NIRB File No.: 08MN053
NWB File No.: 2AM-MRY1325
QIA File No.: LUA-2008-008
DFO File No.: 2008 MR

November 30, 2018

Megan Lord-Hoyle
Director, Sustainable Development
Baffinland Iron Mines Corporation
2275 Upper Middle Road East
Oakville, ON L6H 0C3

Sent via email: megan.lord-hoyle@baffinland.com

Re: Information Requests received from Parties regarding Baffinland Iron Mines Corp.'s "Phase 2 Development" Project Proposal

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Dear Megan Lord-Hoyle:

In addition to previous correspondence issued by the Nunavut Impact Review Board (NIRB or Board) on November 27th , 2018 on the topic of IR submissions for the "Phase 2 Development" project by Baffinland Iron Mines Corporation (Baffinland, or Proponent). The following IR submissions (Appendix A) have been reconsidered and included in the list of IR submissions requiring a response by the proponent. This table contains only the newly added or amended IR's and should be considered as an addition to the previously provided table.

- Government of Nunavut (GN)
- Parks Canada (PC)
- Health Canada (HC)
- Fisheries and Oceans Canada (DFO)

The Board previously asked Baffinland to review all submissions and supply the NIRB with an indication of an anticipated date for submission of its IR Response Package, on or before **December 3, 2018**.

If you have any questions regarding the NIRB's Review of the "Phase 2 Development" proposal, or the monitoring of the Mary River Project please contact Solomon Amuno, Technical Advisor II, at samuno@nirb.ca.

Sincerely,

Tara Arko
Director, Technical Services
Nunavut Impact Review Board

cc: Mary River Distribution List
Grant Goddard, Baffinland Iron Mine Corporation
Lou Kamermans, Baffinland Iron Mine Corporation
Karén Kharatyan, Nunavut Water Board
Assol Kubeisinova, Nunavut Water Board

Attachment: Appendix A: Information Requests Identified by the NIRB as Requiring a Response

APPENDIX A:
INFORMATION REQUESTS IDENTIFIED BY THE NIRB AS REQUIRING A RESPONSE

In the table below the NIRB has attempted to identify those Information Requests (IRs) which require response as part of this stage of the Review for the Phase 2 Development project proposal.

While the Proponent will not be explicitly required to address some of the following items within its IR Response Package, the NIRB strongly recommends that Baffinland thoroughly review each item and make its own determination regarding the need for or its ability to, provide an appropriate response. Where items are not addressed in the IR response package, it is expected that the issue is carried forward and addressed through the technical review period.

IR#	Issue	NIRB direction
Government of Nunavut (GN)		
GN-IR#1	The GN requests the Proponent provide the following information: 1. Clarification whether the collector lines will be overhead or buried. 2. Information on the design option(s) being considered for potential overhead collector lines including height above ground, number and diameter of lines, and design and spacing of support structures (i.e. towers, posts). 3. Additional information regarding estimated lengths of collector lines and access roads that will be required, including explanation of the apparent discrepancy between Table 1 and figure 2.1. 4. Clarification about whether collector lines will run parallel to the turbine access road and the Tote Road. 5. Clarification about whether the estimates of total length of collector line include the length of lines that may parallel the Tote Road. 6. Available information on range over which the turbines will be visible from surrounding land.	
GN-IR#2	The GN requests the Proponent provide the following information: 1. The proponent should summarize data on public use of the Tote Road since its construction up to the present, including summaries for data on public use collected via; (a) Baffinland's Hunter and Visitor Site Access Procedure; and (b) Incidental observations made	IR limited to Baffinland providing clarification on why public access of road has been considered in the previous assessments to date

	by Project personnel along the road. Please summarize the data by year and season. 2. Please provide an assessment of the potential for public access of the Tote Road during the Phase 2 project to increase and whether this could become an important pathway to future effects; providing references to any available evidence to support this. 3. Please provide an assessment on the effects of the potential hunting pressure increase on north Baffin caribou due to enhanced public access via the Tote Road.	
GN-IR#3	The GN requests the Proponent provide the following information: 1. In light of inconsistencies identified above, the Proponent should accurately confirm the schedule for construction and commissioning of the north railway, ore production increases and increases in truck traffic on the Tote Road. 2. The Proponent should identify if the production increase from 4.2 to 12 Mtpa (or from 6 to 12 Mtpa) is contingent on operation of the north railway. If construction and operation of the railway is delayed, will the scheduled increases in ore production and Tote Road trucking be similarly delayed such that the timing of these three components relative to one another remains the same as that proposed in the FEIS addendum? 3. What contingency plans have been considered for potential delays associated with railway construction and operation in terms of managing mine production levels, Tote Road traffic levels and environmental monitoring? 4. Considering the current schedule and potential for delays in north railway commissioning, what is the maximum period of time over which the Proponent would use the Tote Road (or part of the road up to km 57) for trucking at a rate of between 6 to12 Mtpa?	
GN-IR#4	The GN requests the Proponent provide the following information: 1. The Proponent should explain how increases in ore production rates of 25% and 160% relative to current levels will require 185% and	IR limited - item (4) Baffinland should clarify the variables and identify where documents will be revised as a result of all

	470% increases, respectively, in the number of trucking trips daily on the Tote Road. Supporting calculations would be useful. 2. The Proponent should clarify the discrepancy between Table 1-1 and Appendix C with respect to the haul traffic rate necessary to support a production rate of 12 Mtpa. 3. The Proponent should provide a definitive table summarizing Tote Road traffic rates for each phase of the Phase 2 Project with the duration of each phase identified (in years). Traffic rates should be presented as the estimated average number of vehicle transits (i.e. one-way trips) per day as well as the minimum and maximum daily rates that are planned or conceivably possible. Please include separate or pooled rates for haul trucks, operations, maintenance, freight/fuel hauling and construction activities. Where pooled rates are provided please indicate the type of traffic they include. For reference, please provide a similar table to that summarizing the current Tote Road traffic (2016-2017). 4. The Proponent should clarify whether the daily pattern of flow for traffic on the road will be characterized by a constant 24-hour flow or by distinct peaks and troughs. 5. The Proponent should clarify whether traffic flow will exhibit any planned or potential seasonal variation, describing and estimating any variation that exceeds the estimated average traffic rates by greater than “>” 20%. 6. The Proponent should revise all relevant Project documents to present a consistent description of the proposed ore transportation by the North Railway and trucking to ore transfer facility at km 57. 7. The Proponent should describe in detail the proposed ore transfer facility at km 57.	changes determined through tech review
GN-IR#5	The GN requests the Proponent provide the following information: 1. Please address the issues highlighted in the “Importance to Review and Supporting Rationale” section of this Information Request #5 regarding train traffic rates presented in	

	Table 1-1 and Appendix C including any inconsistencies. 2. Please provide a definitive table summarizing rail traffic rates for each phase of the Phase 2 Project with the duration of each phase identified (in years). Traffic rates should be presented as the estimated average number of train transits (i.e. one-way trips) per day as well as the minimum and maximum daily rates that are planned or conceivably possible. Please include separate or pooled rates for ore shipment, inspection/maintenance, snow management, freight/fuel hauling and construction activities. Where pooled rates are provided please indicate the type of traffic they include. 3. Please clarify whether the daily pattern of flow for traffic on the north railway will be characterized by a constant 24-hour flow or by distinct peaks and troughs. 4. Please clarify whether train traffic flow will exhibit any planned or potential seasonal variation (for example, increase traffic prior to marine shipping season); describing and estimating any variation that exceeds the estimated average traffic rates by >20%.	
GN-IR#6	The GN requests the Proponent provide the following information: 1. With respect to the Project Description: a. As discussed above, please clarify (with reference to document name, section and page number) where in the design plans for the north railway, slopes of 3H:1V and 1V:5H are presented and what proportion of the 110 km railway will have these gentler slopes. 2. With respect to slope and height data for the north railway embankments that was used in the caribou movement analysis (TSD 10; Section 3.3.2): a. The GN reviewer was unable to locate the Draft Line Plan and Longitudinal Section drawings in Appendix D that illustrate cut depth and fill heights for 20 m segments. Appendix D, attachment 6.7, contains line profile drawings that provide cut and fill data for 250 m segments of the railway. Clarify if attachment 6.7 was the	

	source of data used for the caribou permeability analysis. The cut and fill data presented in Appendix D does not appear to include data on embankment slope. Clarify if the slope was estimated "visually"? Please provide further explanation of this methodology. c. With the exception of caribou crossings at up to 11 locations, all the embankment cross section designs to be employed for construction of the north railway (Appendix D, Attachment 6.3) have slopes ratios greater than 1 in 2 (e.g., 1:2, 50%, 26.6° slope). This observation, alongside summary data presented in table 7-1 (Appendix D, attachment 6.3), seemingly suggests that almost the entire 110 km railway alignment will exceed the slope threshold used to identify sections of the rail line that could reduce movement of caribou. Please clarify whether this assertion is correct. d. The criteria used in the analysis to identify steep slopes that may pose barriers to caribou is stated as a slope ratio "greater than 1 in 2 (e.g., 1:2, 50%, 26.6° slope)". However, figure 1 (TSD 10; Section 3.3.2) indicates that a slope ratio of 2:1 was used as the threshold above which movement of caribou is reduced. Please clarify this discrepancy. e. Clarify if the fill heights data used in the caribou analysis are a measure of the height of embankments from grade (i.e. surrounding land) to the top of the rails themselves or something less. 3. To provide a quantitative overview of the railway's structure please provide 2 histograms summarizing the fill and cut data for all rail segments, respectively, that were used in caribou analysis. These should be presented using bins of 0-50 cm, 51-100cm, 101-150, 151-200cm, 201-250cm. Please provide similar histograms for the slope data derived from these railway plans using appropriate bins one of which should be 0-26.6. These histograms are also requested to support GN IR #51; allowing reviewers to understand how variation in the selection of height and slope criteria, within justifiable ranges, might influence the outcome	

	of the analysis conducted in TSD 10; Section3.3.2. 4. With respect to the grain size of quarry material used for covering embankment slopes: a. Please provide some discussion regarding the potential for grain size to influence the movement of caribou across the railway. Provide evidence that the proposed grain size (150 mm) is effective in facilitating caribou movements. Please reference any studies that have quantified variation in the permeability of roads or rails to caribou, dependent on grain size. 5. With respect to snow management: a. For snow management on the Tote Road, accumulated snow can be pushed off the road to flatten drifts and prevent formation of snow banks. Presumably, locomotives confined to rails will not be able to perform this activity. Explain how snow banks formed when locomotives plough snow will be graded flat. 6. Please provide predictions regarding expected snow bank heights along the railway, substantiating these with available evidence, accounting for the noted limitation of locomotives in managing snow and the level of success that has been achieved in maintaining snow bank heights below 100cm along the Tote Road.	
GN-IR#7	The GN requests the Proponent provide the following information: 1. Specifications for the proposed new landfill at the Milne port and a summary of planned explosive waste management. 2. Assessment of environmental effects from construction and operation of the new landfill.	
GN-IR#8	The GN requests the Proponent provide the following information: 1. Actual dust deposition monitoring results and their comparison with the modeling to prove there is no underestimation of deposition effects. Dust fall mitigation target/objectives must be clearly stated. 2. Clarification on whether or not the Proponent intends to comply with the new Canada wide NO2 air quality objectives and confirm that	

	NO2 dispersion does not cause significant effects in ambient air quality, based on the effect magnitude threshold set using the new NO2 air quality objectives. 3. Confirmation on if the 32% increase in emissions from the generators at Milne port has been included in the modeling and results provided in Figures D-4 and D-6. 4. Justification for selecting a threshold for Potential Acid Input.	
GN-IR#9	The GN requests the Proponent provide an updated Atmospheric Assessment to determine potential impacts to caribou and/or caribou habitat.	IR limited to providing additional discussion or clarification on topic
GN-IR#10	The GN requests the Proponent provide the most recent monitoring data, including dustfall, Nitrogen dioxide (NO2), Sulfur dioxide (SO2) and meteorology.	
GN-IR#11	The GN requests the Proponent incorporate all available relevant meteorological data in its modelling and updated results should be presented.	IR limited to data being provided and additional discussion on how this could adjust the previous model presented in the EIS Addendum
GN-IR#12	The GN requests the Proponent provide the following information: 1. Please update the assessment to incorporate fugitive emissions from the stock piles. 2. Provide a reference or evidence to support using 10m/s as a cutoff for entrainment from stockpiles. 3. A complete assessment incorporating particulate from the stockpiles is required.	IR limited to providing additional discussion or clarification on topic
GN-IR#14	The GN requests the Proponent updated tables in its response to include the maximum predicted modelled ground level concentrations within the LSA. If modelling is updated during this review (See Information Request #13; Predicted vs. Actual Air Quality conditions), provide the updated maximum predicted ground level concentrations.	IR limited to providing additional discussion or clarification on topic
GN-IR#15	The GN requests the Proponent incorporate an exceedance management plan into the Air Quality and Noise Abatement Management Plan detailing the measures that will be undertaken to	IR limited to additional detail or clarification being provided, the need for an additional plan would be

	manage and mitigate a potential threshold exceedance.	determined through the tech review process
GN-IR#16	The GN requests the Proponent provide support for the 66% fugitive emissions reduction factor used in the emissions estimation, particularly for periods during the year where water take locations will be frozen.	
GN-IR#17	The GN requests the Proponent provide the greenhouse gas emissions predictions and describe the reduction strategies that will be incorporated in Phase 2 development.	
GN-IR#18	The GN requests the Proponent provide the following information: 1. A comparison of the increase in phase 2 NOx predicted ground level concentrations to the 2020 CAAQS. 2. Provide information as to how NOx emissions reduction techniques or alternate power generation methods have been considered to meet the 2020 CAAQS.	
GN-IR#19	The GN requests the Proponent provide the following information: 1. Provide cumulative results of the mine site and travel on the Tote Road; or 2. Provide a justification for why these results should not be provided as a cumulative impact.	
GN-IR#21	The GN requests the Proponent provide references or data to support the choice of particulate matter densities employed in deposition modelling for the Milne Port, Mine site, and construction railway scenarios.	
GN-IR#22	The GN requests the Proponent provide the following information: 1. Provide an assessment of impacts from long term exposure to elevated airborne contaminants or provide a linkage to these assessments in Table 2.9. 2. Ensure that these assessments incorporate updated predictions if they have changed during the consideration of the IRs.	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process
GN-IR#23	The GN requests the Proponent provide the following information: 1. Describe the additional Quality Assurance/ Quality Control measures being implemented to ensure the testing is completed as planned. 2. Confirm each testing sample consists of two 12-hour periods for noise and two 10-hour periods for vibration.	

GN-IR#24	The GN requests the Proponent provide the following information: 1. Indicate whether construction and closure activities will be limited to the hours of 07:00 and 22:00 (daytime). 2. If activities will not be limited to the daytime period, please explain why.	
GN-IR#25	The GN requests the Proponent provide the following information: 1. Clarify how a predicted sound level of 50 dBA occurs 1,000 m from the transfer site, yet a lower sound level of 45 dBA occurs closer (630 m) to the site. 2. Clarify how a predicted sound level of 50 dBA occurs 350 m from the center of the road, yet a lower sound level of 45 dBA occurs closer (305 m) to the center of the road.	
GN-IR#26	The GN requests the Proponent provide the following information: 1. Please provide an explanation of why the requirement to meet 40 dBA Leq at 1.5 km in all directions from the Mine Site PDA, the Milne Port PDA and the HTO Cabin is not anticipated to be met. 2. Provide additional information or commentary as to the likelihood of a dwelling being constructed closer than the current HTO cabin. Provide information regarding the status of discussions with the Mittimatalik HTO members regarding relocating the HTO cabin outside the area of disturbance. 3. In the event that a dwelling is constructed within 1.5 km of any PDA or if the HTO cabin cannot be relocated, provide contingency measures that the Proponent would take to address these scenarios.	
GN-IR#27	The GN requests the Proponent provide the following information: 1. Supporting rationale for why a ground factor G=1.0 is appropriate for winter modeling conditions. 2. A sensitivity analysis to demonstrate that assessment conclusions would not change if a different ground attenuation factor was used for bodies of water such as Milne Inlet, Camp Lake or Sheardown Lake.	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process

GN-IR#30	The GN requests the Proponent provide the following information: 1. Provide the combined sound levels (facility contributions + assumed ambient) at the receptors shown in Table 5 for the Mine Site operations and at the receptors shown in Table 7 for the Milne Port operations. 2. Provide a comparison of the combined sound levels for each operation to the PSL and provide any required revisions to the conclusions shown in Sections 3.2.1.4 (Mine Site) and 3.2.2.4 (Milne Port).	
GN-IR#31	The GN requests the Proponent provide the following information: 1. Explain why a range of predicted sound levels is presented for the worker accommodation buildings at the Mine Site and Milne Port. 2. Confirm that the predicted sound levels for each worker accommodation building represent exterior sound levels or interior sound levels.	
GN-IR#32	The GN requests the Proponent to explain why a more robust worker accommodation building is planned for the Milne Port compared to the Mine Site and why upgrades to the worker accommodation building at the Mine Site to provide an equivalent NCB level are not planned.	
GN-IR#34	The GN requests the Proponent provide a figure similar to Figure 9 that presents predicted short-term sound levels during a train passby event versus the distance from the rail line.	
GN-IR#36	The GN requests the Proponent provide the following information: 1. Several sound sources in Tables B1 and B2 do not have 1/1 octave band sound power level data, but just an overall sound power value. Clarify whether a generic spectrum shape was assumed for these sound sources. If so, provide the generic spectrum shape used for all sound sources. If these sound sources were modeled as single band sources, indicate which single octave band was used to represent each sound source. 2. Explain why sound source “Mary River Steensby Train Knuckle Thump” is 1 decibel (dB) higher than sound source “Mary River Milne Train Knuckle Thump”.	

	3. Clarify whether the sound power level of 151 A-Weighted Decibel (dBA) for each "Mary River Powerhouse Generator – Exhaust" represent a silenced or unsilenced sound power level. 4. Explain why sound source "Milne – Lump Reclaimer/Stacker" has the same 1/1 octave band sound power level data as the "Milne Dozer (Caterpillar (CAT) D9) – Lump stockpile". This implies the Lump Reclaimer/Stacker is modeled as a dozer. If so, provide supporting rationale. 5. Explain why sound sources "Milne – Fines Stacker 1" to "Milne – Fines Stacker 4" have the same 1/1 octave band sound power level data as the "Milne Dozer (CAT D9) – Lump stockpile", This implies the Fines Stackers are modeled as a dozer. If so, provide supporting rationale. 6. All the conveyors at the Mine Site have the same overall sound power level of 96 dBA. Indicate if all the conveyors at the Mine Site are the same length. If they are not all the same length, indicate why the overall sound power level is identical. 7. All the conveyors at the Milne Port have the same overall sound power level of 93 dBA. Indicate if all the conveyors at the Milne Port are the same length. If they are not all the same length, indicate why the overall sound power level is identical.	
GN-IR#37	The GN requests the Proponent provide the following information: 1. Explain how truck traffic on the Tote Road was modeled, including the scenarios considered. 2. Provide the sound power level used for the Tote Road haul trucks. 3. Provide the volume of haul trucks modeled for each scenario.	
GN-IR#39	The GN requests the Proponent provide the following information: 1. The Proponent should explain why the noise contours drop off at this location along the roadway. 2. If necessary, the Proponent should revise any figures that are affected (e.g., Figures 1 and 2 in Appendix E).	IR limited to providing additional discussion or clarification on topic

GN-IR#40	The GN requests the Proponent provide the following information: 1. Clarify whether impacted PDA soil conditions will be revegetated to baseline conditions; 2. Clarify the existing soil and vegetation conditions within the PDA 3. Clarify the existing soil and vegetation conditions within the area of the highest TSP deposition (adjacent the PDA) after the mine closure. This should include an estimate of the total area of affected soils and vegetation that will not be returned to baseline conditions. 4. Discussion regarding vegetation reclamation experienced at older mines sites (e.g. Polaris).	
GN-IR#41	The GN requests the Proponent provide the following information: 1. The Proponent should conduct an analysis that incorporates the quantitative data from 2012- 2018 monitoring activities that assesses how the Approved Project effects are ranked based on the criteria in TSD 10; Table 7, page 59. For example, clarification as to whether or not the Approved Project has a level 1, 2, or 3 effect on caribou habitat. 2. The Proponent should provide rationale as to why the two additional parameters, (1) habitat loss and (2) health and mortality, mentioned above are no longer a concern for caribou.	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process
GN-IR#42	The GN requests the Proponent provide the following information: 1. An updated TEMMP that identifies the expected monitoring and mitigation updates for Phase 2. 2. If no additions are made, then Section 3.6 should identify specific reasons why the current monitoring and mitigation is sufficient for additional effects identified in this proposal.	IR limited to providing additional discussion or clarification on topic
GN-IR#43	The GN requests the Proponent provide an analysis of North Baffin Caribou baseline distribution and habitat use using available distribution data from pre 2009 and 2011-2018.	IR limited to providing additional discussion or clarification on topic
GN-IR#44	The GN requests the Proponent provide the following information: 1. The Proponent should revise the analysis on the effects related to caribou movement seasonally, including effects based on sex, and	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment

	incorporate maximum movement rates of caribou to identify all possible effects on caribou movement. 2. The Proponent should revise modelling of the barrier effect on caribou movement quantifying the barrier effect of a train speeding up, maintain required speed, maintaining speed limits identified in 3.4.1.3, slowing down, and seasonal variation in speeds.	would be determined through tech review process
GN-IR#45	The GN requests the Proponent provide the following information: 1. Provide quantitative data for the surveying of the railway proposed route that identifies the likelihood of encountering caribou along the Northern Railway route. 2. Provide supporting documentation for the effectiveness of seasonal shutdowns of roads and railways for mitigation caribou mortality. 3. Identify effects and proposed mitigation measures regarding all possible scenarios of caribou mortality, in addition to seasonal migration, including but not limited to caribou unwilling to leave the railway, or approaching a railway. 4. Provide clarification for the statement: "Additionally, the temporary increase in traffic in the Northern Transportation Corridor and the concomitant increase in mortality risk will be partially mitigated by the shorter-term transition to rail for transport of ore to Milne Inlet." (TSD 10; Section 3.4.1.3)	
GN-IR#46	The GN requests the Proponent provide the following information: 1. The Proponent should provide an itemized list of the assumptions of the energetics and demographic models identified in TSD Attachment 1. This list must include an indication if the assumption is guided by information specific to North Baffin Caribou, caribou literature and subsequent data or personal opinion. 2. The Proponent should provide a list of all data inputs and whether they are based on data for North Baffin Caribou, caribou literature and subsequent data or personal opinion.	IR limited to providing additional discussion or clarification on topic; any need for a new assessment would be determined through tech review process

GN-IR#47	The GN requests the Proponent provide the following information: 1. The Proponent should explain how studies of semi-domesticated reindeer are relevant to an assessment of wild, free-ranging Baffin Island caribou. Please also discuss the limitations of these studies for the purposes of assessing the Project. 2. The Proponent should provide, if available, references to literature containing studies of the responses of wild, free-ranging caribou to wind turbines and power lines. 3. The Proponent should explain how a conclusion of "no conceivable effect" is arrived at given the noted gaps in Project design information, limited Project-specific caribou data and lack of relevant literature.	
GN-IR#48	The GN requests the Proponent provide the following information: 1. With respect to the use of data on railway design to assess potential as a barrier to caribou movements the GN requests the following information: a. Explain how the different railway design cross-sections were considered in the caribou movement analysis (as noted above). Clarify if it was assumed that a 2 meter high, 83 degree rock face in a railway cut reduces caribou movement to the same degree as a 34 degree embankment (the slope indicated for virtually all the north railway embankment designs in the FEIS addendum). Also clarify what evidence exists that caribou will readily scale a 2m high near-vertical rock face. Explain how the analysis considered the double obstacles presented by railway segments where cuts in rock of 83 degree angle run alongside embankments typically 34 degree angle (i.e. type I and II cross-sections). b. Clarify if and how the caribou movement assessment considered the potential barrier presented by the Tote Road in-order to provide a complete assessment of the Northern Transportation Corridor's total (combined/cumulative) effect on caribou movement.	IR limited to providing additional discussion or clarification on topic; any need for a new assessment would be determined through tech review process

	c. Clarify if and how the caribou movement assessment considered the 7 combinations of potential barrier presented by embankments, cut rock faces and roads (i.e. embankment, cut, road, embankment + cut, embankment + cut + road, embankment + road, cut + road). 2. With respect to the stratification of the railway for scoring permeability to caribou, the GN requests that the Proponent: a. Provide a rationale for the idea that the presence of suitable crossing locations within 1 day's movement for the average caribou makes the rail permeable to movement. b. Explain the apparent inconsistency between the statement that 4 km "was approximately the average distance travelled by caribou in one day" and the estimates of daily movement rates reported in section 2.4.4 of the report (ranging from 1.3 to 2.8 km/day). c. Clarify what point of origin was used to divide the railway into 4 km segments and if this started with the Milne terminus representing kilometre zero. d. Clarify if the permeability criteria for scoring 4 km rail line segment considered both slope and height/depth. 3. Given the semi-qualitative nature of the assessment methods and reliance on professional judgement, the effects of applying alternate, plausible scoring systems and criteria should be explored. This 'sensitivity' analysis is particularly important where underlying assumptions in the assessment have a notable degree of uncertainty due to variance in available data or reliance on professional opinion. Confidence in the impact predictions would be improved by clearly understanding how uncertainty surrounding selection of appropriate scoring systems and criteria does or does not affect impact significance. The outcome of this analysis may also identify needs for effects monitoring programs should the Project proceed. Accordingly, the GN requests that the Proponent:	

	a. Present assessment results obtained when the following range of alternative scoring thresholds and criteria are applied to the available data following the same methodology used in the FEIS addendum: (i) Embankment and cut heights of greater than ">"1, 1.5, 2, 2.5 and 3 meters are used to classify 20m rail segments that may pose a barrier to caribou (per figure 1); (ii) Permeability to caribou is scored on the basis of 1.5, 3 and 4 km segments of the rail alignment; and (iii) Alternative permeability rating criteria are applied to these rail alignment segments. For example, where high permeability is less than or equal to "≤" 33% of rail alignment within 1.5km is estimated as likely not physical barrier threshold; medium is >33% and <67%; low is greater than or equal to "≥" 67%. b. Present assessment results obtained when an alternate methodology and scoring criteria are applied. Specifically, assuming the required data exist, the Proponent should redo the analysis to identify 20 m segments of the Northern Transportation Corridor that may pose a barrier to caribou using the following classification system: Where an obstacle with a slope of 83 degrees and height of >1.5 m, or a slope of 26.6 and > 2 m is created by a railway cut, rail embankment or road embankment, present a table summarizing the frequency and percentage of segments classified as potential barriers, based on this system. Provide separate results for the frequencies and percentage of segments where multiple potential barriers are presented by rail embankment only, rail cut wall only, road embankment only, rail embankment and cut wall, rail embankment and road embankment, rail cut wall and road embankment, rail embankment-cut wall-road embankment. c. Using the alternate methodology described above in item 2) apply alternative permeability rating criteria to these rail alignment segments. For example, where high permeability is less than or equal to "≤" 33% of rail alignment within 1.5km is estimated as likely not physical	

	barrier threshold; medium is >33% and <67%; low is greater than or equal to "≥" 67%. NOTE: This information request should be addressed in conjunction with GN IRs # 6 (*North Railway Design and Physical Structure*), 49 (*Railway as a barrier to known caribou trails*) and 50 (*Road and rail traffic as a barrier to the movement of caribou*).	
GN-IR#49	The GN requests the Proponent provide the following information: 1. With respect to the selection of caribou trails for the assessment: a. Please explain why trail survey data from 2006 to 2008 were not used in the analysis. b. If trails were found on the railway alignment during the 2006 to 2008 surveys, please include these in the analyses and present the results. c. In an attempt to examine the effect of, and/or account for, potential bias in detecting trails during surveys, the GN recommends using 2 alternate sources of data. The GN requests the Proponent comply with the following in its response: (i) If the tracks of satellite collared caribou cross the rail alignment, these crossing locations (although potentially somewhat imprecise) should be included as trails in the assessment and the result presented. (ii) Please use a set of 100 randomly generated crossing locations along the rail alignment to simulate the impact on movements if caribou are not selective of crossing location. The Proponent should present the assessment results for these simulated trails. The GN recognizes that these simulated trails do not necessarily model caribou behavior. However, the results would provide important context for interpreting results obtained from use of the trail survey data which at present may be biased. 2. With respect to the criteria for determining the significant rating of the caribou trail assessment: a. Please provide justification for the criteria used, citing relevant studies or other evidence where available. Clarify if these criteria are based on professional judgement only.	

	Please note that this information request should be addressed in conjunction with GN IRs # 6 (*North Railway Design and Physical Structure*), 48 (*Railway as a barrier to movement of caribou*) and 50 (*Road and rail traffic as a barrier to the movement of caribou*).	
GN-IR#50	The GN requests the Proponent provide the following information: 1. Please provide evidence to support the use of a 100 m buffer in the above noted analysis. If available, this should include reference to systematic studies of the behavioral and distributional responses of barren-ground caribou, in open tundra, to haul trucks or trains. 2. Please explain the rationale for applying the same buffer to trains, ore trucks and other vehicles, providing evidence to support this rationale such as published, systematic studies. 3. Please provide summary information in the form of tables and figures, similar to those presented in table 6 (TSD 10; Section 3.3.2) and figures 2 and 3 (TSD 10; Section 3.4.1.2), illustrating the outcome of analysis when a range of alternate buffers are applied to vehicles. For this sensitivity analysis please use a series of buffers ranging from 100 m up to several kilometers. Please apply different buffers to trains, versus ore trucks versus other traffic. 4. Moving trains generate sound and vibration that is propagated along rails to varying distances depending on factors such as train type and speed, track type and condition, sleeper type, ballast type and underlying ground type. There is a large body of published material on this topic. Clarify how far noise and vibration is predicted to be propagated along rails for the northern railway. Please provide reference to a section of the FEIS addendum where this has been presented and reference to relevant literature. Clarify how far noise and vibration is predicted to be propagated along rail lines ahead or behind moving trains, at a level detectable by caribou. Provide a list of studies, if any, that have been conducted on this topic and clarify if this was considered in the assessment.	

GN-IR#51	The GN requests the Proponent provide the following information: 1. Please explain what is meant by: "should prove equally effective." (TSD 10; Section 3.4.1.2) Clarify What the current proof of effectiveness is. Clarify how effectiveness will be proven through subsequent monitoring. In this regard, please note that simply documenting cases of caribou crossing the rail line is proof that some individuals will cross but does not by itself quantify the overall permeability of this structure to the north Baffin caribou herd. 2. It is noted that railway design criteria presented in section TSD 02; Appendix D; Section 9.11.2 provide for a total of 11 caribou crossing structure along the railway; an average of 1 every 10 km. Please provide, if available, references to published studies demonstrating that engineered wildlife crossing structures at points along roads or railways serve to increase the permeability of these structures to barren-ground caribou. Again, please note that documenting use of these structures by caribou is proof that some individuals will cross them but does not, by itself, quantify permeability of a road or railway. 3. Please clarify what is meant by: "The Northern Transportation Corridor will have modified embankments (if necessary)." (TSD 10; Section 3.4.1.2) Clarify if all embankments along the corridor will be engineered to heights of less than 2 m and a side slope of < 1V:2H. 4. Provide evidence to support the notion that an embankment height of < 2 m and a slope of < 1V:2H is permeable to caribou and how this has been quantified. Please provide, if available, references to published studies demonstrating that these design criteria enhance the overall permeability of a road or railway to caribou.	
GN-IR#52	The GN requests the Proponent provide the following information:	

	1. Please indicate where in the FEIS addendum, details of the modelling methods and results for the 5 scenarios presented in section 3.4.1.5 (TSD 10) can be found. If not provided in the FEIS addendum, please provide these methods and results in full. 2. With respect to the modelling exercise presented in attachment 1 (TSD 10), please clarify whether the caribou collar data used to estimate caribou use of the area around the Project were collected during a period when there was no development activity in the RSA (e.g. exploration activities, camps, roads etc.). If development activities were taking place, please provide a summary of those activities and discuss the potential effect on the accuracy of the model results. 3. With respect to the modelling exercise presented in attachment 1 (TSD 10), please explain how use of a fixed harvest rate of 75 caribou realistically demonstrates the impact of development on the ability of the north Baffin caribou to sustain a harvest that will likely increase to meet the basic needs of Inuit as the population recovers. Please repeat this modelling exercise using the scenario described in the previous section of this information request.	
GN-IR#53	The GN requests the Proponent conduct an assessment of cumulative exposure to Chemicals of Potential Concern through all complete and significant exposure pathways.	IR limited to providing additional discussion or clarification on topic; any need for a new assessment would be determined through tech review process
GN-IR#54	The GN requests the Proponent complete further quantitative assessment regarding risks due to blueberry consumption to support its conclusion that ingestion risks are not present. In particular, the assessment should answer whether this conclusion remains valid if blueberries are consumed if this pathway is found to be complete and significant (i.e. if blueberries or other available country foods are available and regularly consumed).	IR limited to providing additional discussion or clarification on topic; any need for a new assessment would be determined through tech review process
GN-IR#55	The GN requests the Proponent provide additional information to support the assumption	

	of reduced bioavailability for metals in ore dust. The Proponent should complete a quantitative assessment of the magnitude at which the reduced bioavailability will reduce risks if consumption of blueberries is a complete and significant exposure pathway.	
GN-IR#56	The GN requests the Proponent provide clarity on the areas where increased deposition is expected and whether human receptors will have access to these areas. In its response, the Proponent should describe how consideration was given to both workers and others utilizing the lands and waters in the area.	
GN-IR#57	The GN requests the Proponent provide rationale respecting how dust suppression measures were factored into prediction of dustfall rates for the Tote Road (e.g. type of mitigation measure and the duration of mitigation).	
GN-IR#58	The GN requests the Proponent provide the relevant stakeholder feedback as outlined in TSD 13 – Surface Water Assessment.	
GN-IR#59	The GN requests the Proponent provide a description of how the construction materials, operation of the rail line, maintenance of the rail line, and accidents may affect groundwater and surface water quality.	
GN-IR#60	The GN requests the Proponent provide confirmation that no dewatering is required for the new quarries associated with the Phase 2 Proposal. If dewatering is required, provide an assessment of the potential effects to groundwater quantity, surface water quantity (groundwater fed watercourses) and quality (i.e., temperature).	
GN-IR#61	The GN requests the Proponent provide an outline on how an increase in the baseflow could affect the surface water quality (including temperature).	
GN-IR#62	The GN requests the Proponent provide an assessment of how increased dust generation at the Milne Port may affect the water quality (metals in particular) of Philips Creek.	IR limited to providing additional discussion or clarification on topic; any need for a new assessment would be determined through tech review process

GN-IR#63	The GN requests the Proponent explain how alternative dust suppression methods could potentially affect surface water quality. If no alternatives are identified, please explain if dust generation is expected to increase seasonally due to the reduction of available surface water for suppression.	
GN-IR#65	The GN requests the Proponent provide the following information: 1. Explain why the moderate to high risk diversions are not prescribed a multi-year monitoring program. 2. Provide a more thorough monitoring and mitigation program for all water diversions.	
GN-IR#66	The GN requests the Proponent provide the following information: Ice Conditions: The Ice Conditions Report (TSD 16) indicates that the nominal open water period along the Project's shipping route is August 5 to October 15, resulting in an open-water shipping window of 71 days. However, the Project Description (section 5.1) states that: "[T]he originating ice conditions and ship access study is presented as TSD 16. Shipping routes are generally open water during the period of July 25 to October 15." (TSD 16; Section 5.1) The same open water period (July 25 to Oct 15) is also referenced elsewhere in the FEIS addendum (e.g. TSD 27; Section 1.3.4.4). The Proponent should: 1. Explain the difference in the dates of the open water period as estimated from the ice conditions study commissioned for the Project versus those referred to in other parts of the FEIS addendum. Based on results of the Ice Conditions Report (TSD 16) and assuming a shipping season of July 1 to Nov 15th, there is potential for ice breaking by Project shipping to occur for up to a month during the break-up and freeze-up respectively. The Ice Conditions Report also indicates that: "[I]n the channels close to Milne Inlet (Pond Inlet, Milne Inlet, Navy Board Inlet and Eclipse Sound), the sequence of clearing events during break-up is quite rapid. Break-up generally	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process

	starts in mid-July and lasts 3-4 weeks." (TSD16; Section 2.1) This information suggests that once the process of ice break-up is initiated it proceeds rapidly. 2. Noting that ice-breaking by ships is a form of anthropogenic break-up, what potential is there for the proposed shipping (in particular that occurring during early July) to advance break-up in this area? Was this assessed? If available, provide evidence in the form of studies or other materials demonstrating that Project shipping will not advance break-up and clearing of ice. In providing a response, please take into account estimated levels of shipping during break-up and the likelihood that Project shipping will make multiple tracks through sea-ice rather than all ships following the same track. Please provide evidence to substantiate assumptions and predictions regarding ship tracks (e.g. a map of the area showing Global Positioning System tracks for all ships that have broken ice while servicing the currently Approved Project) (see also GN IR 73 - *Marine Shipping Routes*). 3. The Ice Conditions Report also indicates that the typical timeframe for freeze-up in this area is short, occurring from mid-October, with the first signs of ice formation, and mid-November, with the consolidation into land fast ice over 30 cm thick. What potential is there for the proposed shipping to delay freeze-up in this area? Was this assessed? Shipping Window: There are differences in the dates of the commencement of the proposed shipping season amongst sections of the FEIS addendum. A season from July 1 to Nov 15 is indicated in some sections (e.g. TSD 02; Appendix C, TSD 02; Section 4.2.4, and TSD 24; Section 2.5.2.2) while in others a season of July 15 to Nov 15 is referenced (e.g. TSD 02; Section 4.1.4, 5.1, & 5.2). 4. Clarify the dates of the proposed shipping season for the Phase 2 project. Overall Shipping Rates:	

	Reported rates of marine shipping for the Project are inconsistent throughout the FEIS addendum documents. For example, section 1.3.4.4 (TSD 27) indicates there will be an estimated 176 vessel trips over the shipping season. This figure is inclusive of ore carriers, sealift vessels and tankers. In contrast Table 1-1 of the Project Description which indicates shipping for Phase 2 will be 134-164 for ore carriers plus 18 freight deliveries and12 fuel deliveries for a total of up to 194. Additionally, as noted in the Ice Conditions Report (TSD 16), and in the Project Description, the proposed shipping window will require ice management vessels at the beginning and the end of the season some of which will need to escort ore ships for 400 to 500 nautical miles (NM) in Baffin Bay all the way to Milne Inlet. These ice management vessels do not appear to be included in estimates of ship traffic provided. Finally, it is unclear from the tables presented in the FEIS addendum whether the term 'trip' refers to a round trip or a one-way vessel transit. 5. Although the GN appreciates that only estimates of ship traffic can be provided at the present time, it is important to have a clear understanding of the rates considered in the assessment. The Proponent should provide a definitive table of estimated marine ship traffic for the Phase 2 Project. This table should summarize separately the different types of shipping including ore ships, fuel tankers, freight ships and ice management vessels (that will escort ore ships). Please express shipping rates as the mean estimated number of one-way vessel transits to or from the Milne Port site. Please also provide within this table estimates of the minimum and maximum conceivable shipping rates for each type of traffic. Timing of Shipping: It is unclear from the FEIS addendum how much of the Project's marine shipping could involve ice-breaking in the RSA or in Baffin Bay proper. It is noted that: "[M]ost shipping would occur during the open water season, with shipping to occur during the	

	periods of ice break up and ice formation, as required." (TSD 02; Section 4.2.4) The phrase "as required" is not explained further and estimates of shipping that could occur before Aug 5 or after Oct 15 (i.e. outside the nominal open water period identified in the Ice Conditions Report – TSD 16) are not provided. Additionally, the FEIS addendum does not contain information on the handling times of ships visiting the Milne Port site. It is therefore not possible to review whether the proposed 3-fold increase in shipping can be readily accommodated within the nominal 71 day 'open water period' through the addition of a second dock facility or if it will require extensive shipping through ice. 6. The Proponent should further explain what is meant by "as required". What factor or factors will be used to determine when shipping is to occur during the periods of ice break up and ice formation? What criteria or decision tools will be implemented? 7. For all types of marine shipping that have occurred for the currently Approved Project, provide summary information on frequency of shipping in the form of a histogram showing times of arrival and departure at the Milne Inlet port in weekly bins from July 1 to Nov 15. This information is requested in-order to understand the existing shipping pattern in relation to the nominal open water period (Aug 5 to October 15) identified in the Ice Conditions Report (TSD 16). 8. For all types of marine shipping that will be associated with the Phase 2 Project, provide a table of estimated marine ship traffic for the Phase 2 Project in the following intervals that approximate break-up, open water and freeze-up based on the Ice Conditions Report (TSD 16): July 1 to August 4, Aug 5 to Oct 15, Oct 16 to Nov 15. Where possible this should summarize separately the different types of shipping including ore ships, fuel tankers, freight ships and ice management vessels (that will escort ore ships). Where pooled estimates are provided, please indicate the vessel types included. Please express shipping rates as the mean estimated	

	number of one-way vessel transits to or from the Milne Port site. Please provide within this table the estimates of the minimum and maximum conceivable shipping rates for each type of traffic within these time intervals. 9. Using data from the current Approved Project if available, or other referenced sources, provide estimates for the average expected handling time (hour or days) of an ore, freight and fuel vessel using the Milne docking facilities. This should include time required to dock, load or unload and depart. Please note any predicted seasonal variation in handling times.	
GN-IR#67	The GN requests the Proponent provide the following information: 1. Clarify what the shipping route is outside the RSA and if icebreakers will be operating on this route outside of the dates they will be operating within the RSA. If so, clarify if the period of time the icebreaker(s) will be on hand to operate. Clarify how many ice breakers will be on hand. Clarify if the icebreakers use the same route on every trip. 2. Clarify the estimated speeds the ice breakers will be travelling at, inside and outside the RSA. 3. Clarify the sound levels of ice breakers during various speeds of travel, both while the vessel is actively engaged in breaking ice and when not. 4. Provide a literature review of the potential impacts of icebreaking on the marine mammals that occur in the RSA. Clarify the measures that will be taken to mitigate any impacts on marine mammals and the measures taken to evaluate impacts on marine mammals. 5. Detail the range for marine mammal disturbance from the ice breaking vessels. 6. Explain what was done during the 2018 shipping season to understand the impacts of icebreaking on marine mammals. Clarify how many interactions were documented with marine mammals during ice-breaking activities and what information was collected on marine mammals during ice breaking activities.	IR limited to providing additional discussion or clarification on topic
GN-IR#68	The GN requests that the Proponent provide information for the following: 1. Clarification on the methods used for data collection. Describe how knowledge gathering	IR limited to providing additional discussion or clarification on topic

	was conducted, how participants were selected, etc. 2. A list of the questions asked during workshops. 3. Clarification on the number of people that attended the workshops. 4. Clarification on the methods used in data analysis. 5. Clarify whether there was consensus on topics and how many people agreed or disagreed. 6. Robust and complete results from marine mammal survey within the RSA.	
GN-IR#69	The GN requests the Proponent to update its CEA to include the more recent and relevant North Baffin caribou surveys conducted by the Department of Environment Wildlife Division. The Proponent's CEA should accurately describe these surveys and differentiate between which surveys are conducted to determine abundance and which are used to determine herd composition.	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process
GN-IR#70	The GN requests the Proponent provide a revision of the Proponents CEA to include its plans for any future development.	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process
GN-IR#71	The GN requests the Proponent provide the following information: 1. An updated standalone section on the assessment scoping and methodology. Describe in detail the proposed revision in the assessment scoping; indicate the updates that are made in the baseline and assessment comparing to the Approved Project. 2. A coherent set of criteria proposed to assess significant effects (i.e. make a clear statement for what exactly is considered a significant effect and why). 3. Improved methodology of cumulative effects assessment (i.e. describe the criteria of assessing the cumulative effects). 4. Use consistent terminology when discussing "key indicators".	IR limited to providing additional discussion or clarification on topic; inadequacy of assessment would be determined through tech review process
GN-IR#72	Little is known about the impact of shipping on polar bears. However, the assumption that there is no important interaction between Project	

	shipping and polar bears (and their sea-ice habitat) is unsubstantiated. This interaction should have been assessed. Baseline information on polar bears exists to support an assessment or an update to a previous assessment. Several gaps in information regarding the rates, timing and routes of shipping, as well as ice management measures are apparent within the FEIS addendum. These gaps limit reviewers in properly understanding the potential for ice-breaking through important polar bear habitat and must be addressed in-order to conduct an accurate, or at least robust, assessment. The GN has attempted to address these gaps through other information requests in this submission (GN IRs 66 (*Marine Shipping Rates and Schedule and* 73 *(Marine Shipping Routes*). Subject to review of the responses to those requests, the GN may recommend that additional assessment work be conducted by the Proponent. The GN requests the Proponent provide the following information: 1. Explain how the RSA used in the FEIS addendum for the assessment of polar bears complies with NIRB guidelines. 2. Explain how this RSA represents an "ecologically relevant scale" for polar bears. 3. Explain why the assessment did not consider the Baffin Bay polar bear sub-population as a unit for assessment of Project, cumulative or transboundary effects. 4. Explain why the assessment of the shipping effects on wildlife excluded the route(s) through Baffin Bay and what information about shipping makes this a reasonable approach. 5. Given the potential for marine shipping associated with the Project to break sea-ice for up to a month during break-up and freeze-up respectively, explain why the assessment did not consider the interaction between marine shipping and polar bears (on ice) or their sea-ice habitat.	
GN-IR#73	The GN requests the Proponent provide the following information: 1. Explain why the description of marine shipping routes and the assessment of effects of	

	shipping on wildlife was limited spatially to the segment running from Milne Inlet, through Eclipse Sound up to the boundary of the NSA east of Pond Inlet and how this complies with EIS guidelines. 2. The Ice Conditions Report indicates that the proposed extension of the shipping season will: "[R]equire the participation of DNV ICE-17 (equivalent to PC 3 for the calculation of AIRSS accessibility) ice management vessels at the beginning and the end of the season. ...In fall, the extension of the season until mid-November would require an escort for 400 to 500 NM in Baffin Bay all the way to Milne Inlet." (TSD 16; Section 4.3) a. Clarify if any of the ore carriers used by the Project will be PC 3 vessels. b. Clarify whether the Project will use ice management vessels to escort Project related shipping through Baffin Bay. If so, please specify the estimated number of transits of these escort vessels. 3. The Ice Conditions Report (TSD 16) indicates that a model was used to generate simulated routes from the regional ice charts. The generated routes were: "[M]eant to avoid or minimize the distance spent in the harshest ice regimes." (TSD 16; Section 3.1.2) Figure 28 shows an example of a voyage simulated by the model from a Canadian Ice Service regional chart, where the route seeks to avoid difficult ice regimes, even though it ends up elongating the distance traveled. a. Clarify whether the model generated the routes based on criteria intended to avoid or minimize distance in ice or if the model used an inputted route and, based on this route, calculated the Ice Numerals (INs). b. Based on the modelling work done and the simulations of shipping routes, clarify if it is possible to delineate (via an appropriate analytical method) for each of the different vessel types (classes) that will be used to support the Project: (a) the shipping route(s) or corridor(s) through Baffin Bay that are most	

	likely to "minimize or avoid transit in the harshest ice regimes"; and (ii) for comparison, those route(s) or corridor(s) representing the most direct route possible based on the vessels capabilities and INs. If so, please provide these as route/corridor maps overlain on examples of worst and best-case ice years for the period 1980-2016. This request is specific to the 'shoulder seasons' July 1 to Aug 5 and Oct 15 to Nov 15 (or for the periods early July, later July, late Oct, early Nov). Please provide separate maps for each season/period. c. For each of the 2 requested route scenarios, please provide a table summarizing estimated/predicted mean (and variance in) transit time in sea-ice, by vessel type, for a voyage to or from Milne Inlet. If data are available, please also summarize transit time by ice cover type. d. Clarify to what extent the Proponent can or will manage the selection of routes used by ships transiting through Baffin Bay during the shoulder seasons and what factors the Proponent can or will consider. e. Clarify to what extent the Proponent can or will manage shipping according to route scenario 3(a) above. It is noted that application of the route selection criteria ("avoid or minimize distance spent in harshest ice") will result in longer travel distances than could be achieved through the use of vessels with ice capabilities that permitted ice breaking along a more direct route to and from Milne Inlet. Clarify if these same criteria be applied to the management of Project shipping. See for example the route illustrated in figure 4 which illustrates ice conditions on July 12, 2004 (TSD 16). Clarify how the Project shipping route will be determined in this scenario. If vessels capable of transiting the areas of 3/10th, 5/10th or 10/10th ice cover shown in this map were available clarify if they would take the indirect, open water route shown on the maps or a more direct route through the ice. f. The Shipping and Marine Wildlife Management Plan specifies that with respect to charter vessels:	

	"An Ice Information Contractor will be engaged to forecast ice conditions at the time of the vessel's planned loading and will advise what, if any, ice class is required." (TSD 28; Appendix V; Section 3.1). Presumably, there is a two-way component to making this determination, with the Proponent able to provide route specifications and criteria to the contractor which in turn affects the class of vessel required. Clarify what decision tools, if any, will be employed to manage the effects of shipping on sea-ice. If a choice is possible, clarify if the Proponent will select for the shortest routes, using the most capable ice vessels available and if certain types or areas of ice will be avoided despite ships being capable of transiting through them. Clarify what policies or procedures, if any, will be employed to avoid or minimize shipping effects (i.e. ice breaking) on polar bear sea-ice habitat. g. From modelling work done and based on other factors, please delineate areas or zones in Baffin Bay where transit will not occur during the shoulder season due to vessel-related regulatory restrictions (e.g. such as negative INs). Clarify if there are areas or zones where the Proponent will not transit as a matter of Proponent company policy. If so, please provide a map to illustrate this. 4. Assuming track data are available, please provide a map showing the routes through Milne Inlet, Eclipse Sound, and Baffin Bay used by each vessel that has transited to or from Milne Inlet between July 1 – Aug 5 or Oct 15 – Nov 15 for the currently Approved Project. 5. The FEIS addendum suggests that the disruption of sea-ice by marine shipping will be minimized because ships will follow the same tracks through on transit to and from the Milne Inlet port (TSD 24; Section 2.5.2.2). a. If available, please provide evidence to substantiate the practicality of this mitigation measure. If available, please provide maps	

	showing the tracks of all ships that have transited through sea-ice ice to and from the Milne Inlet port site during operation of the currently Approved Project. Please also provide similar evidence available from other mining projects that ship during ice-covered periods. b. Clarify if this mitigation measure applies to sections of the shipping route that are outside the marine RSA. Please provide evidence, derived from operation of the currently Approved Project or other sources, that this is achievable.	
GN-IR#74	The GN requests the Proponent provide the following information: 1. Clarify if new employees will be required to find housing themselves on the private rental market, or whether the Proponent will provide staff housing. 2. Clarify if or when employees will require hotel accommodations instead of housing. 3. Clarify whether the Proponent will include a financial literacy module in the Work Readiness program.	
GN-IR#76	The GN requests the Proponent provide information on current and planned training programs offered onsite that provide recognized transferable certification or credentials.	
GN-IR#77	The GN requests the Proponent provide following information: 1. Current measures that specifically encourage female employment and retention. 2. Current practices aimed at attracting women to training programs or initiatives (such as the Heavy Equipment Operators training program, the Apprenticeship training program, and the Supervisory training program) or in skill development or career advancement. 3. Current practices aimed at reducing gender-based barriers to employment and that may attract female employees. 4. Any harassment policies or measures currently in force. 5. Clarify the timeline for completing the 'zero tolerance harassment policy' and whether it will be publicly available.	

GN-IR#79	The GN requests that the Proponent provide the planned rail safety communication practices for the public and/or land users, including frequency of communication or engagement.	
GN-IR#83	The GN requests that the proponent provide clarification and additional information concerning: 1. Who is providing the training to employees? 2. How is the training scheduled to ensure adequate coverage (i.e. all employees trained?) 3. The scope of the training program (i.e. what does the training consist of?)	
GN-IR#84	The GN requests that the Proponent provide detailed information about the measures put in place to protect the archaeologically rich zone located east of the Milne camp. For example, is this Exclusion Zone visually defined? How are the on-site staff and visitors informed of the Exclusion Zone being restricted access?	
GN-IR#85	The GN requests that the Proponent clarify whether archaeological work took place in 2018 and give details regarding the nature of any work performed.	
GN-IR#86	The GN requests that the Proponent provide additional information on: 1. How the corporate income tax revenues were: a. calculated to be $681 M in total in the four years 2034-2037 b. excluded from other jurisdictions 2. How the GN portion from the total corporate income taxes ($321.0 M of which is 50% of all projected GN revenues) was allocated.	
Parks Canada (PC)		
PC-IR#1	**PCA-1(a):** Please define the anticipated total annual sailings for each of ore, freight and fuel vessels. **PCA-1(b):** For all project shipping (ore, freight, and fuel vessels) please clearly define (1) vessel speed limitations, and drift zone and anchoring locations (2) the time of day that ships will be transiting the project area (3) what criteria/parameters will be used to determine the location and use of anchoring and the drift zone, and the number of ships in the project area at one time, and (4) describe potential effects to the marine ecosystem resulting from the use of	

	additional and current anchoring locations and the use of the drift zone. **PCA-1(c):** Please explain (1) how masters of all project vessels (ore, freight, and fuel) will consistently be provided with the same instructions/updates related to shipping mitigations (including vessel speed, use of drift zone, and anchoring locations), (2) how this information will be updated and distributed in a timely fashion, and (3) how compliance will be determined and enforced. **PCA-1(d):** Please provide updated management and monitoring plans to address the increase in project shipping volume and season.	
PC-IR#2	**PCA-2 (a):** Please explain why project-level shipping effects to the marine ecosystem were not considered as a combined effect from all types of project vessels and provide an updated assessment considering this combined effect. **PCA-2 (b):** Please provide an effects assessment of spills of arctic diesel shipped by fuel tanker. **PCA-2 (c):** Please describe the potential effects on the marine ecosystem, including ice, resulting from a combined spill of arctic diesel and IFO.	IR limited to section (a) and (c)
PC-IR#4	**PCA-4(a):** Please define the dates for the proposed Phase 2 shipping season (for all vessel types: ore, freight, and fuel) and identify if these dates include the window for operational flexibility. **PCA-4(b):** Please provide the criteria that will be used to adjust the shipping season to weather and ice conditions. **PCA-4(c):** Please provide the approval process that will take place each year in deciding when to open and close the shipping season, including the format of community input.	
PC-IR#5	**PCA-5(a):** Please describe "*ice management activities*"; define when, where, and how these activities will be undertaken and describe if they will be conducted to ensure safe passage of freight and fuel ships in addition to ore carriers. **PCA-5(b):** Please describe what measures will be implemented to address vessel safety (for ore, freight, and fuel vessels) when ice management activities are being undertaken (e.g.: to reduce the risk of ice entrapment or collision between IMV's and escorted vessels) and how these measures will be relayed to all vessel masters.	

PC-IR#7	**PCA-7 (a):** Please describe the specific methods that will be used to ensure that all mammals are detected in the exclusion zone, particularly for ensuring the detection of mammals who enter at depth and may not be visible from the surface, and what steps will be taken once a marine mammal is detected.	
PC-IR#8	**PCA-8 (a):** Please outline the locations and amounts of untreated sewage released from project vessels within, or in the vicinity of, the proposed NMCA. **PCA-8 (b):** If untreated sewage is disposed of within or near the proposed NMCA, please provide an effects assessment.	IR limited to addressing section (a). Section (b) should be addressed in the technical review stage.
Health Canada (HC)		
HC-1	1. Clarification if the PSL exceeds or does not exceed the PSL at the HTO Cabin – this is currently not clear. 2. Health Canada recommends further evaluation of human health impacts, including vulnerable persons, with regards to noise. Including at locations identified to be places used	IR limited to item 1
Fisheries and Oceans Canada (DFO)		
IR 3.1.1	**IR 3.1.1:** Provide an updated table which contains all information related to watercourse crossings, diversions, and encroachments. The table should include: a) A numbered list of proposed crossings, diversions, and encroachments; b) If the crossing is permanent, temporary, new, replacement, extension, or modification; c) The type of crossing structure (e.g. bridge, culvert). In cases where a single or multi barrel culvert crossing is proposed, please indicate if a box culvert or bridge is a feasible alternative; d) Information regarding locations that will have more than one crossing, diversion, or encroachment on the same waterbody; e) Fish-bearing status and species present. For fish-bearing status, please indicate yes/no. In cases where uncertainty exists (e.g. “possible, “probable”, “possible”, “unlikely”), DFO will consider these habitats to be fish-bearing; f) Description of fish habitat and waterbody characteristics; and,	IRs limited to 3.1.1, 3.1.2, 3.2.1, and 3.2.4

	g) Amount (m_2) of fish habitat permanently altered or destroyed at each site. **IR 3.1.2:** Provide the approaches that will be used to provide passage in watercourses where Arctic char are present.	
	IR 3.2.1: Provide an updated/consolidated table which contains all information related to shipping. The table should include information from 2019-2035 regarding: a) Numbers of ships (totals for types and overall total for all vessels); b) Types of ships (e.g. Pananax/Cape Sized); c) Number of round trips for all types of vessels; d) Shipping season schedules in relation to a, b, and c; and, e) Support vessels (number and type) in relation to all the above, this includes tugs and icebreaking vessels. **IR 3.2.2:** Provide additional information on: a) Areas that will be impacted by noise that may extend shoreline to shoreline and the potential impacts to mammals that are not expected to display displacement/abandonment; b) Information on proposed anchorage areas including routing, duration of vessels in anchored areas, and maximum number of vessels expected; c) The approaches that will be used to mitigate the cumulative effects of strikes and sound on habitats used by marine mammals in areas where avoidance behaviour may not occur; d) The approaches that will be used to mitigate the cumulative effects of strikes and sound on habitats used by marine mammals for nursery, rearing, and foraging, especially in areas where avoidance behaviour may not occur; and, e) The monitoring approaches that will be used to assess impacts of all activities to marine mammals during shoulder seasons. **IR 3.2.3:** Provide a memorandum to summarize and discuss the results from 2014 and 2015 marine mammal surveillance monitoring program conducted onboard the Project ore carriers in 2014 and 2015. **IR 3.2.4:**	

	Provide clarification on how acoustic modelling incorporated potential impacts of ice (e.g. ice cover, movement of vessels through ice-covered waters).	