be applicable for all Indigenous Groups. d. Clarify, including a rationale, as to the determination that no sensitive receptors are within the Project Boundary. e. If additional receptors are identified through engagement, update the assessment of effects to the atmospheric environment to include them. Provide updated maps to depict any additional receptors that are identified during engagement activities.
IAAC-117	CCN-29 CCN-30 CCN-31 CCN-32 CCN-33 CCN-34 CCN-35 CCN-36 CCN-37 IAAC SDFN-34 SDFN-35 SDFN-36 SDFN-37 SDFN-38 SDFN-39 SDFN 40 SDFN-41 SDFN-42	3.2.1 Changes to the environment 3.2.3 Spatial and temporal boundaries 6.2.1 Changes to the atmospheric environment 5.0 Engagement With Indigenous Groups and Concerns Raised	6.1.4.1 Spatial Boundaries 6.4.1.4 Project Residual Effects	The EIS Guidelines require the EIS to consider the impacts of the Project on receptors, and justify dispersion modeling methods. The EIS Guidelines require the EIS to describe the spatial boundaries of each VC to be used in assessing the potential adverse environmental effects of the Project and provide a rationale for each boundary. Spatial boundaries must take into account the appropriate scale and spatial extent of potential environmental effects, community knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous Groups, including ecological, technical, social, and cultural considerations. The EIS Guidelines require the proponent to engage with Indigenous Groups on effects of changes to the environment. The EIS defines the Project Boundary for atmospheric environment as the "outline around the PDA at the Gordon and MacLellan sites with a buffer of 300 m". The EIS provided information on the exceedances of NO_2, TSP, and PM_{10}, including the approximate distances from the mine site Project boundaries, the number of days per year that the values are predicted for, the approximate extent of the exceedances (area of effect) as informed by modelling, and the number of sensitive receptors within the area of effect, which were identified as trapping areas. The EIS needs to consider the possibility that there are additional receptor locations (permanent and mobile) around the mine sites that are present during the times of the identified exceedances or for the duration of the Project lifespan to ensure impacts to receptors and Indigenous Groups are adequately assessed. Additional clarity is required on the conclusions drawn on the number and type of receptors impacted by exceedances were determined.	a. Describe how the spatial boundaries (PDA, LAA, and RAA) consider current or traditional land and resource use by Indigenous Groups, including ecological, technical, social, and cultural aspects. b. Considering the response to IAAC-116, describe the selection of receptor points for exceedances of NO_2, TSP, and PM_{10}. i. Describe limitations of using the selected receptors in conclusions on impacts from the exceedances. ii. Describe the rationale as to why the conclusion is that there are no sensitive receptors around the Project Boundary in areas of the identified exceedances for NO_2, CO, and SO_2. c. If additional receptors are identified and/or defined through engagement activities, describe the potential for exceedances at those receptor locations. Update the effects assessment for the relevant VCs (i.e., atmospheric environment, human health, Indigenous Peoples, etc.). Describe any additional mitigation measures and/or follow-up as required.
IAAC-118	CCN-27 SDFN-31 SDFN-44	6.2 Predicted changes to the physical environment 6.3.4 Indigenous peoples 6.4 Mitigation measures	6.4.1.2 Project Pathways	The EIS Guidelines require the EIS to provide technically and economically feasible mitigation measures as well as follow-up programs designed to verify the effectiveness of mitigation measures. The EIS Guidelines require the EIS to describe any changes to environmental quality including sensory environment and perceived changes to availability or quality of resources. The EIS Guidelines require any predicted changes to the environment as a result of the Project and all sensory and observable change indicators (e.g., smells, noise, and smoke) adopted as a result of traditional knowledge in relation to each VC be identified. The EIS did not include or consider odour in the assessment of Project activities and emissions as a potential sensory and observable change indicator. Odour can potentially impact the exercise of rights due to increased avoidance behavior and changes to preferred conditions of use.	a. Provide links between Project-specific emissions and their different potentials to contribute to odour. Assess the effects to VCs from odour. b. Identify how odour from Project emissions has the potential to contribute to the qualitative sensory disturbance to Indigenous Groups, including perceptions and avoidance behaviours in relation to a perceived negative impact on air quality. Describe the pathway of effects from sensory disturbance to impacts to rights, including the potential implication of avoidance behaviours.

				A clear description of the emissions and changes to the atmospheric environment as a result of Project odours is required to understand related effects to other VCs, such as human health and Indigenous Groups.	c. Provide mitigation measures to address potential adverse impacts of odours from Project-specific emissions and describe the associated follow-up to verify the effectiveness of mitigation measures.
IAAC-119	ECCC-03	3.2.2 Operation 6.2.1 Changes to the atmospheric environment 6.4 Mitigation measures	6.4.1.1 Analytical Assessment Techniques 6.4.1.2 Project Pathways 6.4.1.3 Mitigation Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report, Appendix C Table C-4 US EPA AP-42: 13.2.5 Industrial Wind Erosion	The EIS Guidelines require the EIS to describe the storage, handling and transport of materials, ore crushing and treatment processes, and potential contributions to atmospheric emissions. The EIS Guidelines require the EIS to describe changes in air quality including total suspended and fine particulates. The EIS Guidelines require technically and economically feasible mitigation measures to be presented. The emission factors for fugitive PM from wind erosion of stockpiles given in Table C-4 may have errors for units of friction velocity (should be m/s) and the multiplier for $PM_{2.5}$ (should be k3, not k2) as per US EPA AP-42: 13.2.5. It is possible that these errors may result in inaccurate estimates of fugitive PM. The EIS notes that “The crushing plant conveyors and the fine ore stockpile are fully covered and therefore, fugitive dust emissions from these areas are not expected.” Transition points in and out of covered areas can also be sources of fugitive PM emissions. Fugitive sources comprise a significant fraction of PM emissions from the Project and it is important to account for all fugitive sources as accurately as possible to assess the Project’s effects on local air quality. Additional information on fugitive PM sources and emissions, including how emissions were calculated, transition points, and mitigation measures, are required to understand the effects of the Project on the atmospheric environment and other VCs, such as human health.	a. Confirm that appropriate calculations were used (as described in the reference document, US EPA AP-42: 13.2.5) to estimate fugitive PM from wind erosion of stockpiles. Provide revised tables as needed. b. Verify and describe how all transition points in and out of covered areas (i.e., fine ore stockpile, crushing plant conveyors) are considered as sources for fugitive PM emissions in the predictions presented in the EIS. i. If any transition points were missing in the fugitive PM emissions predictions, provide updated predictions to include any missing transition points and update the effects assessment on the atmospheric environment. Update the effects assessment for other VCs (i.e., human health) as necessary. c. If additional sources of fugitive PM emissions are identified, describe any additional mitigation measures or design features (i.e., fine ore stockpile, crushing plant conveyors) to mitigate fugitive dust emissions.
IAAC-120	ECCC-07 IAAC	6.2.1 Changes to the atmospheric environment	6.4.2 GHG Emissions Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report 4.0 Project Air Emissions 5.0 Project GHG Emissions Appendix F	The EIS Guidelines require that predicted changes to the environment be considered in relation to each phase of the Project. The EIS Guidelines require the EIS to provide an estimate of the direct greenhouse gas (GHG) emissions associated with all phases of the Project as well as any mitigation measures proposed to minimize GHG emissions, presenting the information by individual pollutant and summarized in CO_2 equivalent per year. The EIS provides estimates for the construction and operation phases at the McLellan and Gordon sites (Tables 6-23 through 6-26). The EIS provides an estimate for the decommissioning phase as a fraction of the construction phase emissions for both sites stating that GHG emissions estimated for decommissioning represents 30% of the respective construction GHG emissions for the equipment used to build the on-site infrastructure. Section 1.2.2.1 of Appendix A in Volume 5 suggests that the decommissioning / closure phase spans “5-6 years of active closure at each site followed by approximately 10 years of post-closure monitoring and approximately 50+ years of pit flooding at each site”. Section 9.4.1 suggests, “The expected duration for post-closure is approximately 10 years. Pit filling is expected to take 11 years at the Gordon site and 21 years at the MacLellan site under average conditions.” It is unclear what timeframe the emissions estimates are referencing and what emissions would be generated during post closure and pit filling. The EIS does not provide the estimates of the emissions by individual pollutant as required by the EIS Guidelines. The EIS does not provide information on how it was determined that decommissioning phase emissions would be 30% of construction phase equipment emissions, including applicable timeframes and activities (equipment use, type, use durations, hauling away of infrastructure, or	a. Provide an estimate of the GHG emissions by individual pollutant for the decommissioning phase at both the MacLellan and Gordon sites. i. Provide information in a format and the same level of detail as was done for the construction and operation phases (including tables and a breakdown of activities and pollutants). ii. Provide a justification for the 30% estimate used to as a fraction of the construction GHG emissions. Consider applicable decommissioning timelines, equipment differences and types, as well as any other activities that would contribute to GHG emissions during this phase that would not be applicable during the construction phase. iii. Specify all the considerations incorporated into the analysis and calculation of emissions for the decommissioning phase. b. Using the information in part a, provide the total estimate of GHGs for the Project and present this total by individual pollutant.

				waste materials from the site) used to determine emission estimates for construction equipment and how decommissioning emissions would be directly comparable to construction emissions The decommissioning phase emissions need to be presented in the same level of detail as for the construction and operation phases, with the inclusion of additional tables (structured such as Tables 6-23 and 6-24) and the incorporation/addition of the decommissioning emissions into the total GHGs for the lifespan of the Project. This information is required to verify the GHG emissions estimates and understand the full Project effects to the atmospheric environment.	
IAAC-121	ECCC-09	1.4 Regulatory framework and the role of government 6.2.1 Changes to the atmospheric environment	6.4.1.2 Project Pathways	The EIS Guidelines require the EIS to identify regional, provincial and/or national objectives, standards, or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects. The EIS Guidelines indicate that technically and economically feasible mitigation measures be considered, and an explanation be provided if any were rejected. The EIS Guidelines indicate the EIS describe the standard mitigation practices, policies, and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. In addition, the EIS Guidelines require a description of any changes to the atmospheric environment as a result of the Project, including an estimate of the direct GHG emissions associated with all phases of the Project. The EIS provides an overview of the inclusion of Tier 3 engine standards into Project pathways and emissions. The EIS specifies that "The diesel generator complies with Tier 3 emission standards for off-road diesel engines." Tier 4 engines are currently available and will be mandated, in general, for electricity generating purposes starting in 2021 under the *Off-Road Compression-Ignition Engine Emission Regulations*. The Project location cannot be considered a "remote location" as defined in the proposed regulations because the Lynn Lake area is served by Manitoba Hydro's bulk power transmission grid and hence Tier 4 emissions standards would apply to the diesel generators destined to the site. Consideration of technically and economically feasible mitigation measures, given the regulatory context, for the Project's electricity generation activities at the Gordon site are needed to understand the full effects to the atmospheric environment.	a. Describe the regulatory context that will apply to the selection of Tier 3 and Tier 4 electricity generation engines for the Project. b. Describe and compare the emissions that would result from using Tier 3 or Tier 4 engines for electricity generation at the Gordon Site, and provide a rationale as to why Tier 3 engines have been used to calculate emissions. c. If Tier 4 engines are chosen, identify any changes to the effects assessment.
IAAC-122	ECCC-10	6.1.1 Atmospheric Environment 6.2.1 Changes to the atmospheric environment	6.4.1.2 Project Pathways 6.4.2 GHG Emissions	The EIS Guidelines require a description of any changes to the atmospheric environment as a result of the Project, including an estimate of the direct GHG emissions associated with all phases of the Project. The EIS Guidelines require a justification of all estimates and factors used in the analysis of effects and require the EIS to provide the methods and calculations used. The EIS presents emission estimates as aggregate emissions rates by emission source (Diesel Exhaust Emissions from Construction Off-Road Equipment, Diesel Exhaust Emissions from On-Highway Trucks and On-Road Vehicles, etc.), which were derived from the US EPA MOVES2014a model. No information about the individual vehicles and engines, including the diesel generators that would be used throughout the lifecycle of the Project for electricity generation at the Gordon Site, is provided. The EIS does not provide information on the volume of diesel required during the Project construction, operation, and decommissioning phases. Information on the types of operating vehicles and diesel generators, and the volume of fuel to be combusted, is necessary to be able to verify the GHG and air pollutant emission information presented in the EIS and the Project's assessment on contribution to GHG emissions.	a. Describe the equipment to be used on site and the associated emission estimates for all phases of the Project, including diesel generators (anticipated to be used for electricity generation at the Gordon Site) and individual vehicles and engine descriptions (engine type, engine make/model, model year, power rating, and fuel type). i. Provide the volume of diesel, and its specifications (i.e., sulphur content) to be used in the operation of diesel generators at the Gordon site during construction, operation, and decommissioning phases. ii. Provide assumptions with activity data (hours per day), the emissions factors referenced for the emissions estimates, and the methods used, along with the sample calculations.

IAAC-123	ECCC-04	4.3 Study strategy and methodology 6.4 Mitigation measures	6.4.1.3 Mitigation 6.10 Summary of Commitments Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report, Appendix C C.3.2 General Assumptions US EPA AP-42: 13.2.2 Unpaved Roads	The EIS Guidelines require technically and economically feasible mitigation measures to be presented, and any assumptions to be identified and justified. The EIS notes an assumption of 75% control efficiency for fugitive dust by watering unpaved roads twice per day. This control efficiency is at the high end of the range of control efficiency as a function of the moisture ratio as described in US EPA AP-42 Section 13.2.2. Use of this level of control efficiency within the proponent's air quality model implies that a 75% control efficiency will be maintained as a minimum throughout the lifetime of the Project, as opposed to an average throughout the lifetime of the Project. Additional information is required about the assumptions surrounding the control efficiency and the conservativeness of the assumptions to understand effects to the atmospheric environment and other VCs resulting from fugitive dust emissions.	a. Explain why a 75% control efficiency for fugitive dust from unpaved haul roads was used. b. Describe how a 75% control efficiency will be achieved and how its continued achievement will be ensured during the life of Project for when roads are not snow covered and any other uncertainties associated with this control efficiency. i. If a 75% control efficiency cannot be achieved continually throughout the life of the Project, provide a scenario for implementation that will realistically be achieved and update the air quality modelling accordingly. If needed, update the effects assessment to VCs, such as human health, with updated inputs from the air quality modelling and provide additional mitigation measures if necessary.
IAAC-124	CCN-08 CCN-28 SDFN-08 SDFN-32	6.3.4 Indigenous peoples 6.4 Mitigation measures 8.0 Follow-up and Monitoring Programs	2.8.1.1 Air Contaminants 6.4.1.3 Mitigation 6.10 Summary of Commitments	The EIS Guidelines require the EIS to provide technically and economically feasible mitigation measures as well as follow-up programs designed to verify the effectiveness of mitigation measures. The EIS Guidelines require the EIS to describe any changes to environmental quality including sensory environment and changes to availability or quality of resources. The EIS states that chemical dust suppressants may be applied instead of watering as they are more effective. These suppressants are also more expensive and there is an increased potential for effects on the environment. Therefore, dust suppressants would be applied if measured ambient PM concentrations are in exceedance of the Manitoba Ambient Air Quality Criteria (AAQC) and if an increase of watering is determined ineffective. The EIS provides examples of dust suppressants to be used such as chlorides, petroleum products, liquid polymer emulsions, and agglomerating chemicals, stating they are to be applied as per the manufacturer's recommendations to preclude unintended environmental effects. The EIS does not provide information on the potential consequences of the use of these chemicals. The EIS indicates environmental effects of the Project on air quality will be considered and mitigated, where appropriate. Additional information is required on the potential effects of dust suppression chemicals used on country foods and other plants harvested for subsistence or cultural purposes, and potential harvesters, including from perceived changes to resource quality, such as any perceived contamination of land and resources. Identify mitigation measures for these effects.	a. Evaluate the potential effects of the use of chemicals for dust suppression on the atmospheric environment and on other VCs (e.g., vegetation deposition). b. Evaluate the potential impacts of chemical dust suppressants to vegetation, lands, wildlife, water, and Indigenous peoples. Identify potential avoidance behaviours of land users that may result from perceived contamination/effects and impact an Indigenous Group's ability to exercise its rights (i.e., resource harvesters who would otherwise use the area in absence of chemical dust suppressant). c. Provide mitigation measures for utilizing dust suppression chemicals and mitigating potential environmental effects.
IAAC-125	ECCC-05 MCCN-18 MCCN-89	6.2.1 Changes to the atmospheric environment 6.4 Mitigation measures 6.5 Significance of residual effects	6.4.1.3 Mitigation 6.7.1 Significance of Project Residual Effects 18.7.1 Significance of Project Residual Effects	The EIS Guidelines require the EIS to provide technically and economically feasible mitigation measures and follow-up programs designed to verify effectiveness of mitigation measures with the goal of ensuring controls and defined action plans are in place in order to decrease the potential for environmental degradation during all phases of Project development. The EIS Guidelines require the EIS to provide a detailed analysis of the significance of the residual adverse environmental effects following the implementation of mitigation measures and that the proponent will, where possible, use relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment.	a. Describe how the significance determination of the effects assessment has considered the regulatory guideline exceedances for TSP, PM_{10}, and $PM_{2.5.}$ b. Confirm that the Air Quality Management Plan will include: i. Monitoring methods to enable comparison with appropriate air quality objectives or standards that require 24-hour averaging periods, to verify the effectiveness of mitigation measures. ii. Describe proposed location(s) for ongoing air quality monitoring within the Air Quality Management Plan.

		8.0 Follow-up and Monitoring Programs	Volume 5, Appendix A Air Quality Baseline Technical Data Report 6.0 Environmental Control and Management Procedures	The EIS predicts that maximum TSP and PM_{10} concentrations will be greater than the Manitoba AAQC outside the Project Boundary, a high magnitude effect, due primarily to fugitive emissions from both the Gordon Site and MacLellan sites. The EIS states that "Maximum predicted concentrations in the LAA are compared to the CAAQS in this context and do not imply compliance with the AAQC at the Project boundary. The maximum predicted concentrations are based on areas along and outside the Project boundary (i.e., locations where public access is not restricted)". The EIS concludes that residual effects on air quality are not significant. The EIS bases this conclusion, in part, on the proponent's commitment to implement an ambient air quality monitoring program to monitor ambient TSP, PM_{10}, and $PM_{2.5}$ concentrations during construction and operation which will be used to determine whether additional mitigation measures are needed to further reduce fugitive PM emissions. It is unclear how significance was determined in light of the definition provided in the EIS that "a significant residual adverse effect for air quality is one where the Project's air emissions degrade the quality of the ambient air such that the model predicted concentrations (combined with background) are likely to exceed applicable regulatory criteria for ambient air quality". In drawing conclusions on the significance of effects for particulate CAC and dustfall, broad commitments to implement monitoring is not sufficient for determining the significance of residual effects. The EIS notes that additional mitigation measures will be applied when TSP, PM_{10}, or $PM_{2.5}$ (as measured within the scope of the Air Quality Management Plan) exceeds Manitoba AAQC objectives. An adaptive Air Quality Management Plan, which is briefly outlined in the EIS, is important to mitigate the severity of effects on air quality by the Project since $PM_{2.5}$ is considered a non-threshold contaminant for health effects and CAAQS should not be regarded as "pollute-up-to" levels. Further details on the air quality management plan are required to ensure the Air Quality Management Plan is effective in mitigating local air quality concerns.	iii. Describe mitigation measures that will be applied to reduce maximum concentrations of TSP, PM_{10}, and $PM_{2.5}$. Describe when these mitigation measures would apply.
IAAC-126	ECCC-06 HC-02 MCCN-89	6.1.1 Atmospheric Environment 6.2.1 Changes to the atmospheric environment 6.4 Mitigation measures 6.5 Significance of residual effects 8.0 Follow-up and Monitoring Programs	6.7.1.1 Changes in Air Quality Tables 6-10, 6-21 and 6-22 18.7.1 Significance of Project Residual Effects Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report 8.0 Dispersion Model Results Appendix G Map G-5 Appendix H Lynn Lake Gold Project, Human Health and	The EIS Guidelines require the EIS to provide technically and economically feasible mitigation measures as well as follow-up programs designed to verify effectiveness of mitigation measures. The proponent recommends monitoring TSP, PM_{10}, $PM_{2.5}$, and meteorological variables within the scope of the Air Quality Management Plan but does not include any gaseous CAC monitoring within this plan. Through atmospheric dispersion modelling, the proponent predicts possible exceedances of 1-hour NO_2 CAAQS at human receptor sites, as indicated in Tables 6-21 and 6-22. The proponent estimates baseline 1-hour NO_2 concentrations of approximately 7.5 µg/m^3 (Table 6-10), and that the maximum predicted 1-hour NO_2 in the community of Lynn Lake is between approximately 40-60 µg/m3 (EIS Volume 5, Map G-5). While it is recognized that these concentration maxima are likely infrequent, there is no NO_2 monitoring proposed in the Air Quality Management Plan to verify EIS predictions and adjust mitigation strategies if required. The EIS predicts NO_2 concentrations that exceed the CAAQS 1-hour standard for NO_2 at a number of receptor sites. CAAQS may also be used as points of reference to evaluate mitigation measures that may be required to maintain good air quality or to prevent exceedance of the CAAQS. The CAAQS recognize that there is no population health threshold for human health effects from exposure to NO_2; therefore, guideline values should not be construed as limits to which "polluting up to" is allowed. Given that any increase in NO_2 exposure may result in an incremental population health risk, to the extent feasible, reducing human exposure to CACs associated with the Project is recommended. While a frequency analysis was undertaken to support the Human Health Risk Assessment's characterization of potential health risk, concerns remain because of the nature of NO_2 as a non-	a. Evaluate options for monitoring, management, and technically and economically feasible mitigation measures for the Project's predicted NO_2 emissions. i. Indicate which options the proponent commits to and provide supporting rationale. ii. Confirm that the Air Quality Management Plan will include NO_2 monitoring to enable comparison with appropriate standards (e.g., 1-hour CAAQS) and will incorporate mitigation measures to reduce potential NO_2 exceedances of 1-hour NO_2 CAAQS. b. Identify technically and economically feasible mitigation measures for reducing potential health effects associated with NO_2 exposure.

			Ecological Risk Assessment Technical Modelling Report 5.3.3 Inhalation Ambient Air Quality Criteria (CAC) 5.4.3 Human Health Risk via Inhalation 5.4.7 Summary	threshold substance, in combination with NO_2 exceedances. Given the predicted exceedances and the possibility that health effects may occur at any level of exposure, information is needed on how monitoring, mitigation, and management measures might be used to confirm predictions and keep NO_2 emissions below the CAAQS value.	
IAAC-127	CCN-131 MCCN-102 MCCN-103 SDFN-152	8.0 Follow-up and Monitoring Programs	23.5.7 Air Quality Management Plan 23.5.9 Greenhouse Gas Management Plan	The EIS Guidelines require that the follow-up and monitoring programs will include specific details, such as the parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, and reporting mechanisms. The EIS Guidelines also outline the list of elements that must be included and presented for follow-up programs, including an outline of ways that Indigenous Groups will be included in the development and implementation of the program. The EIS Guidelines require a description of the monitoring that is inclusive of Indigenous engagement and require that enough detail be provided for the monitoring to determine all interventions, regulatory instruments, characterization of the details of monitoring activities, production of monitoring reports, and sharing of information. EIS Chapter 23 presents the Air Quality Management Plan and Greenhouse Gas Management Plan. These follow-up and monitoring programs do not meet the specific requirements outlined in the EIS Guidelines. Additional information is required to understand the follow-up and monitoring activities proposed for the atmospheric environment and how Indigenous Groups will be involved in the development and implementation of these activities. This information is required to understand the residual effects of the Project on the atmospheric environment.	a. Describe the follow-up and monitoring programs, including the Air Quality Management Plan (consider responses to IAAC-125 and IAAC-126), and the Greenhouse Gas Management Plan, for the atmospheric environment. i. Include the parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, reporting mechanisms, regulatory instruments used, characterization of monitoring activities, production of monitoring reports, and sharing of information. ii. Provide details for the Air Quality Management Plan. iii. Provide details for the Greenhouse Gas Management Plan. iv. Identify how Indigenous Groups were and will be involved in the development, implementation, monitoring, and follow-up activities for the atmospheric environment.
IAAC-128	ECCC-08 IAAC	1.4 Regulatory framework and the role of government 6.1.1 Atmospheric Environment 6.2.1 Changes to the atmospheric environment 6.4 Mitigation measures	EIS Summary 6.1.1.2 Greenhouse Gases 6.4.1.3 Mitigation 6.4.2 GHG Emissions Volume 5, Appendix A Lynn Lake Gold Project, Air Quality Impact Assessment Technical Modelling Report	The EIS Guidelines require that the EIS identify any government policies, resource management plans, planning or study initiatives pertinent to the Project and/or EA and their implications as well as any regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects. The EIS Guidelines require the EIS to provide the current provincial/territorial/federal limits for GHG emissions targets and an estimate of the direct GHG emissions associated with all phases of the Project, including an assessment of the level of estimated emissions of GHGs compared to these targets. The EIS Guidelines require the EIS to specify the actions, works, minimal disturbance footprint techniques, best available technology (BAT), best management practices (BMPs), corrective measures or additions planned during the Project's various phases to eliminate or reduce the significance of adverse effects. The EIS Guidelines require that the EIS describe standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The EIS Guidelines require an explanation be provided if mitigation measures were considered and rejected. The EIS Guidelines also require that the EIS identify the extent to which technological innovations will help mitigate environmental effects.	a. Describe the technically and economically feasible mitigation measures considered for all phases (including decommissioning and closure) of the Project for all GHG emission sources attributed to the Project, including any technological innovations, BAT, and BMPs. i. Describe the mitigation measures in the context of regional, provincial and/or national objectives, standards or guidelines pertaining to current provincial/territorial/federal limits for GHG emission targets. ii. Describe what mitigation measures will be implemented and when. Provide the criteria/rationale (such as feasibility) that was used in determining which mitigation measures were appropriate. b. Considering the response to IAAC-127, describe the monitoring and follow-up that will be conducted under the Greenhouse Gas Management Plan, including how effectiveness of mitigation measures will be determined. Describe any proposed adaptive management and criteria for implementation.

			10.0 Summary and Conclusions	The EIS outlines mitigation measures in Section 6.4.1.3 related to Project design and BMP (i.e., reduction in idling, sulfur content in diesel fuel, and equipment repair). The EIS indicates that detailed Project designs and mitigation strategies are currently ongoing and measures will be "refined in consideration of environmental assessment approval conditions and permit stipulations which will be incorporated into final environmental management planning". However mitigation measures for the reduction of GHG emissions, overall, are not presented in the EIS. The EIS does not discuss the mitigation measures in the context of current provincial/territorial/federal limits for GHG emission targets, and objectives and does not include the consideration of technological innovations, such as implementation of lower emitting technologies, incorporation of efficient and emission-reducing practices (using hybrid, alternative fuel, or zero-emission mobile and stationary combustion equipment (diesel generators), and considering options to mitigate GHG emissions during the decommissioning phase. Additional information on the mitigation measures for GHG emissions from the Project are required to understand the potential effects to the atmospheric environment.	
IAAC-129	IAAC	6.2.1 Changes to the atmospheric environment	6.4.1.3 Mitigation 6.4.2 GHG Emissions Tables 6-23 to 6-26	The EIS Guidelines require proposed mitigation measures to minimize GHG emissions. Information presented in the EIS provides a broad outline of measures to minimize GHG emissions. Specific information is needed to determine how the optimization of infrastructure such as haul roads (to reduce transportation and haul distances), and the TMF will occur. Additional information is needed to determine how the BMPs outlined in Section 6.4.1.3 will mitigate or minimize GHG emissions, and which pollutants will be reduced through the BMPs and mitigation measures. This information is required to understand the residual effects on the atmospheric environment and in turn, understand impacts to other VCs.	a. Provide detailed mitigation measures associated with the optimization of infrastructure, such as haul roads and the TMF, to minimize GHG emissions. i. Describe how these mitigation measures and BMPs will minimize GHG emissions, and how individual pollutants would be mitigated or minimized.
IAAC-130	SDFN-43	2.4 Application of the precautionary approach 6.2 Predicted changes to the physical environment 6.2.1 Changes to the atmospheric environment 6.5 Significance of residual effects	6.4.3.2 Operation Table 6-27	The EIS Guidelines require that the EIS identify changes to the atmospheric environment in terms of air quality for individual pollutants and identify the magnitude and the significance of these changes, in addition to applying the precautionary approach. The EIS indicates that "The magnitude for change in air quality during operation is rated low to high (L/M/H) because the Project operation results in predicted ambient concentrations for the various substances of interest and averaging periods that are greater than 10% of baseline concentrations but less than 50% of the AAQC (L), greater than 50% of the AAQC (M) or greater than the AAQC (H)." The magnitude of residual effects was presented in a similar manner for all phases of the Project in Table 6-27. The EIS does not provide a description of how the magnitude of change, and the significance of these changes has been determined for each of the pollutants. The EIS does not provide enough information on how the residual effects assessment considered and incorporated individual parameters in the conclusion. More information is required to understand how changes to each of the corresponding pollutants in the EIS Guidelines (SO_x, NO_x, TSP, $PM_{2.5}$, PM_{10} and diesel particulates) were assessed in terms of magnitude and significance.	a. Describe how the assessment of magnitude and significance of change to air quality (L/M/H) considered the exceedances associated with individual pollutants for all Project phases. Provide disaggregated residual effects criteria applications for each air quality value to allow evaluation of the varying magnitude.

Noise and Vibration					
IAAC-131	HC-03 IAAC	3.2.3 Spatial and temporal boundaries 6.1.1 Atmospheric Environment	7.1.4.1 Spatial Boundaries 7.2.1.1 Methods Volume 4, Appendix D Acoustic Baseline Technical Data Report, Appendix A Volume 5, Appendix C Lynn Lake Gold Project, Noise and Vibration Impact Assessment Technical Modelling Report 4.1.1.1 Baseline Noise Survey Maps 1 and 2	The EIS Guidelines require the EIS to take into account the spatial boundaries in assessing the potential adverse environmental effects of the Project and provide a rationale and appropriate scale and spatial extent of potential environmental effects. The EIS Guidelines require the EIS to provide current ambient day-time and night-time noise and vibration levels at key receptor points (e.g., Indigenous Groups or communities) or priority areas as described by Indigenous Groups and the results of a baseline ambient noise survey information on typical sound sources, geographic extent and temporal variations. The EIS provides an explanation of the spatial boundaries and indicates that the LAA "is the area where Project-specific environmental effects on noise and vibration can be predicted or measured with a reasonable degree of accuracy and confidence". The EIS provides the baseline for the assessment of noise and vibration based on 3 monitoring stations and states that "Three locations (NM1, NM2, and NM3) were selected to monitor the existing noise level for five days. NM1 was at a cottage adjacent to Burge Lake, west of the MacLellan site (NM1). NM2 was located at a remote site south of the Gordon site. NM3 was within the Black Sturgeon Reserve. These locations are presented in the Acoustic Baseline TDR and associated Validation Report (Volume 4, Appendix D). Map 7-1 also shows the noise monitoring locations within the RAA". The baseline information presented does not provide sufficient detail or rationale to understand the baseline conditions and the potential impacts of noise and vibration along PR 391 that is included in the LAA. No monitoring station was placed along PR 391 and no information is presented on current noise levels based on current usage and traffic. Without this information, an accurate representation of existing noise and vibration along PR 391 cannot be depicted and the effects of noise and vibration cannot fully be understood.	a. Clarify whether traffic from public use of PR 391 is considered in describing baseline sound levels and provide the assessment of any incremental effects. b. Clarify how the baseline monitoring stations (NM1, NM2, and NM3) were selected. Include how these 3 stations were representative of: i. the baseline in the LAA and RAA for noise and vibration; and ii. the conditions for PR 391. If these stations are not representative of the conditions for PR 391, provide additional baseline data or information to depict the baseline conditions for noise and vibration along PR 391 within the LAA, including existing sources of noise such as traffic, and public use of the PR 391 for other activities (e.g., commercial traffic).
IAAC-132	HC-03 IAAC	3.1 Designated project 3.2.3 Spatial and temporal boundaries 6.1 Project setting and baseline conditions 6.1.1 Atmospheric Environment 6.2 Predicted changes to the physical environment 6.2.1 Changes to the atmospheric environment	7.1.4.1 Spatial Boundaries 7.3 Project Interactions with Noise and Vibration 7.4.1 Noise Maps 7-3 to 7-6 Tables 7-7 to 7-12 Volume 5, Appendix C Lynn Lake Gold Project, Noise and Vibration Impact Assessment Technical Modelling Report 2.1 Project Development Area (PDA) 5.1.2.6 PR 391	The EIS Guidelines require the EIS to describe spatial boundaries, including local and regional study areas (RSAs), with a rationale for each boundary including appropriate scale and spatial extent of potential environmental effects. The EIS Guidelines require the EIS to describe changes to the environment in relation to each phase of the Project and describe them in terms of the magnitude, geographic extent, duration, frequency and sensory and observable change indicators. The EIS provides an explanation of the spatial boundaries and describes the LAA as "the area where Project-specific environmental effects on noise and vibration can be predicted or measured with a reasonable degree of accuracy and confidence". The LAA includes PR 391 that connects the Gordon and MacLellan sites and will be used during the construction and operation phases of the Project. The EIS outlines the consideration of noise from PR 391 in Volume 5, Appendix C with conservative assumptions, but it is unclear how they were spatially incorporated into the assessment as evidenced by Maps 7-3 to 7-6 which only present noise contour maps for receptor sites along the access roads and around the open pit areas. No rationale is provided for excluding receptors along PR-391 from the maps, such as Receptors 81 and 104, for example. Modelling needs to be updated to include the full extent of potential impacts to noise levels along PR 391. Any construction/upgrades to PR 391, needs to be considered in the assessment as well. It is not clear whether potential effects from noise due to "ore and concentrate transportation" activities (i.e., large haul trucks and public use of PR 391), and Project-related effects on human health were considered in the assessment within the LAA during the construction, operation, and decommissioning phases. Additional information is required to understand how activities along PR 391 will effect noise and vibration to understand the effects of Project activities on this VC.	a. Clarify if the use of large haul trucks and their associated noise were evaluated in the noise assessment. Describe how the noise generated by hauling activities was considered spatially along the PR 391. b. Considering the response to Round 1, Package 1, IAAC-10, identify how construction/upgrades to PR 391 are considered in the noise assessment as part of the construction phase of the Project. If construction/upgrades to PR 391 are not considered, update the assessment to include this activity and note any changes to the effects assessment for noise and vibration. c. Provide contour mapping for sound levels along PR 391 within the LAA (comparable to existing contour Maps 7-3 to 7-6) for all phases of the Project and update Tables 7-8, 7-9, 7-11, and 7-12 identifying noise level changes to receptors with updated modelling information.

			5.1.3.4 PR 391 Maps 1 to 6		
IAAC-133	CCN-39 CCN-40 CCN-41 SDFN-46 SDFN-47 SDFN-49	3.2.1 Changes to the environment 3.2.3 Spatial and temporal boundaries 6.1.9 Indigenous peoples 6.2.1 Changes to the atmospheric environment	7.1.2.1 Indigenous Engagement 7.2.1.2 Overview 7.4.2.4 Project Residual Effects Construction Tables 7-7 to 7-11, 7-14 and 7-15	The EIS Guidelines require the EIS to provide current ambient day-time and night-time noise and vibration levels and assess changes in these levels at key receptor locations. The EIS Guidelines require the identification of sites used by Indigenous Groups as permanent residences or on a seasonal/temporary basis, drinking and recreational use water sources (permanent, seasonal, periodic, or temporary), sites of traditional foods and related activities, and commercial and recreational activities. The EIS Guidelines require that the EIS provide a rationale for each boundary, taking into account appropriate scale and spatial extent of potential environmental effects, community knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous Groups, including ecological, technical, social and cultural considerations, and engagement with Indigenous Groups on changes to the environment. EIS Table 7-3 outlines ambient noise levels based on 3 monitoring locations (NM1, NM2, NM3) and informs the ambient sound levels identified for receptors in Tables 7-4 and 7-5. The EIS provides a description of the receptor points and Tables 7-7 to 7-11 provide estimated changes to noise levels for those receptors. Tables 7-14 and 7-15 outline operational vibration effects on receptors. The EIS states that receptor selection was informed by "Indigenous communities and publicly available sources of traditional land use information" and that Indigenous receptors were selected early and represent "potential receptor locations". The EIS does not describe how noise and vibration was considered in relation to Indigenous rights and interests specifically. There is limited information on how potential Indigenous receptors were identified, how they relate to locations of importance in the exercise of Indigenous rights, and how they were representative of individual Indigenous Groups. First Nation traplines, trapper areas, and fishing camps are not inclusive of all rights-based activities. Clarity is required on how receptors were selected to represent all rights-based activities. The EIS does not describe how noise and vibration have the potential to contribute to sensory disturbances and avoidance behaviours. The EIS identifies the residual effect of construction noise from equipment to be unlikely based on receptors more than 1 km away from both Gordon and MacLellan sites. Table 7-13 summarizes the predicted vibration level for annoyance effect at the closest receptor for these sites. An explanation as to why no receptors were selected in closer proximity to the Project area than 1 km, is missing. If the area surrounding the Project is unoccupied Crown land or land Indigenous Groups have a right of access, then rights have the potential to be exercised. Information on the rationale for receptors for the assessment is required. Additional information on how Indigenous rights and interests are affected by Project noise and vibration is required to understand the impacts to Indigenous Groups.	a. Clarify how the ambient noise levels based on the 3 monitoring locations (NM1, NM2, and NM3) and the individual receptor points in Tables 7-4 to 7-15 were selected and describe how they are representative of all rights-based activities for individual Indigenous Groups. If additional receptors representative of rights-based activities for individual Indigenous Groups are identified, provide an updated effects assessment for noise and vibration which includes these Indigenous receptors (i.e., seasonal cabins, residences, gathering and cultural sites/areas) that may be impacted. b. Explain how the receptor locations that would be potentially effected by construction activities were determined, including why there are no receptors within 1 km. c. If additional receptors are identified through engagement, update the assessment of effects for noise and vibration to include them. Provide tables that describe the changes to noise and vibration at these receptor locations.
IAAC-134	MCCN-19 SDFN-48	6.1.9 Indigenous peoples 6.2.1 Changes to the atmospheric environment	7.4.1.1 Analytical Assessment Techniques 7.4.1.4 Project Residual Effects	The EIS Guidelines require the EIS to assess changes in ambient day-time and night-time noise and vibration levels at key receptor locations and take into account community knowledge and Aboriginal traditional knowledge. The EIS provides a description of changes to noise levels at receptors in Tables 7-11 and 7-12 summarizing the percent highly annoyed values in comparison with Health Canada Noise Guidance	a. Clarify how noise from blasting has been defined and the differences between air overpressure and sound events. Indicate the differences in potential to contribute to noise levels. b. Assess the noise from blasting and include a description of the methodology of the assessment.

		6.3.4 Indigenous peoples	Tables 7-11, 7-12, 7-14 and 7-15 Volume 5, Appendix C Lynn Lake Gold Project, Noise and Vibration Impact Assessment Technical Modelling Report 5.0 Model Approach	(Health Canada 2017). Tables 7-14 and 7-15 outline operational vibration effects on receptors, and Maps 7-5 and 7-6 provide contour mapping for noise effects during operation. The EIS indicates that air overpressure, measured in decibels (dBL) "is the additional pressure above normal atmospheric pressure that is generated from a blast" and feels "like a gust of wind" as often air overpressure is inaudible. The EIS states that "Air overpressure and sound are different phenomena although both are measured in the units of decibels. An event with an air overpressure value of 115 dBL, which may be inaudible due to the low frequency content, is entirely different from a sound event with the level of 115 dBL." It is not clear that the EIS specifically assesses the noise impacts of blasting. The noise assessment considered stationary equipment (pumps, motors, and crushers), mobile equipment (back-up alarms), and pile driving. Blasting has potential to cause noise impacts to Indigenous Groups through either nuisance or discomfort and since blasting is intermittent, it can result in a startle response and avoidance behaviors which can alter patterns of the exercise of rights. Noise from blasting must be considered, described and discussed in relation to Indigenous rights and impacts to receptors. Information and clarity is needed on how potential noise impacts of blasting have been considered in terms of the identified receptors and the changes to the auditory environment to better understand impacts of noise and vibration on other VCs.	c. Confirm there is the potential for blasting-generated noise that may impact receptors, including Indigenous receptors, taking into consideration the response to IAAC-133. i. Describe how receptors may be impacted by noise generated by blasting activities. ii. Describe how noise generated by blasting has the potential to cause nuisance, avoidance behavior, and startle responses to receptors.
IAAC-135	CCN-42 CCN-43 IAAC SDFN-50 SDFN-51	6.3.4 Indigenous peoples 6.4 Mitigation measures 8.0 Follow-up and Monitoring Programs	7.4.1.3 Mitigation 7.4.2.3 Mitigation 7.4.2.4 Project Residual Effects 7.9 Follow-up and Monitoring 23.5.8 Noise Monitoring Plan	The EIS Guidelines require the EIS to include technically and economically feasible mitigation measures that will be applied as part of standard practice regardless of location, as well as provide monitoring and follow-up programs designed to verify the effectiveness of mitigation measures. The EIS Guidelines require the EIS to describe any changes to the sensory environment including noise, lights, and visual landscape. The EIS does not provide information on specific measures that will be taken to ensure that blast reduction is effective which was mentioned as mitigation specifically for Receptor 76 and 73, the closest receptors to the Gordon site. The EIS does not provide enough information to understand how the lifting or relaxing of the blast charges will be determined with consideration of receptors and traditional use activities on the land (mobile and stationary). The EIS does not provide enough information to determine how monitoring will occur or how effectiveness of mitigation measures will be determined. Section 7.4.2.3 of the EIS notes blast charge reduction as a mitigation measure for noise and vibration, and specifies the reduction in explosive weights, however there is no explanation about how noise levels be reduced through this mitigation measure. The EIS states that to meet the HC target of 125 dBL at the permanent work camp, a blast charge reduction of 85 kg would be required, and further reductions will take place if monitoring indicates that the targets are exceeded. No details are provided around how monitoring and follow-up will be conducted to ensure that targets are met and maintained. It is also unclear if the same blast charge reduction would apply to maintaining the target level of 125 dBL in areas of unoccupied Crown land in the vicinity of the Project. The EIS suggests that a "A Vibration Monitoring Program is recommended at receptor IDs 73, 76, 85, 86, and the permanent work camp to measure the vibration air overpressure level during a blast event." No details for this program are provided in the EIS. Additionally, there is limited information on how traditional land use activities might be impacted outside of the selected receptor points and how the noise levels will be mitigated for potentially mobile receptors, including proposed measures that would inform or alert communities and	a. Clarify how the reduction of blast charges will reduce noise and vibration levels referencing the appropriate technical documents. Provide context for the selection of blast charges and reductions as a standard approach to mitigating noise and vibration impacts. b. Clarify whether the requirement for a reduction in blast charge is also necessary to achieve overpressure level of 125 dBL in areas of unoccupied Crown land in the vicinity of the Project. c. Provide mitigation measures or mechanisms considered for reducing noise and vibration impacts on traditional land use activities besides the receptors already considered in the assessment (i.e., mobile receptors such as land users). d. Describe measures that would serve to inform communities and land users of blasting or an anticipated blasting schedule ahead of time. e. Provide a plan that describes monitoring and follow-up for blasting and vibration. i. Describe the parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, reporting mechanisms, regulatory instruments used, characterization of monitoring activities, and production of monitoring reports, and sharing of information. ii. Include specific actions that will be taken to monitor noise and vibration impacts of blasting events and the effectiveness of blasting specific mitigation (i.e., charge reduction). iii. Describe the process for determining how and when it is safe to relax blast charge reductions. Describe the steps that will be taken to inform Indigenous Groups prior to any blast charge increases.

				traditional land users about blasts ahead of time, and give the option for avoidance of a certain area during blasting. It is unclear how Indigenous Groups will be involved in the development of the Vibration Monitoring Program, its implementation, and what steps will be taken to respond to instances where targets are surpassed. It is unclear how Indigenous Groups will be involved on an ongoing basis to ensure vibration air overpressure levels during blast events do not exceed acceptable levels, for instance the Ontario Ministry of Environment, Conservation, and Parks cautionary target of 120 dBL for areas of unoccupied Crown land. Additional information on mitigation measures to address adverse effects on noise and vibration and how they will be implemented is required to understand the residual effects of the Project on this VC.	
IAAC-136	CCN-131 HC-04 MCCN-102 MCCN-103 SDFN-152	6.4 Mitigation Measures 8.0 Follow-up and Monitoring Programs	7.1.2.1 Indigenous Engagement 7.4.1.3 Mitigation 7.4.2.3 Mitigation 7.9 Follow-up and Monitoring 23.5.8 Noise Monitoring Plan	The EIS Guidelines require the EIS to include technically and economically feasible mitigation measures as well as provide monitoring and follow-up programs. The EIS Guidelines require that these programs will include specific details, such as parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, reporting mechanisms, an outline of ways that Indigenous Groups will be included in the development and implementation of the programs, and a description of the monitoring that is inclusive of Indigenous engagement. Sufficient details are to be provided for monitoring to determine all interventions, regulatory instruments, characterization of the details of monitoring activities, production of monitoring reports and sharing of information. The EIS indicates that the Project's potential effect on noise and vibration are of particular interest to local residents, and that mitigation measures will be implemented by the proponent to reduce potential noise effects during construction and operation, as needed. The proposed approach supports the development of appropriate mechanisms to confirm predictions for the most affected receptor locations, and adapt to unanticipated issues that may arise from Project-related noise. However, the EIS does not provide sufficient detail to understand specific measures that will be taken and to determine the adequacy of these measures. For example, procedures and mechanisms are not described for the receipt of noise complaints during the construction, operation, and decommissioning phases of the Project. This information will is needed to understand unanticipated noise effects, associated mitigation, and if there are technical issues in achieving planned noise levels. Additional information on monitoring and follow-up is required to understand the residual effects of noise and vibration.	a. Provide details for the Noise Monitoring Plan. i. Describe the follow-up program. ii. Describe the parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, reporting mechanisms, regulatory instruments used, characterization of monitoring activities, and production of monitoring reports, and sharing of information. iii. Describe the monitoring plan for noise levels at key locations where human health and exercising of rights may be impacted, such as permanent or seasonal residences, to validate the assessment models and predictions. Describe how noise monitoring will inform proactive adaptive management prior to complaints. iv. Describe how noise complaints will be addressed, including what determinant(s) will be used to decide if there is a need for corrective action, what corrective actions will be used, what the timelines are for complaint resolution (e.g., within a specified number of days of receiving the complaint), and how the plan will be communicated to potentially impacted people in the RSA. v. Describe how Indigenous Groups will be involved in the development and implementation of the Noise Monitoring and Follow-up Plan.
Accidents and Malfunctions / Effects of the Environment on the Project					
IAAC-137	IAAC	6.6.1 Effects of potential accidents and malfunctions	22.5 Effects Assessment of Potential Accidents or Malfunctions	The EIS Guidelines state that the EIS will conduct an analysis of the risks of accidents and malfunctions taking into account the plausible worst case scenarios and effects of these scenarios. The assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form, and characteristics of the contaminants and other materials likely to be released. For some of the accident or malfunction scenarios identified, the EIS does not provide estimates for the material that would be released and notes that the estimates will be undertaken as part of detailed engineering design and contingency.	a. Identify and describe the worst-case scenario for each type of accident and malfunction scenario. Provide the quantity and rate of release of the contaminants and other materials for each worst-case scenario.

				The EIS provides worst-case scenarios for all identified types of accident and malfunction scenarios except for vehicle accidents. It is difficult to assess the environmental effects of accidents and malfunction scenarios or to determine whether adequate contingency planning has been completed when scenarios have not been identified or described with sufficient detail to allow a thorough assessment of the effects.	
IAAC-138	ECCC-37 IAAC MMF-21	6.1.2 Geology and geochemistry 6.1.3 Topography and soil 6.6.1 Effects of potential accidents or malfunctions 6.6.2 Effects of the environment on the project	5.2.1 Climate and Meteorology 5.2.5.1 Glacial and Post Glacial History 5.2.5.3 Terrain, Surficial Geology, and Permafrost 21.4.1 Climate and Climate Change 21.4.2 Geological Hazards Table 21-1 22.4.6 Open Pit Slope Failure 22.4.7 Ore, Overburden and Mine Rock Stockpiles/Storage Areas Slope Failure 22.5.4 Ore, Overburden, and Mine Rock Storage Area Slope Failure	The EIS Guidelines require the EIS to take into account how local conditions and natural hazards could adversely affect the Project and how this in turn could result in effects to the environment. The EIS Guidelines require the EIS to assess accident and malfunction scenarios resulting from the failure of certain works caused by human error or exceptional natural events (e.g., flooding, earthquake, forest fire). The EIS Guidelines require a consideration of the potential for thaw settlement and terrain instability associated with ground thawing and the landslides, slope erosion, and the potential for ground and rock instability and subsidence during and following Project activities. The EIS states that "The potential effects of extreme weather, including storms, precipitation, flooding/ice jams, and drought will be considered in project design and operation, including the selection of materials and equipment." Table 21-1 provides projections of climate variables to 2050 and the EIS indicates that the projections were obtained from a study that utilized multiple models and scenarios. It is not clear if the range of projections from the table and study have been considered in the proponent's evaluation of possible climate change effects on the Project, nor is it clear which scenario was used to derive the projections in the table. The EIS also provides projections for annual winter and summer temperature and precipitation, and the number of days ≥ or ≤ 30 degrees Celsius. In the text following Table 21-1 the EIS does not link these projections to drought and flood (which can be related to changes in extreme precipitation among other factors), which the proponent indicates are important considerations at the Project location with potential for adverse environmental effects. For example, there may be potentially adverse effects of a TMF or bridge infrastructure accident and malfunction as a result of extreme precipitation. The Project is located within the sporadic to discontinuous permafrost zone, where permafrost is typically found in 10 to 50% of the land area. Section 5.2.5.3 of the EIS notes that permafrost is present in approximately half of the area surrounding the Project. However, EIS Chapter 21 does not assess the effects of permafrost on the Project. A loss of permafrost could potentially alter the Project's environmental setting. The potential for permafrost to contribute to landslides, erosion, and subsidence need to be assessed in the context of slope failures and geotechnical risks. The EIS is missing an assessment of the thaw, settlement, and instabilities that may occur as a result of changes to permafrost. A follow-up and monitoring plan should be developed to ensure there is sufficient monitoring for any geotechnical risks such as slope stability, landslides, and changing permafrost or other conditions in the Project area to verify residual effects on VCs affected by these changing conditions. Additional information on how projected climate change scenarios were considered in the effects assessment is required to understand the effects of accident and malfunction scenarios and the effects of the environment on the Project.	In providing a response, refer to Round 1, Package 1, IAAC-23 and IAAC-24 for consideration of permafrost surrounding Project activities. a. Describe how projected climate changes, including those identified as important to the Project by the proponent (e.g., extreme precipitation events, PMF, drought) have been or will be considered or accommodated for in Project design for all Project phases. b. Assess the potential for extreme precipitation events and the potential effects to Project infrastructure (i.e., TMF as in IAAC-141 and bridge infrastructure). Describe any additional mitigation measures and/or follow-up, as required. c. Assess the potential effects of permafrost as a result of climate change effects (e.g., potential for thaw, settlement, and instability; changes to groundwater volume), on the Project. Describe the potential for slope failures and geotechnical risks as a result of permafrost changes. d. Provide and describe a follow-up and monitoring plan for the geotechnical risks such as slope stability, landslides, and changing permafrost or other related conditions (e.g., changes to groundwater volume) in the Project area.

IAAC-139	IAAC	6.6.1 Effects of potential accidents or malfunctions 6.6.2 Effects of the environment on the project	1.4.1.2 Provincial Requirements Table 1-3 21.4.1 Climate and Climate Change 21.4.3 Forest Fires 22.4.9 Fire/Explosions	The EIS Guidelines require the EIS to identify accidents and malfunctions as the failure of certain works caused by human error or exceptional natural events (including forest fire) and how this in turn could result in effects to the environment (e.g., extreme environmental conditions that can contribute to and/or complicate accident and malfunction events). Section 21.4.3.2 of the EIS assesses the implications of forest fires on Project infrastructure and effects such as delays in Project schedule and damages to Project components. The EIS states that the forest fires discussed "does not include fire that results from activities at the mine (e.g., from electrical equipment or careless smoking) and could spread to surrounding areas; the potential effects of those types of fires are assessed in the context of Project-related accidents and malfunctions in Chapter 22." EIS Chapter 22 provides an overview of the fire and explosion malfunction "due to vehicle or equipment accident or malfunction, uncontrolled explosion, smelter or kiln malfunction, or electrical accident." The EIS outlines that the Emergency Response and Spill Prevention and Contingency Plan fire prevention and management provisions "will reduce the likelihood of accidents and potential fires to as low a level as is reasonably practical". The EIS outlines the fire suppression systems that will be in place (water supplies, sprinklers, fire extinguishers and other firefighting equipment) and that employees will be trained in all aspects of fire prevention. Table 1-3 of the EIS states that a burn permit and travel permit may be required under the provincial *Wildfires Act* for open burn activities during wildfire season and to "allow continued operation of the project during Area Closure (as specified by Ministerial Order due to wildfire risk)". The EIS also states that a "cleared buffer will be maintained around critical mine infrastructure to impede the spread of fire from a facility fire to the surrounding woodlands and to protect the facilities from a wildfire". The EIS concludes that there are no potential adverse effects to VCs from this accident and malfunction scenario. A discussion of the effects of the proposed clearing activities that will utilize open burn techniques during wildfire seasons is not provided. The worst-case risks of forest fire scenarios that may contribute to and may be contributed to by open burn activities is needed. A discussion of how forest fire seasons were considered in the Project schedule where there is potential for Project activities to contribute to wildfire risks is needed. The EIS does not provide a discussion of how climate change, forest fires, and additional land clearing may contribute to the overall risks of fire for the duration of the Project, including the decommissioning and closure phase. The consideration of the factors of climate change and land clearing requirements as possible contributing factors to accident and malfunction scenarios, including a fulsome description of the future risks, the mitigations measures, and emergency response procedures is required.	a. Identify and describe Project activities that may contribute to wildfire risks during wildfires seasons or wildfire incidents. Describe how Project activities (i.e., fuel storage) and schedules considered the risks of wildfire. b. Describe the open burn techniques that will be used for land clearing activities during all phases of the Project and provide an assessment of the risks associated with conducting these techniques during wildfire season or incidents of wildfires within RAAs, LAAs, and the PDA. c. Should open burning be required outside of the PDA, describe how the proponent intends to notify local communities and Indigenous Groups. d. Describe how permits under *The Wildfires Act* may contribute to or minimize the risks associated with operation during wildfire seasons, or during incidents of wildfires. e. Describe how climate change factors and land clearing for the Project (including through open burn techniques) were assessed in the potential future risks of wildfires. Describe how the Project has potential to contribute to wildfire risks. f. Provide all applicable mitigation measures, emergency response procedures, or changes to Project operations that would be applied during wildfire seasons or incidents of wildfires.
IAAC-140	IAAC MMF-08	2.4 Application of the precautionary approach 6.6.1 Effects of potential accidents or malfunctions 8.0 Follow-up and Monitoring Programs	22.4.1 Tailings Management Facility Malfunction 22.5.1 Tailings Management Facility Malfunction 22.5.2.3 Environmental Effects Assessment	The EIS Guidelines require preliminary monitoring programs to be provided, including a description of the characteristics. The EIS Guidelines require the EIS to consider the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form, and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction event. The EIS Guidelines require the EIS to describe the preventative measures and design safeguards that have been established to protect against such occurrences, and requires the precautionary approach be applied and plausible worst case scenarios to be presented. The EIS states that "while the potential consequences associated with a failure of TMF dams during operation were classified as "High" by Golder (2019), the likelihood and overall risks associated with the TMF during construction and operation have been classified as low in recognition of contingency planning and the implementation of engineering and quality controls during the design, construction, and operational phases to mitigate these risks". The malfunction scenario presented relates to	a. Describe the accident and malfunction scenario (including worst-case scenario) for the uncontrolled seepage of tailings from the TMF, including the potential and risk associated with improper construction, installation, or damage to the TMF liners or other safeguards/features that would contribute to the scenario. i. Describe the risk for adverse effects to VCs where there is potential for long timeframes associated with Project modifications used to address an accident/malfunction and resolution of the accident or malfunction. Provide a worst-case scenario for the malfunction that would not lend itself to a timely resolution. ii. Provide an assessment of the potential risks to other VCs for this accident/malfunction scenario.

				improper construction, installation, and damage to the dam liner that could result in excess seepage, "overwhelming the downstream sumps and causing uncontrolled discharge to the environment". With the consideration of the worst-case scenario, more information is needed to understand the potential malfunction that involves the uncontrolled or unanticipated seepage of TMF tailings. The malfunction scenario must consider the level of risk and response that would be required to address uncontrolled or unanticipated seepage from the TMF. For example, include discussion in the assessment about rectifying the issue of excess seepage and associated Project modifications. Consider the effect of this malfunction and levels of seepage higher than predicted and the potential to affect other VCs. Clarity is required around emergency response procedures (as per IAAC-142) that will occur and groundwater monitoring seepage detection mechanisms (as per IAAC-104) present to understand the residual effects for this type of accident/malfunction scenario.	iii. Describe all steps that would be taken if an accident or malfunction of this nature was to occur and how contingency planning and emergency response would account for the worst plausible situation. b. Describe the follow-up and monitoring plan and the triggers that would initiate an emergency response. Discuss the monitoring that would enable the detection of uncontrolled, unanticipated and/or excess seepage of tailings from the TMF into surrounding groundwater environments in the context of IAAC-104.
IAAC-141	ECCC-37 IAAC MCCN-37 MCCN-38 MCCN-97 MCCN-98	2.4 Application of the precautionary approach 4.3 Study strategy and methodology 6.6.1 Effects of potential accidents or malfunctions 6.6.2 Effects of the environment on the project	9.4.1.2 Project Pathways 21.4.1.2 Potential Effects of Climate and Climate Change on the Project 21.4.1.3 Mitigation 22.4.1 Tailings Management Facility Malfunction 22.5.1 Tailings Management Facility Malfunction Probable maximum precipitation and climate change; Kunkel, Karl, Easterling, Redmond, Young, Yin and Hennon (2013)	The EIS Guidelines require the EIS to consider the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form, and characteristics of the contaminants and other materials likely to be released into the environment during the events. The EIS Guidelines require the EIS to describe preventative measures and design safeguards that have been established to protect against such occurrences. The EIS Guidelines require the precautionary approach be applied and plausible worst-case scenarios presented. The EIS Guidelines require the EIS to take into account how local conditions and natural hazards could adversely affect the Project and how this in turn could result in effects to the environment. The EIS presents the accident and malfunction scenario of the TMF failure and indicates that effects of extreme weather will be considered in the Project design and operation and for the closure/passive care phase. The EIS also states that the "TMF is designed to contain 100-year, 24-hour rainfall event without discharge to the environment." Design values (e.g., 1:100 year flood, Probable Maximum Flood) that are estimated based on historical records, do not account for ongoing climate change. Probable Maximum Precipitation is projected to increase in the future with continued anthropogenic warming (Kunkel et al, 2013). The EIS states that the TMF will have an emergency spillway and contact water collection ditches to allow safe routing of flows from precipitation to prevent dam overtopping and states that the "accumulation of water in the TMF was modelled assuming average annual precipitation conditions over the life of the mine". The EIS indicates that an "emergency spillway will be raised progressively to correspond with raising of the TMF dams to avoid dam overtopping". The EIS also states that "the likelihood of a potential dam breach will be calculated during final design of the TMF". A preliminary assessment of the likelihood of a potential TMF dam breach and accompanying rationale for this estimation is missing. It is unclear how ongoing climate change and the potential for extreme precipitation were considered in the selection of the projected Probable Maximum Precipitation scenario and worst-case scenario assessment. It is unclear how extreme precipitation was considered in the design of the TMF considering modelling of "average annual precipitation conditions over the life of the mine" was conducted. The EIS does not provide sufficient information on the use and functions of the spillway and does not outline the scenarios for its use in an accident and malfunction situation or in the scenario of extreme precipitation (or both if one is a function of the other). The EIS does not indicate where the spilled TMF water will be routed to in the event of a flooding event. The consequent potential effects on VCs and Indigenous rights and interests are not discussed and are therefore not known.	a. Provide an assessment of the likelihood of a potential TMF dam breach and the rationale for the estimation. b. Describe how projected climate changes and scenarios (e.g., extreme precipitation events, probable maximum flood, drought) have been or will be considered or accommodated for in Project design of the TMF, the emergency spillway, and contact water collection ditches (see related information request Round 1, Package 1, IAAC-14) for all phases of the Project. i. Include a rationale for the scenarios assessed (i.e., 100 year, 24 hour rainfall event). ii. Describe any additional mitigation measures and/or follow-up, as required. c. Describe the conditions under which the emergency spillway as a component of the TMF facility will be used and describe where the TMF water will be routed to in the event of extreme precipitation/accident and malfunction. d. Provide an assessment of potential effects on VCs and impacts to Indigenous rights and interests resulting from the spilling of excess TMF water in the event of an extreme precipitation event and/or accident and malfunction scenario.

				Additional information is required on the design of the TMF with regards to changing weather conditions due to climate change to understand the effects of accidents and malfunctions on the environment due to the Project.	
IAAC-142	ECCC-39 MCCN-101	6.6.1 Effects of potential accidents or malfunctions	22.5 Effects Assessment of Potential Accidents or Malfunctions	The EIS Guidelines require the EIS to identify preliminary emergency response measures, capacities for contingency and emergency response, and procedures that would be put in place if accidents and malfunctions occur. The EIS indicates that stakeholders will be notified in the event of an emergency. The EIS presents preliminary emergency response measures for those accident and malfunction scenarios assessed for effects (TMF malfunction; release of untreated contact water; fuel and hazardous materials spill; ore, overburden, and MRSA slope failure; vehicle accidents). The EIS does not identify the means of communication or communication procedures to undertake notification. The plan needs to clearly describe how the proponent will provide information, including reporting on the extent of the damage or incident, and follow-up activities to surrounding communities likely impacted by an emergency incident. For all accident and malfunctions scenarios presented, the EIS needs to present a path forward for communicating significant emergency incidents. Specificity regarding which scenarios the emergencies communications plan will and will not address (i.e., a localized vehicular accident without spills) and what the emergency procedures will be for those scenarios is needed. This information is required to understand the residual effects presented by accident and malfunction scenarios.	a. For each accident and malfunction scenario, provide specific emergency response measures, capacities, contingencies, and emergency response procedures that are planned. Provide specificity and clarity about how each malfunction or accident will be addressed (i.e., in a step-wise process). b. Provide and describe an emergencies communications plan. i. Define the types of possible events, such as an event deemed significant, an event that is deemed an emergency, and an event that is deemed both significant and an emergency. ii. Describe the means of communication and urgent notification procedures that would be followed in an emergency event. iii. Describe the emergency communication measures that will be in place for Indigenous Groups. iv. Describe how environmental damage will be reported and how follow-up will be conducted regarding accidents and malfunctions, including with Indigenous Groups. v. Outline emergency communication procedures for both urgent immediate actions (such as public notification of safety issues, shelter-in-place and evacuation directions), as well as longer term actions (such as general website and hotlines, incident status updates, injured wildlife reporting, etc.).
IAAC-143	CCN-131 MCCN-101 MCCN-102 SDFN-152	2.4 Application of the precautionary approach 6.6.1 Effects of potential accidents or malfunctions 8.0 Follow-up and Monitoring Programs	23.5.1 Emergency Response and Spill Prevention and Contingency Plan 23.5.10 Explosives Management Plan 23.5.13 Erosion and Sediment Control Plan	The EIS Guidelines require that the follow-up and monitoring programs will include specific details, such as the parameters to be measured, the planned implementation timetable for follow-up studies, monitoring methods, and reporting mechanisms. The EIS Guidelines require the EIS to include an outline of the preliminary monitoring program, including description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required), and an outline of ways that Indigenous Groups will be included in the development and implementation of the programs and plans. The EIS Guidelines require consideration of the magnitude of accidents and/or malfunctions, including the quantity, mechanism, rate, form, and characteristics of the contaminants and other materials likely to be released into the environment during the event. The EIS should describe the preventative measures and design safeguards that have been established to protect against such occurrences. The EIS Guidelines require the precautionary approach be applied and plausible worst-case scenarios presented. The EIS presents follow-up and monitoring plans that are applicable to accidents and malfunctions. Insufficient detail is provided in the EIS to understand the specific measures that would be undertaken in terms of monitoring (i.e., to detect or prevent an accident or malfunction) and follow-up (i.e., communicate information and response) in case of an accident and malfunction scenario. The following plans should be provided in the EIS: • Emergency Response and Spill Prevention and Contingency Plan, including response measures for potential spills of hydrocarbons, sodium cyanide, and ammonium nitrate to fish-bearing waterways (as per IAAC-144); and • Explosives Management Plan, including details to understand the residual effects related to explosives and accidents/malfunctions.	a. Provide details of the Emergency Response and Spill Prevention and Contingency Plan and the Explosives Management Plan, including: i. parameters to be measured, the planned implementation timetable for follow-up studies (if applicable), monitoring methods, and reporting mechanisms; ii. a description of the characteristics of the monitoring program, including location of interventions, planned protocols, schedule, and resources required; and iii. a description of how Indigenous Groups will be involved in the development and implementation of monitoring and follow-up activities. Describe how follow-up and monitoring outcomes will be communicated to Indigenous Groups.

				Include in the plans a description of how communication of summary reports and results of follow-up activities is to occur, including to Indigenous Groups. This information is required to understand the specific follow-up and monitoring activities proposed for monitoring potential accidents and malfunctions and post-incident follow-up to understand residual effects. This information is required to understand how Indigenous Groups will be involved in the development and implementation of follow-up and monitoring.	
IAAC-144	ECCC-38 Conformity Review ECCC-11	1.4 Regulatory framework and the role of government 6.6.1 Effects of potential accidents or malfunctions 8.0 Follow-Up and Monitoring Programs	1.4.2 Other Environmental Regulatory Requirements Table 1-5 2.2.1 Design Standards and Codes 2.7.3 Operation 22.4.3 Ore Milling and Processing Plant Accident or Malfunction 22.4.5 Fuel and Hazardous Materials Spill 22.5.3.3 Environmental Effects Assessment	The EIS Guidelines require the EIS to identify regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects. The EIS Guidelines set out requirements for follow-up and monitoring programs that take into account the lifespan of all Project components and temporal phases. The EIS Guidelines require the EIS to identify the probability of potential accidents and malfunctions related to the Project and include an explanation of how those events were identified, potential consequences (including the environmental effects as defined in Section 5 of CEAA 2012), the plausible worst-case scenarios, and the effects of these scenarios. Considerations are to include fate and behaviour modelling of potential spills of hydrocarbons, sodium cyanide, and ammonium nitrate to fish-bearing waterways across all seasons. The EIS indicates that ammonium nitrate and fuel oil emulsion are planned to be used for blasting at both the Gordon and MacLellan sites. An explosives mixing plant and explosives storage (in both aboveground and underground magazines) will be located at the MacLellan site. The EIS indicates that “Spills of sodium cyanide or ammonium nitrate are considered to be less likely as these substances are transported in solid form and shipments are less frequent. As such, in the unlikely event of a spill of these solids, it would be expected that the spilled material could be cleaned up and removed from the spill site without entering a watercourse.” The EIS does not include the potential fate and effects of a spill of sodium cyanide and ammonium nitrate because they are transported in solid form, and therefore presumed to be less dangerous. However, sodium cyanide and ammonium nitrate can interact with incompatible materials to produce toxic gases. For example, an accidental release of sodium cyanide during a rainy period can release hydrogen cyanide and ammonium nitrate can interact inadvertently with acids from acid generating materials. The potential consequences of these scenarios need to be considered, including local and seasonal conditions, such as heavy rainfall or a fire event. The EIS also provides a description of the worst-case scenario for the Fuel and Hazardous Materials Spill and states that it would be a spill of petroleum hydrocarbons into the Hughes River at the Gordon site or the Keewatin River at the MacLellan site during winter and summer low flows. The EIS states that “Transportation of most fuels, reagents and combustibles will be by road, and there is a risk of a collision or roll-over leading to the spill of these transported materials”. Additional information is required to understand the environmental effects of malfunctions or accidents that may occur in this scenario. The EIS indicates that Project activities will be aligned with the International Cyanide Management Code but does not indicate that a cyanide management plan will be included as part of emergency response procedures, nor is it clear that the Project has an ammonium nitrate management plan or fuel management plan. The potential effects of malfunctions or accidents cannot be adequately understood without a description of mitigation measures for potential environmental consequences. This could be through emergency preparedness planning abilities and associated response capacities.	a. Provide the fate and behavior modelling of potential spills of hydrocarbons, sodium cyanide, and ammonium nitrate to fish-bearing waterways across all seasons. b. Describe the worst-case scenarios for sodium cyanide and ammonium nitrate spills in a similar level of detail and format as was provided for spill of petroleum hydrocarbons in the EIS. c. Provide the Cyanide Management Plan, Ammonium Nitrate Management Plan, and Fuel Management Plan which aim to prevent/minimize any release, discharge or spill to the environment, including applicable mitigation and management measures, principles, and standards of practice. i. Include information on manufacturing, mixing, transportation, handling, storage, use, emergency spill response measures, environmental monitoring, and facility decommissioning. ii. Describe how the effectiveness of the mitigation measures will be monitored and will incorporate appropriate water quality monitoring.

IAAC-145	MMF-14	6.6.2 Effects of the environment on the project	21.4 Assessment of the Effects of the Environment on the Project	The EIS Guidelines state that the EIS will discuss how local conditions and natural hazards could adversely affect the Project and result in effects to the environment. The EIS indicates that the edge of the open pit at the MacLellan site will be less than 100 m from the Keewatin River. Other Project infrastructure, such as the processing plant and the long-term ore stockpile, will be located close to the Keewatin River with little to no topographic barrier. This presents the risk of flooding impacting site infrastructure and potentially resulting in contamination of the downstream environment through floodwater interaction with the Project site. The EIS states that the Keewatin River is insensitive to flood magnitude due to large channel capacity, however information to validate this presumption is missing. Information on how effects from flooding will affect the Project and in turn the environment is required to understand the effects to VCs from these scenarios.	a. Provide a flood modelling study for the Keewatin River in proximity to the Project site to verify the flood risk on site. If a flood modelling study cannot be completed, provide a rationale and an evaluation of the risks of flooding on the Keewatin River water quality. i. The flood modelling study or evaluation of the risks of flooding on the Keewatin River needs to consider effects from rapid pit dewatering to prepare for flooding or after flooding occurs, and indicate where input from Indigenous Groups, including traditional knowledge regarding historic flooding in the area, was incorporated. ii. If the flood modelling indicates that the Project site is at a higher risk of flooding than is noted by the EIS, assess the impacts, determine if the conclusions change, and provide additional mitigation measures to reduce the risk of flooding to Project infrastructure and the risk to water quality in the Keewatin river as needed.

Attachment 2: Advice to the Proponent

Reference to EIS	**Context and Rationale**	**Advice to the Proponent**
EIS Summary, Section 5.4.2.2 EIS Volume 1, Section 6.4.1.3	The Project as proposed is not net-zero in terms of Greenhouse Gas (GHG) emissions and has not provided a strategy to support the Government of Canada's commitments to reduce GHG emissions and achieving net-zero emissions by 2050.	The Agency acknowledges that the proponent commits to implement GHG mitigation measures such as an anti-idling policy, regular maintenance, and optimized haul roads and infrastructure. Those GHG mitigation measures comply with the EIS Guidelines that were developed under the *Canadian Environmental Assessment Act*, *2012* (CEAA 2012). However, to support the Government of Canada's commitments to achieve net-zero GHG emissions by 2050, the Agency recommends that the proponent consider providing additional GHG mitigation measures. Such measures might include implementing lower emitting technologies and incorporating efficiency and emission-reducing practices such as using hybrid, alternative fuel, or zero-emission mobile and stationary combustion equipment (diesel generators), as well as considering options to mitigate GHG emissions during the decommissioning phase.