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June 27, 2011

Eli Nasogaluak
Coordinator, Environmental Impact Review Board
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RE: Draft EIS Conformity Review for the "Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories

Please find attached comments on the draft EIS conformity review from federal departments.

Parks Canada and Natural Resources Canada have no comments at this time.

Should you have any additional questions or comments please contact the undersigned by telephone at (780) 495-2530 or by email at sean.carriere@ceaa-acee.gc.ca.

Sincerely,

Sean Carriere
Project Manager
Canadian Environmental Assessment Agency

cc John Cowan, Transport Canada
Sarah Olivier, Fisheries & Oceans Canada
Lorraine Seale, Indian and Northern Affairs Canada
Nelson Perry, Parks Canada Agency
John Clarke, Natural Resources Canada
Rebecca Stranberg, Health Canada
Stacey Lambert, Environment Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

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Your file *Votre référence*
02/10-05

Our file *Notre référence*
10-HCAA-CA6-0006

Environmental Impact Review Board
PO Box 2120
Inuvik, NT
X0E 0T0

June 27th, 2011

Dear Mr. Nasogaluak:

Subject: Department of Fisheries and Oceans Canada Comments on the Conformity of the Environmental Impact Statement with the Terms of Reference for the Environmental Impact Review of the Construction of the Inuvik to Tuktoyaktuk Highway Project

The Department of Fisheries and Oceans Canada (DFO) is pleased to provide the Environmental Impact Review Board (EIRB) with the following comments on the conformity of the Environmental Impact Statement (EIS) with the Terms of Reference (ToR) for the Inuvik to Tuktoyaktuk Highway Project.

Our conformity review focused primarily on the following sections of the ToR that relate to fish and fish habitat, specifically:

- Section 8.1 – Key Issues
- Section 9.1 – Biophysical Environment
- Section 10.1 – Biophysical Components
- Section 10.1.4 - Water Quality and Quantity
- Section 10.1.6 - Fish and Fish Habitat
- Section 10.1.10 - Biodiversity
- Section 10.2.8 - Harvesting
- Section 10.3 – Accidents and Malfunction
- Section 10.4 – Effects of the Environment on the Project
- Section 11 – Cumulative Effects
- Section 13 – Follow-up and Monitoring
- Section 13.2 – Compliance Monitoring
- Section 13.3 – Environmental Management Plans
- Appendix A – Water Quality and Quantity
- Appendix A – Fish and Fish Habitat

DFO wanted to ensure that the proponent provided a reasonable amount of detail in their EIS to address the requirements set out in the ToR. In addition to our conformity review, we have also taken this opportunity to outline where additional information may be required to adequately assess impacts to fish and fish habitat. Though this information may not be included in the EIS, we are of the opinion that most of these details can be provided during the next stages of the environmental impact review.

Section in ToR	Information Requested	DFO's Conformity Comments
8.1	**Key Issues** **Identification of VC's**	Discussed in EIS - Sections 4.1 with more detail on fish species in 3.1.7
9.1	**Biophysical Environment** **- Fish and Fish Habitat**	Discussed in EIS - Sections 3.1.5, 3.1.6 and 3.17.

	- Water Quality and Quantity	
10.1	**Biophysical Components** **- Fish and Fish Habitat** **- Water Quality and Quantity**	Discussed in EIS - Sections 4.2.4 and 4.2.4.
10.1.4	**Water Quality and Quantity**	
	Describe and evaluate the potential impacts of the Project on water quality and quantity, including a consideration of: - In-stream activities (e.g. watercourse crossings);	Discussed in the EIS.
	Changes to water quality at water crossings (bridges, culverts and other wetted areas);	Discussed in the EIS.
	Changes to water quality due to thaw slumps;	Mitigation measures discussed in the EIS
	Erosion, sediment deposition, sediment re-suspension;	The EIS does not seem to discuss the specific impacts of sediment on water quality, but impacts on fish and fish habitat are discussed in Section 4.2.5.1.
	Increased turbidity; Subsidence; Slope stability; Flow or water levels including the formation of frost bulbs and related icings at watercourse crossings;	See comment above – Specific impacts to water quality do not seem to be discussed in the EIS.
	Water withdrawal and volume of withdrawal; and	Discussed in Section 4.2.5.1 but only in the context of impacts to fish and fish habitat but not specifically for water quality/quantity.
	Gravel extraction.	Same as above
10.1.6	**Fish and Fish Habitat**	
	Potential impacts of the Project on VECs related to fish and fish habitat, including: Proposed watercourse crossings and temporary vehicle crossing methods;	No drawings or conceptual plans provided for the installation of culverts (in Section 2.6.6 conceptual plans were provided for clear-span bridges) The physical disturbances, flow patterns, etc. are mentioned as impacts but the duration and extent are not clear.
	For each method, describe how habitat could be altered, and Identify any criteria that would be used to select the methods to be used for each watercourse crossing (e.g., stream classification).	Discussed in the EIS.
	Standards or guidelines related to watercourse crossings that would be applied;	In Section 2.6.6 of the EIS, it is stated that culverts will be installed with “little disturbance to the ground”, “based on experience gained with construction of the Tuktoyaktuk to Source 177 access road”. In Section 4.2.4.1 it states that the INAC Land Use Guidelines and DFO Land Development Guidelines (1993) will be used and both recommend embedding culverts as well as insulating culverts as best practice. The statements made in Section 2.6.6 are not consistent with the

		guidelines states in other parts of the EIS. DFO recommends that the guidelines be followed. Also please note that the DFO's Land Development Guidelines were developed for the Pacific Coast Region, and although the principles of culvert installation remain the same throughout the country, the specific considerations of working in a permafrost region should be considered. The Standards for explosives have been updated with regards to the NWT. All operations involving explosives near water bodies should be reviewed by DFO. Two useful references are 1. Offshore Oil and Gas Environmental Effects Monitoring: Approaches and Technologies / edited by Armsworthy, Shelley, Peter J. Cranford, Kenneth Lee. Cott, P., B. Hanna. 2005. Monitoring Explosive-Based Winter Seismic Exploration in Water Bodies NWT 2000- 2002. 2. Cott, P., B. Hanna, J. Dahl. Canadian Manuscript Report for Fisheries and Aquatic Sciences 2648. 2003. Discussion on Seismic Exploration in the Northwest Territories 2000–2003.
	Relevant policies, management plans or other measures to protect or enhance fish and fish habitat, including timing restrictions, protected areas or regulations;	Timing restrictions are mentioned. Protocol for Winter Water Withdrawal in the NWT is discussed. DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998) are no longer relevant in the NWT. Please see comment above. Erosion and sediment plans and best practices are mentioned as mitigation but are not described further. A draft erosion and sediment control plan should be developed during the EA.
	Disruption of sensitive life stages or habitat including loss of substrate habitat, known sensitive or important sites;	Sensitive life stages or habitat are not specifically identified in the EIS.
	Features such as in-stream structure, riparian zones, water quality and flow regimes; Impacts on food resources; Impacts on water quality or quantity; Distribution or abundance;	Discussed in the EIS.
	Sensitive or important areas or habitat;	Some details provided in Section 3.1.7.10
	Contaminant levels in harvested species that could	Discussed in the EIS in section 4.2.5-1

	be changed by the Project, if applicable; - Fish health and condition; - Blockages to movement; - Blasting (if required); - Dredging or disposal of sediments; - Underwater noise associated with Project activities; - Water withdrawal; - How Project-related changes in harvest pressures could impact the resource;	
	Effects to fish populations and harvest activities;	Details not found in EIS.
	Description of any works that may result in potential impacts to fish and fish habitat that cannot be avoided or mitigated, and that may result in harmful alteration, disruption, or destruction (HADD) on fish habitat;	The activities that will likely require Authorizations (specifically culvert installation) are represented in Table 4.2.5-1 as mitigable by "avoiding critical habitats". There is no mention of the authorization process in this section or a HADD. There is mention of the loss of instream habitat but no discussion on the impacts of this loss of habitat.
	The condition(s) to which the ROW (in stream and riparian) and temporary work areas would be reclaimed or restored, and maintained once construction has been completed;	Details not found in EIS.
	Criteria for evaluating the success of mitigation or reclamation measures, and indicate when and how this evaluation would be conducted;	Details not found in EIS. The only monitoring discussed is third party monitoring and monitoring during construction.
	The monitoring program for fish and habitat resources of waterbodies along the highway corridor.	Mentioned in the EIS, but little detail provided.
10.1.10	**Biodiversity**	It is not clear where fish biodiversity is discussed in the EIS.
10.2.8	**Harvesting**	More details should be provided on potential impacts to fish and fish habitat from increase access to Husky Lake
10.3	**Accidents and Malfunctions**	Discussed in the EIS
10.4	**Impacts of the Environment on the Project**	Discussed in the EIS
11	**Cumulative Effects**	Discussed in the EIS
13	**Follow-up and Monitoring**	Discussed in the EIS
13. 2	**Compliance Monitoring**	Discussed in the EIS
13.3	**Environmental Management Plans**	Discussed in the EIS
Appendix A	**Biophysical Baseline Information Requirements – Water Quality and Quantity**	
	Provide a description and maps of the existing water resources within or near the boundaries of the Study Area(s) including: waterbodies, watercourses and major drainage areas	Provided in the 2010 Aquatic Program Report, however drainage areas are not defined.
	watercourses that have year-round flow	Details not found in EIS. The proponent assumes that all watercourses along the route freeze to the bottom. This has not been determined in the field and the larger watercourses should be assessed

		for year-round flow. The same should be assessed for the deeper, larger lakes along the route for overwintering habitat and water withdrawal.
	the extent of connectivity to adjacent watercourses including any potential seasonal variation	There is discussion of the large freshet in the area; however the extent of connectivity is not detailed for the specific area. Just because the connectivity throughout the area is short, does not mean it is unimportant; it could in fact be more important due to its brevity. The connectivity with regards to the larger watercourses is important and should be presented in the environmental assessment.
	seasonal and perennial springs including ephemeral streams located within or near the boundaries of the study area(s)	Details not found in EIS.
	naturally occurring icings	Details not found in EIS.
	describe the recharge ability of lakes that will be used for winter road watering or ice mining	Details not found in EIS.
	Provide a description of major drainages and watercourses, including the basis for their selection. For each major drainage or major watercourse, as appropriate, provide a description of it hydrological characteristics, including: - flow regimes - variability and sources of variability - seasonal flow patterns - channel and bed morphology and stability	The majority of the references used in this section outline the water chemistry of the area. Some information within the 2010 Aquatic Field Report.
	- sediment load – suspended and bed load - active and historical floodplains - freeze/thaw timing - taliks/permafrost distribution and stability beneath waterbodies - the role of wetlands (e.g., bogs, fens and peat plateaus) In the vicinity of communities and along Project routes being considered, describe: - flood regimes	Described for a creek near Inuvik, NT
	In each major drainage, identify locations of existing and planned water use (domestic, municipal, camp, etc) in relation to the proposed Project routes. For each area of water use that may be affected by the Project, identify: - quantity of use - existing water quality, including relevant federal, provincial and territorial guidelines, criteria and legislation - seasonal or other temporal variation of water quality and use - existing sources of water quality impairment and their locations in relation to Project routes	The EIS states that the proponent will adhere to the DFO's Winter Water Withdrawal Protocol for Ice-covered Water Bodies in the Northwest Territories. Turbidity measurements were taken for the crossings covered by the 2010 Aquatic Field Study. Discussion of seasonal or temporal variability in water quality was not found.

	alternatives	
	Provide a description and maps of existing groundwater resources within the Project Study Area(s), including: - quality and quantity	Details not found in EIS.
	hydrogeological conditions, including depth, flow patterns, recharge and discharge areas	Depth and flow measurements were taken for the crossings covered by the 2010 Aquatic Field Study. Discussion of recharge and discharge areas was not found except for page 149 "*The numerous tundra ponds in the Arctic are recharged during spring freshet, which results* *from snowmelt."*
	Discuss hydrogeological conditions in near-surface materials or deeper formations, where relevant to proposed Project routes, components and activities.	Details not found in EIS.
Appendix A	**Biophysical Baseline Information Requirements – Fish and Fish Habitat**	
	Provide a description of the existing fish and fish habitat within the Project area, including: a description of fish habitat present at each of the planned water crossings, including references (such as photographs and diagrams) at those locations	Only 25km on either end of the proposed route have been assessed for fish habitat. It is DFO's understanding that further studies will be conducted in the 2011 season. DFO will need to see the results of this program before assessing impacts.
	fish species including forage fish (non-harvested) and any other aquatic resources of value present	A partial list of species with potential to exist in the area of the Highway is provided. Forage fish were not included.
	seasonal and life cycle movements and sensitive periods	Completed for the ten larger fish species, not the forage fish.
	habitat requirements for each life stage	Completed for the ten larger fish species, not the forage fish.
	local and regional abundance, distribution and use of habitat types, including aquatic and riparian vegetation	Some information is found in the 2010 Aquatic Field Program Report, however it is not completed for the remaining area of the road. Therefore assessing the abundance and distribution of habitat types along the highway corridor is not completed. Three categories of watercourse are identified and described along the highway corridor.
	known sensitive or important areas in terms of habitat type (e.g., spawning, overwintering, refugia, feeding), species and timing of use	The EIS does not specifically define the most sensitive habitats that may exist in the highway corridor for the species discussed. It defines the risk to the fish species as "low, moderate, or high", however does not describe the risk that the highway would pose with respect to the life stages of the fish. The EIS consistently describes MOST of the headwater lakes as not adequate for spawning as they freeze to the bottom; however the headwater lakes that could

		be adequate habitat are not identified or described along with their associated crossings.
	for species of concern (see Term 10.1.5), also describe specific location, population status, limits and size, sensitivity and limiting factors	Arctic Grayling is identified as "sensitive" by the Government of the NWT but the specific location, limits, size, sensitivity and limiting factors are not discussed.
	baseline contaminant concentrations in harvested species, that may change as a result of the Project and as available	Previous studies from the area are discussed within the EIS
	any known issues with respect to health of harvested species (e.g. parasites, disease, condition)	Cysts in whitefish were discussed as a known issue.
	species of particular importance to subsistence harvesters - species subject to exclusive or preferential rights granted by land claims - species of particular importance to the guiding or outfitting industries - areas subject to exclusive harvesting rights granted to land claim beneficiaries - harvest pressures (subsistence, sport fishing and commercial harvesting) by species, season and geographic area - listing of existing non-native species	Discussed in the EIS.

DFO hopes these comments will be of assistance to the EIRB. If you have any questions, please feel free to contact me at (867) 669-4919, by fax (867) 669-4940, or email Sarah.Olivier@dfo-mpo.gc.ca.

Sincerely,

Sarah Olivier
Environmental Assessment Analyst
Central and Arctic Region
Fisheries and Oceans Canada

Environment Canada | Environnement Canada

Environmental Protection Operations
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Our File No.: 4336 001 009
Your File No.: EIRB 02/10-05

June 24th 2011

Sean Carriere
Project Manager
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Via Email at sean.carriere@ceaa-acee.gc.ca

Dear Mr. Carriere,

RE: EIRB 02/10-05 – Hamlet of Tuktoyaktuk, Town of Inuvik, and the Government of the Northwest Territories – Draft Environmental Impact Statement for Conformity Review – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories

Environment Canada (EC) is providing the comments below in response to the conformity review of the Draft Environmental Impact Statement (DEIS) for Construction of the Inuvik to Tuktoyaktuk Highway, NWT, dated May 2011 (Hamlet of Tuktoyaktuk, Town of Inuvik, and the Government of the Northwest Territories, herein known as the Proponent) requested by the Environmental Impact Review Board (EIRB) (EIRB letter to all registered Parties and Public via its Electronic On-line Registry dated June 3rd 2011). It is our understanding that the Canadian Environmental Assessment Agency (the Agency) will submit these comments to the EIRB for their consideration.

EC comments fall under our mandate arising from the *Canadian Environmental Protection Act 1999 (CEPA),* Section 36(3) of the *Fisheries Act,* the *Migratory Birds Convention Act,* and the *Species at Risk Act* (SARA). EC will provide further details during the technical review.

General Comments

1. According to Section 1.2 *Development Overview* in the DEIS, the current proposed alignment is the Primary 2009 Route, however other route alignment options in the vicinity of the Husky Lakes are also continuing to be considered (page 5 of the DEIS). Section 2.1. *Alignments Considered in the Current Stage of Project Development* (page 38 of the DEIS) describes these alternatives. In order to have an informed technical review of the proposed project, reviewers will require a more defined route.

Specific Comments

2. Section 5.4 *The Development Setting* of the Environmental Impact Statement Terms of Reference (TOR) (dated November 3rd 2010) states that the Proponent is to provide a general overview of the geographical, ecological, social, economic, and cultural setting in which the development is proposed to take place. EC notes that the general overview of the ecological setting is missing from the DEIS (Section 1.4 *The Development Setting* of the DEIS). Furthermore, although Section 1.4.2 *Alternative Alignment* (page 11 of the

DEIS) states that a separate assessment of the routes with respect to social, cultural, and economic setting is not necessary, EC notes that the ecological setting is also missing from this section.

3. Section 5.6 *Study Strategy and Methodology* of the TOR states that any guidelines or best practices that have been used or modified for use in the design and proposed construction and operation of the project are to be included in the DEIS. EC notes however, Section 1.6 *Study Strategy and Methodology* of the DEIS (page 20) currently does not identify any guidelines or best practices used or modified for use.

4. Section 10.1.1 *Terrain, Geology, Soils and Permafrost* of the TOR requests that the Proponent describe and evaluate the potential impacts of the Project on terrain, geology, soils, and permafrost. EC notes that Section 2.2.5 *Technical Factor – Potential for Geotechnical Challenges* (page 51 of the DEIS) states that "the potential for geotechnical challenges is based on the limited terrain assessment" and therefore the DEIS does not include a complete description and evaluation of potential impacts.

5. Section 6.2 *Scope of Project Components and Activities* of the TOR states that the DEIS shall provide a description of all project components that the Proponent deems necessary for completion of the Project and that this shall include a description of the location, the spatial extent, and the temporal extent/project phase of the project component. EC notes that the DEIS does not appear to include "other drainage and thermal erosion control structures" (page 19 of TOR).

6. Section 6.2 *Scope of Project Components and Activities* of the TOR states that the DEIS should describe related project activities, including the construction, operation and maintenance, and where relevant, closure, decommissioning and restoration of permanent and temporary structures associated with the project components and where possible include a description of the location, spatial extent, and temporal extent of the activities necessary for the project. EC notes that the DEIS does not appear to include "management of excavation material, including stockpiles", and the "handling, storage, and use of explosives" (page 20 of the TOR).

7. Section 6.3.1. *New Work and Additional Field Studies Required* of the TOR states that "the proposed schedule, timing of data collection and analysis, and how these results may affect the environmental review and the final design of the development must be discussed" and that the Proponent "must provide explanations as to why this information was not included in the current development submission" (page 21). EC notes that the DEIS does not appear to include this information.

8. Section 4.4 *Accidents and Malfunctions* of the DEIS (page 609) does not appear to contain all the components that Section 10.3 *Potential Accidents and Malfunctions* of the TOR requests that the Proponent include in the DEIS.

9. Section 10.1.5 *Species of Concern* of the TOR states that "the Developer must consider any change that the Project may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of SARA (see definition of impact on the environment in Appendix 3, Definitions). Accordingly, the Developer shall take into account the requirements of SARA and provide the information necessary to evaluate the potential impacts of the Project on the

species covered by this Act including mitigation and monitoring. All direct, indirect, and cumulative effects should be considered. Species under consideration should include both those listed on Schedule 1 of SARA as well as those designated as at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)" (page 32). EC notes that the DEIS does not consider the indirect nor cumulative effects. Further comments on Species at Risk are below.

Table 3.1.9-1 *Terrestrial Mammals Potentially Occurring within the Regional Study* Area of the DEIS (page 216) includes Polar Bear as a terrestrial mammal potentially occurring in the Regional Study Area (RSA) for the project. As discussed above, Section 10.1.5 *Species of Concern* of the TOR specifies that the Developer must consider any change that the Project may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, and that species under consideration should also include those designated as at risk by COSEWIC. Polar Bear are considered a species of "Special Concern" by COSEWIC, and are under consideration for listing on Schedule 1 of SARA.

Polar Bear were not included in the list of wildlife Valued Components (VC) despite their assessment by COSEWIC and their potential occurrence within the RSA. The DEIS should include this species as a VC or provide a rationale as to why it is not included.

10. Section 3.2.8 *Harvesting* of the DEIS Figure 3.2.8-13 (page 411) identifies an area adjacent to the Primary 2009 route that is an "Area Where Geese Congregate". Section 10.1.8 *Birds and Bird Habitat* of the TOR requires that consideration be given to "sensitive or important areas or habitat" for birds (page 33). There is no mention in the baseline description for bird VCs of the area mentioned above as an important habitat site.

11. According to Section 4.3.8.1 *Potential Effects - Protected Areas and Special Management Areas*, page 605 of the DEIS, goose are harvested throughout the Inuvialuit Settlement Region and that "the proposed Highway would cross through portions of this management area. The effects and mitigation measures associated with wildlife and wildlife habitat are discussed in the wildlife effects section (Section 4.2.7)".

    Section 10.1.7 *Wildlife and Wildlife Habitat* of the TOR states that "the Developer shall discuss the duration and geographic extent (e.g., distance of noise related disturbance) of potential impacts in relation to how wildlife populations and harvest activities could be affected" (page 33). EC notes that there is presently no discussion as to how potential project-related impacts such as sensory disturbance, dust and bird collisions with vehicles associated with the road passing through this harvesting site might affect goose harvesting activities in the future.

    The DEIS also states on page 562 that: "In addition to Project mitigation measures, the WMAC, IGC and HTCs, could consider the establishment of a no-hunting zone along the proposed Highway as a public safety consideration to address human safety concerns that arise from hunting from roadways" (Section 4.2.7.6 *Birds and Bird Habitat* of the DEIS).

    The DEIS should discuss how the establishment of this no hunting zone might affect goose harvesting in the area identified above. It should also discuss whether there are

other areas within the RSA that provide equivalent hunting grounds for geese should the value of this harvesting area be diminished or if harvesting in this area is restricted.

If either the Agency or EIRB wish to discuss these comments further, please do not hesitate to contact Ms. Stacey Lambert at (867) 669-4748 or Stacey.Lambert@ec.gc.ca.

Yours truly,

Carey Ogilvie
Head, Environmental Assessment North (NT & NU), EPO

cc: Stacey Lambert, Environmental Assessment Coordinator, EPO
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Health Canada Santé Canada

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June 27, 2011

Sean Carriere
Project Manager
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Sent by e-mail to sean.carriere@ceaa-acee.gc.ca

Subject: Health Canada's Comments on the Conformity Review for the Terms of Reference (ToR) to the Draft Environmental Impact Statement, for the Environmental Impact Review of the Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal

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Dear Mr. Carriere:

In order to assist the Environmental Impact Review Board's (EIRB) conformity review of the Environmental Impact Statement (EIS) with the Terms of Reference (ToR), Health Canada (HC) has reviewed sections that pertain to our departmental mandate and areas of expertise as requested by CEAA in May 31, 2011.

As a Federal Authority providing expertise under subsection 12(3) of the *Canadian Environmental Assessment Act* (the Act) to the northern authority (Environmental Impact Review Board), Health Canada provides the following information for your consideration[1].

General

HC has noted that the draft EIS for the Tuktoyaktuk to Inuvik Highway provides minimal detail on the location and nature of potential human receptors within the regional study area for the EA. HC is aware that with the exception of the town of Inuvik and the hamlet of Tuktoyaktuk, the proposed highway routes are in areas with limited human activity (i.e. residential and traditional land use). However, HC advises identifying human receptors, even if temporary use (i.e., humans using campsites; fishing or hunting cabins; berry picking areas), as this information would better inform HC's

[1] Note that Health Canada's role under subsection 12(3) of the Act is advisory only. The EIRB determines how the advice provided by Health Canada will be used in the Environmental Assessment (EA) process and makes all decisions related to the environmental assessment of the project.

review of the project's human health effects (noise, air quality, water quality, contamination of country foods).

HC suggests that *Figure 4.3.8-1 Existing Land Uses (*draft EIS - p.600) may be a useful place for providing further detail of the location and nature of human receptors as residential leases are identified. HC suggests clarifying the current/likely future human use at these residential leases. There are also several numbered points on this map. Please clarify if there is human use occurring in these areas. It may be useful to provide a table with details about human receptors and the distance to the proposed routes.

The ToR indicates that the EIS should consider HC's *Useful Information for Environmental Assessment*[2] document; however, it is not referenced in the draft EIS. HC suggests considering this document as it provides useful information about assessing human health impacts in EA.

Please note that comments provided below relating to specific ToR items may not apply depending on the outcome of a more detailed analysis of possible location and proximity of potential human receptors along the proposed route between Tuktoyaktuk and Inuvik.

***Air Quality* (ToR section 10.1.2)**
HC notes that the draft EIS includes baseline information about air quality and a qualitative discussion on potential changes in air quality due to project activities; however the EIS does not discuss how these changes in air quality could impact human health. HC suggests including a discussion of potential human health effects resulting from changes to air quality to support the conclusion that "no residual effects in terms of substances are anticipated" (p. 482).

Sections 3.1.3 Air Quality (draft EIS - p. 126) and 4.2.2.1 Applicable Standards, Objectives and Guidelines (draft EIS - p. 471) do not provide a clear link between the standards/guidelines and their use in relation to each phase of the Project (i.e. construction, operation, etc.) as requested in the ToR (p. 30). HC suggests discussing air quality effects by project phase and comparing them to the relevant air quality guidelines / standards in order to better understand potential air quality effects by project activity.

Water Quality and Quantity (ToR section 10.1.4)
HC notes that the draft EIS includes baseline information about water quality and water treatment facilities' details in the EA regional study areas; and provides a qualitative assessment of the project's potential effects on water quality and quantity. However, the ToR indicates that the EIS should include a consideration of changes to "drinking water quality for humans…" (p. 31). There appears to be no specific discussion of the potential effects on drinking water quality. HC suggests including this discussion, and referencing the location of drinking water treatment facilities in proximity to water bodies that may be affected by project activities.

Contamination of Country Foods (referenced in ToR sections 10.1.19 Vegetation; 10.2.6 Human Health and Community Wellness; 10.2.8 Harvesting)
The ToR suggests that the EIS contain a discussion of country foods in a separate section (ToR – p. 35) in the EIS which does not currently appear to be included. HC suggests including this section as proposed as it would facilitate the readers' understanding of country foods issues overall; rather than referring to terrestrial mammals, fish, avian species, and vegetation section; and harvesting sections.

The discussion of baseline country food consumption in Section 3.2.6.4 - .5 was useful and indicated the species consumed and provided some indication of the amount of country foods consumed. HC also notes within the existing environment discussion, the sections on Fish and Fish Habitat; Wildlife

[2] http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php

and Wildlife Habitat, Birds and Habitat; and Vegetation include some baseline information on the current status of some contaminants in these consumed species. However, there appears to be no discussion of how project activities may potentially affect contaminant levels in different species, and, subsequently affect human health if consumed.

For highway development scenarios in remote areas with light traffic and limited industrial traffic, the greatest potential for human exposure to contaminated country foods would likely result from deposition of particulate matter associated with construction activities and from vehicular emissions (particularly diesel). The EIS states that highway may facilitate access to berry picking areas:

> *Tuktoyaktuk have limited areas to pick berries due to the difficulty in traveling on the land during the summer months. In 2010, personal communications between the Project Team and a number of Tuktoyaktuk residents revealed that due to the new all-weather access road between Tuktoyaktuk and Source 177 (which is the north terminus of this Project), the residents were able to pick many berries during the summer months, adding to their traditional food source. The addition of the proposed Highway would allow local residents in Tuktoyaktuk and Inuvik to access additional berry picking areas. (p. 598).*

Due to the potential for increased access to berry picking areas; HC suggests that the EIS include a discussion of the potential for contamination of berries due to project activities along with any proposed mitigation measures, if necessary.

Section 10.1.3 Noise (ToR 10.1.3)

The ToR indicates that:

The Developer shall describe and evaluate the potential impacts of Project-related noise, including a consideration of:

- *Project components or activities that could produce noise levels of concern, including source location, timing and duration.*
- *Disturbance of harvest and recreational activities, including tourism.*
- *Potential impacts to harvesting activities.*
- *Impacts to communities.*

- *The Developer shall provide an assessment of the potential health impacts related to Project-related changes in noise levels, including potential impacts of sleep disturbance and annoyance. Describe the proximity of the Project to sensitive receptors (e.g., human residences/cabins, camps, harvesting areas) and environmental elements (e.g., Husky Lakes, identified VCs)*
- *The Developer will provide a comparison of anticipated noise levels along the highway with current industrial, municipal or ambient noise levels.*

HC notes that the only assessment of potential health impacts related to Project–related changes in noise levels is:

> *Since most activities will occur more than 8 km from the residential centres of Inuvik and Tuktoyaktuk, effects from noise on the general public are expected to be negligible* (p. 483), and *because the noise emissions will be temporary and intermittent there are no anticipated residual negative effects impacting traditional or recreational use of the area* (p. 484).

HC acknowledges that the 8km distance from residential centres would reduce the likelihood of noise-related health related impacts. However the proximity of other receptor locations such as hunting cabins, temporary residences to the proposed route(s) do not appear to be discussed and this information is important when making a conclusion about human health effects due to noise. Even short-term and intermittent noise can have human health effects depending on the sound noise level and proximity to receptors. Therefore HC suggests clearly identifying human receptors present in the project area that are less than 8 km and in close proximity to the proposed route alignments.

Section 3.1.4.2 of the EIS (p. 140) states that:

> *Health Canada is legally required to provide expert advice on the health effects of environmental noise to environmental assessments involving other federal departments*.

Health Canada requests that the above text be removed from this document and not be included in any subsequent document because it is a legal opinion regarding an external organization and it is not appropriate to include in an EIS.

Thank you for providing Health Canada with the opportunity to comment on this project. Should you have any questions concerning Health Canada's comments or identify any other specific human health concerns with respect to this project, Health Canada would be pleased to provide expertise upon request as a Federal Authority, pursuant to subsection 12(3) of the *Canadian Environmental Assessment Act*, or under a territorial / provincial process.

Please feel free to direct your questions or requests to the undersigned.

Sincerely,

<original signed by Nellie Roest on behalf of Kathleen Hedley>

Kathleen Hedley
Director, Environmental Health Bureau
Safe Environments Directorate, Health Canada

c.c.: Nellie Roest, Manager, Environmental Assessment Division, Health Canada
Gregory Kaminski, Senior Environmental Health Assessment Specialist, Health Canada
Rebecca Stranberg, Environmental Assessment Coordinator, Health Canada
Wendy Harris, Environmental Assessment Officer, Health Canada

Transport Canada / Transports Canada

P.O. Box 8550
3rd Floor, 344 Edmonton Street
Winnipeg, Manitoba
R3C 0P6

Our file Notre reference
R 7075-70-2-56

June 23rdth, 2011

Sean Carriere
Project Manager
Canadian Environmental Assessment Agency
61 Airport Road
Edmonton AB T5G 0W6

Re: Conformity Review of the Inuvik to Tuktoyaktuk Highway Draft EIS

Dear Mr. Carriere,

Transport Canada – Prairie and Northern Region has conducted a conformity review of the Inuvik to Tuktoyaktuk Highway Draft – Environmental Impact Statement (DEIS) and offers the following comments:

- With reference to application requirements of the Navigable Waters Protection Act (NWPA); the information supplied in the DEIS is a good start, but the respective NWPA applications will still require additional information such as watercourse widths, depths, grade, pictures up stream, downstream and across the location(s) intersecting the proposed highway. Also, the watercourse crossing location(s) will need to be referenced in Degrees – Minutes – Seconds.

- Transport Canada – Aboriginal Consultations Unit would like to see for the likely watercourse crossings that Transport Canada may be approving under the NWPA, and through the course of aboriginal consultations with aboriginal groups in the area; any concerns that aboriginal groups may have raised related to the watercourse crossings, possible adverse impacts on their potential or known aboriginal or treaty rights, and any mitigation measures that have been identified to address their concerns.

Should you require any further discussion or clarification on these comments, please contact me by email at john.cowan@tc.gc.ca or by telephone at 204-983-1139.

Sincerely,

John Cowan
Environmental Officer
Prairie and Northern Region

cc: Doug Soloway, Superintendent – EA North, PNR

Canada

Aboriginal Affairs and
Northern Development Canada

Affaires autochtones et
Développement du Nord Canada

Box 1500
Yellowknife, NT X1A 2R3

EIRB File No. 02/10-05

June 27, 2011

Sean Carriere
Project Manager
Canadian Environmental Assessment Agency
61 Airport Road
EDMONTON AB T5G 0W6
Email : sean.carriere@ceaa-acee.gc.ca

Dear Mr. Carriere :

Re : Proposed Inuvik to Tuktoyaktuk all-weather highway: comments on Environmental Impact Statement conformity with Terms of Reference

Aboriginal Affairs and Northern Development Canada (AANDC, formerly Indian and Northern Affairs Canada) has conducted a limited review of the May 31, 2011 Environmental Impact Statement (EIS) in relation to the November 3, 2010 Terms of Reference (TOR) issued by the Environmental Impact Review Board (EIRB) for the proposed Inuvik to Tuktoyaktuk all-weather highway. Comments on specific sections are noted in the attachment. The department relied on the concordance table provided in the EIS (Table E) and in some cases found that the information was difficult to locate. AANDC notes that the final decision on the conformity of any given section with the TOR rests with the EIRB.

AANDC plans to conduct a more detailed review of the EIS during the technical review. The department may propose Information Requests on any section of the EIS falling within the department's mandate, including those which it believes to be in conformity with the requirements of the TOR.

.../2

AANDC wishes to emphasize the importance of the proponents identifying their preferred alignment as soon as possible, in order that all parties and the EIRB may fully understand and consider the potential significant adverse impacts of the project *during the environmental assessment phase*. From reviewing the May 31 EIS, AANDC is unclear as to which alignment will ultimately be the preferred option. Moreover, AANDC understands that the proponents intend to gather additional baseline data this summer, which may lead to revisions to the preferred alignment. In order for AANDC to provide the Board with its best technical advice, the proponents must make the new baseline data and their analysis of the new data available to all parties well before the conclusion of the technical review phase of the assessment.

If you have any questions about AANDC's comments, please do not hesitate to contact Lorraine Seale at (867) 669-2590, email lorraine.seale@inac-ainc.gc.ca, or Conrad Baetz at (867) 777-8901, email Conrad.baetz@inac-ainc.gc.ca.

Sincerely,

Teresa Joudrie
Director, Renewable Resources and Environment

Encls.

Inuvik-Tuktoyaktuk Highway
Review of May 31, 2011 Environmental Impact Statement
for Conformity with EIRB November 3, 2010
Terms of Reference

Aboriginal Affairs and Northern Development Canada (AANDC)
Comments

TOR section	Information Requested, as identified by Proponent in EIS Table E	EIS Location, as identified by Proponent	AANDC comments, based on limited review
4.0	**Executive Summary**	Executive Summary	Appears to meet TOR requirements
5.1	**Introduction to the Developer**, Consultants, Contractors and key personnel that prepared the EIS. Contact information and record of the environmental performance.	1.1, 1.1.1, 1.1.2	Appears to meet TOR requirements although little detail on contractors is provided
5.2	**Contextual Summary of the Development** Brief summary of the development, location, components, phases, spatial extent, temporal extent, workforce, and equipment, associated activities, schedule, and cost.	1.2	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
5.3	**Purpose and Justification**, including any regional and national interests.	1.3	Appears to meet TOR requirements
5.4	**Development Setting** General overview of the geographic, ecological, social, economic and cultural setting and similar information for all considered alternatives.	1.4	Appears to meet TOR requirements
5.5	**Permits and Authorizations** and all land-tenure requirements (including area and ownership), and on any non-regulatory requirements that may be needed for the development to proceed.	**1.5**	Does not appear to meet TOR requirements - Discussion of CEAA process appears to be missing, discussion of AANDC land tenure process appears to be missing, borrow sites require both land use and quarry permits.
5.6	**Study Strategy and Methodology** • Steps in EIS Preparation. • Approach, strategy, and methodology and justification. • Guidance documents or BMP's used or modified for proposed construction and operation – Plus, justification for modifications. How EIRB Goals and Principles were incorporated into the EIS Methodology.	1.6	Unclear from s 1.6 which guidance documents or BMPs were used and if modifications are proposed.

5.6.1	**Traditional Knowledge** How TK influenced assessment results and overall Project design. Includes, • details of how the Developer and TK holders have worked together; • where TK and scientific knowledge differed and how these differences were resolved; • TK Study methodology; • How TK was gathered and verified. • Summary of issues, concerns, and recommendations arising from TK studies. Discusses how, issues, concerns, and recommendations were responded to.	1.6.1, 1.6.3, 1.6.5, 3.1.2, 3.1.9, 3.1.9, 3.1.10, 3.1.10, 4.1.2, 4.3.9, 6.0	Not reviewed in sufficient detail to comment on conformity with TOR requirements.
5.6.2	**Engagement and Consultation** Issues and concerns raised by potentially affected parties, including communities, regulators and other reviewers. How these issues and concerns have been or will be addressed.	1.6.2	Appears to meet TOR requirements
	Summary of the public engagement process in the EIS, including the following: • Community, competent authority or Party contacted; • Contact names; • Dates of contact; • Communication/consultation format ; and • Reason(s) for communication/consultation, and topic(s) of discussion, including the issues and concerns that were raised, and how the issues and concerns were responded to and/or resolved.	1.5, 1.5.1, 1.5.7, 1.5.2, 1.6.1, 1.6.2, 1.6.3, 1.6.4, 3.2.8, 3.2.9, 4.3.5, 4.3.6, 4.3.7, 5.3, Appendix B	Appears to meet TOR requirements
	Any commitments made by the Developer as a result of the communication/consultation.	1.6.1, 1.6.2, 1.6.4, 4.4.3	Appears to meet TOR requirements
	How the planning, design and/or implementation of the proposed development was influenced and/or changed as a result of consultation and by any issues and concerns raised.	1.6.5, 2.1.1, 2.1.2, 2.1.2, 2.2.1, 2.2.4, 2.2.7,4.4.5, 6.0	Appears to meet TOR requirements
5.6.3	**Recognition of IFA and CPP** Potential development affects on the various land categories identified in applicable community's CCP. Demonstration that Developer has reviewed applicable CPPs and consulted with appropriate communities and organizations about any potential conflicts. Mitigation measures and commitments to eliminate potential impacts potentially caused by the development to identified category lands and waters. Environmental Management Integration Plan: demonstration of how information and guidelines from CCPs and other regional plans will be adhered to and complied with.	1.5, 1.6.2, 1.6.3, 3.0, 4.0, 6.0	Not reviewed in sufficient detail to comment on conformity with TOR requirements.
5.6.4	**Sustainability Goals**		Not reviewed

5.6.5	**Precautionary Principle** Identifies which Project components may warrant a precautionary approach. Discusses the potential for serious or irreversible adverse impact to the environment as a result of the Project and how they can be avoided. Describes ways to reduce the risk to the environment, including a discussion of Project design and available technology with respect to effectiveness and cost.	1.6.5, 2.2, 3.0, 4.0, 5.0, 6.0	Does not appear to meet TOR requirements – unclear if any project components were explicitly identified as warranting a precautionary approach.
6	**Detailed Project Description** Plus, required management plans, and management related activities.	1.5, 2.0, 4.0, 6.0, 7.0, Appendix E	Does not appear to meet TOR requirements – for example, management plans for the entire project do not appear to have been provided.
6.1	**Alignment Alternatives** Information on the preferred alignment and the alternatives considered.	2.1, 2.2	Does not appear to meet TOR requirements **–** unclear from 2.1.2 which alignment will ultimately be the preferred option.
	Plus, information on the nature and rationale for any changes since the Project Description submission.	1.6.2, 2.0, 2.1, 2.2	Appears to meet TOR requirements
6.2	**Scope of Project Components and Activities** Description of Project components, their timing, and location.	2.0, 2.6	Appears to meet TOR requirements
	Description of related Project activities, their timing and location	2.0, 2.6, 4.0, 7.0	Appears to meet TOR requirements
	Including as applicable: Construction, operation and maintenance; Closure, decommissioning and restoration; Modification; and Abandonment of permanent and temporary structures.	2.6	Appears to meet TOR requirements
6.3	**Development Phases and Schedule** Location, spatial and temporal extent of Project components and activities as they relate to workforce, roles and responsibilities of governing agencies; and costs	2.7	CEAA decision is not noted in schedule in Table 2.7.2-1 (p.92)
6.3.	1 **New Work and Additional Field Studies Required** Discussion of field work conducted, since filing the Project Description, and any additional field work proposed to be conducted, including a schedule and how results may affect the environmental review and the final decision on the development. Explanation of why this work wasn't included in the current development submission.	2.7.7	Des not appear to include discussion of the field work scheduled to be conducted in summer 2011.
6.4	**Life of the Project** How this development fits with the overall goals, objectives, and long term planning of the Government of the Northwest Territories (GNWT) for Territorial Highways. Including: responsible governing bodies, funding sources, anticipated use, government response to increased use, contribution of the Project to the objectives of the Government of Canada.	2.7.5, 2.8	Unclear if government response to increased use, funding sources, and Government of Canada objectives are fully covered in 2.7.5 and 2.8.
6.4.1	**Other Parties** Roles and responsibilities of the Hamlet of Tuktoyaktuk and the Town of Inuvik to support and promote this development proposal, including long-term management.	2.7.5	2.7.5 does not appear to include a discussion of long-term management responsibilities, if any, of the Town and Hamlet.

7	**Consideration of Alternatives**		
7.1	**Alternative Means of Carrying out the Project** Discussion and analysis of alternative technical and economical options, their feasibility, environmental effects, and how they contribute to sustainable development in the ISR.	1.6.2, 2.1, 2.2, 2.3, 2.4, 2.5, 4.0	Unclear if these sections include discussion of alternative *means* as well as alternative methods.
	Evaluation of relationships and interactions among the various components of the ecosystem, including affected communities.	2.2, 4.0	Appears to meet TOR requirements
	Discussion of environmental effects, and technical and economic feasibility for the preferred option and comparison to alternatives.	2.2, 4.0, Appendix F	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	Criteria and/or constraints used to identify any alternative means as acceptable or unacceptable, and how these criteria and/or constraints were applied.	1.6.2, 2.1, 2.2, 3.0, 4.0	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	Rationale for selection of route and rejection of alternatives. Identification of the environmental effects of the various route alternatives.	1.6.2, 2.2.6, 2.2.7, 4.2	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
7.2	**Alternative Route Options** A description of each alternative route considered and the criteria for selecting them	1.6.2, 2.1.2, 2.2	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	Environmental assessment of the alternatives to substantiate their inclusion as viable alternatives.	2.2, 4.2	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	How or why they are not environmentally, technically and/or economically feasible (constraints), and the rationale for rejecting any alternatives that are excluded from further assessment.	2.1, 2.2, 2.3, 2.7.6	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	How community engagement/consultation, TK and valued components (from the impact assessment) have influenced these determinations.	1.6.1, 1.6.2, 1.6.3	Appears to meet TOR requirements, although unclear which alignment will ultimately be the preferred option
	Answers to the following safety questions: • What makes the preferred alignment safer than the alternative routes? • Which parts of the alternate routes are dangerous and why? • How many dangerous areas are present in each of the three routes? • How much additional risk is posed by these dangerous features, compared to the preferred alignment? • What mitigations can be put in place to alleviate these additional risks?	2.1, 2.2, 2.3, 2.4, 2.7	Unclear if comparison of geometric features meets TOR requirements to identify, discuss mitigations for, and assign costs to dangerous areas

	• What is the cost of these additional risk mitigation features? • What sources of information were used in these determinations?		
8.0	**Key Issues and Study Area Boundaries**		
8.1	**Key Issues** Identification of VCs, for which effects have been predicted, and justification of the methods used to select them.	4.1, 4.1.2	Appears to meet TOR requirements
8.2.1	**Spatial Boundaries** Description of the boundaries used to assess each biophysical or socio-economic element, for all components of the development.	4.1.3	Appears to meet TOR requirements, although boundaries do not appear to vary by VC
8.2	**Study Boundaries** Justification and rationale for all of the study area boundaries	4.1.3	Appears to meet TOR requirements, although a separate rationale for each VC does not appear to have been provided
	Description of the boundaries in a regional context showing existing and planned future land use, surface disturbance, and any current infrastructure.	3.2.9, 4.1.3	Appears to meet TOR requirements
8.2.2	**Temporal Boundaries** Description of temporal boundaries for construction, operation, maintenance, and where relevant, closure, decommissioning and restoration of the sites affected by the development.	2.6, 2.7, 4.1.3	Appears to meet TOR requirements
	Discussion of seasonal and annual variations of environmental components, as applicable, in relation to each phase of the development.	2.6, 2.7, 4.1.3	Does not appear to meet TOR requirements; information may be elsewhere in Section 4?
9	**Existing Environment and Baseline Information**		
	Identification of all potential direct and indirect biological, physical and human elements which could be affected by the proposed development, focusing on relevant issues and considering historical conditions.	3.0	Reviewed for noted sections only (see comments below)
	List of Elements and Goal statements, plus any additional elements identified by the developer. Justification for any deviation from the elements used in the EIRB goals.	4.0	Appears to meet TOR requirements. Unclear if there has been any deviation from the elements used in the EIRB goals.
	Details on any data manipulation, including accuracy assessments, confidence intervals, and margins of error.	3.0	Unclear if this is discussed.
9.1	**Biophysical Environment** Demonstration of the Developer's understanding of the biophysical environment of the proposed development area, through the presentation of appropriate and current data on the following:	3.1	Reviewed for noted sections only
	Terrain, Geology, Soils and Permafrost;	3.1.1	Appears to meet TOR requirements
	Water Quality and Quantity	3.1.5, 3.1.6	Does not appear to meet TOR requirements.
9.2	**Human Environment** Demonstration of the Developer's understanding of the Human environment of the proposed	3.2.9	Unclear to what extent this section incorporates information from AANDC

	development area, through the presentation of appropriate and current data on … Land Use.		and other government sources. p.438, 3.2.9.5 Past and Present Non-Traditional Land Uses - does not include past or present granular material extraction (borrow) sites (pits and quarries)., but some of previous granular resource extraction activity (177, Parsons, 168) in study area is mentioned in 1.5.1 Previous Regulatory Approvals (p.15)
10	**Impact Assessment** Methods used for the environmental effects assessment, in sufficient detail so the reviewers can understand the rationale, logic, assessment process, and how conclusions were reached.	**4.1, 4.2, 4.3, 4.4**	Not reviewed for every VC; see specific comments below.
	Description of environmental effects of all development components over all phases of the development, including long-term operations and maintenance, including: Direct, indirect, reversible, irreversible, short-term, long-term, and cumulative;	4.0, 5.0	Not reviewed for every VC; see specific comments below.
	The location, extent, and duration of affected elements and their overall impact;	4.1, 4.2, 4.3	Not reviewed for every VC; see specific comments below.
	Focus on the biophysical and socio-economic elements (valued components) identified for the development	**4.0**	Appears to meet TOR requirements
	Reference of impacts to elements and goal statements	**4.0**	Not reviewed for every VC; see specific comments below.
	Quantified confidence levels for impact predictions that can be used in follow monitoring programs to verify predictions;	4.0, 5.4.1	Not reviewed for every VC; see specific comments below.
	Consideration of the historic biophysical and human environment conditions in impact assessment and mitigation/ reclamation plans.	1.6.2, 3.0, 4.0, 5.0, 6.0	Not reviewed for every VC; see specific comments below.
10.1	**Biophysical Components** Potential impacts of the Project on physical environment VECs.	4.2	Not reviewed for every VC; see specific comments below.
	Assessment of the Areas of Concern.	4.0	Not reviewed for every VC; see specific comments below.
	The nature of potential impacts and how conclusions were reached, for each VEC.	4.2, 5.4.1	Not reviewed for every VC; see specific comments below.

	Clear description of the path from the baseline (current) conditions, to potential impacts, mitigation, residual impacts and determination of significance.	4.2	Not reviewed for every VC; see specific comments below.
	Consider how natural variation or events (e.g., Climate Change) could affect the descriptions of Project impacts.	2.6, 3.1.2, 4.5	Unclear if meets TOR requirements – is a discussion in relation to each VC required?
10.1.1	**Terrain, Geology, Soils, and Permafrost** Potential impacts of the Project on terrain, geology, soils and permafrost, including a consideration of:		See comments below.
	Slope and soil stability;	4.2.1	Appears to meet TOR requirements
	Erosion on overland low angle sloping terrain;	4.2.1	Appears to meet TOR requirements
	Subsidence;	4.2.1	Appears to meet TOR requirements
	Granular resource extraction areas (include quantity and quality of granular resources);	4.2.1	Does not appear to meet TOR requirements. p.76, 2.6.8.2 Available Info, appears to partially address 10.1.1- background information covering study area is described and locations of potential sites shown on map (Fig. 2.6.8-2) and other info requested in Appendix A is shown for most, but not all, potential borrow sites in close proximity to proposed alignments; p.105, 3.1.1.3 - Borrow Materials - refers to 2.6.8 and indicates some information (depth, permafrost, ice) not yet provided.
	Thaw slumps and compaction of organic peatlands and potential for melt of ice-rich ground;	4.2.1, 4.2.6	Appears to meet TOR requirements
	Drainage beside and beneath the road;	4.2.1, 4.2.4	Appears to meet TOR requirements
	Channelization and non-channelization flow; and	4.2.1, 4.2.4	Appears to meet TOR requirements
	Consideration of mitigation to prevent degradation of permafrost.	2.6, 4.2.1	Appears to meet TOR requirements
	With respect to potential impacts of the Project on permafrost, include the consideration of: • Permafrost as a design feature in the road bed; failure modes analysis and associated • contingency plans; • Thermal condition, active layer thickness, thaw depth, distribution and • Stability; • Ice rich soils (thaw settlement, thermokarst) permafrost thaw and related settlement;	2.6, 4.2.1, 4.2.4	Does not appear to meet TOR requirements.

	• Frost heave of frost susceptible soils in thin permafrost as well as seasonally frozen • soils; • Thaw or settlement-related impacts on drainage and surface hydrology; and • Shorelines, channels, taliks.		
	Combined impacts of the Project and tundra fires.	4.5.4	Not reviewed
10.1.2	Air Quality		Not reviewed
10.1.3	Noise		Not reviewed
10.1.4	**Water Quality and Quantity** Potential impacts of the Project on water quality and quantity, including a consideration of:		See comments below.
	Changes to surface drainage patterns and surface water hydrology including changes caused by Project-related impacts on terrain, soils and permafrost;	4.2.4	Appears to meet TOR requirements
	Hydrogeological resources;	3.1.6, 4.2.4	Appears to meet TOR requirements
	Drinking water quality for humans and wildlife	3.1.5, 4.2.4	Does not appear to meet TOR requirements.
	Recreational water quality;	3.1.5, 4.2.4	Does not appear to meet TOR requirements.
	Discharge or seepage of wastewater effluent, contaminants, chemical additives	4.2.4, 4.3.4, 4.4.3	Does not appear to meet TOR requirements.
	In-stream activities (e.g. watercourse crossings);	4.2.4	Appears to meet TOR requirements
	Changes to water quality at water crossings (bridges, culverts and other wetted areas);	4.2.4	Does not appear to meet TOR requirements.
	Changes to water quality due to thaw slumps;	4.2.4	Does not appear to meet TOR requirements.
	Erosion, sediment deposition, sediment re-suspension;	4.2.4	Appears to meet TOR requirements
	Dust and dust suppression;	4.2.4	Does not appear to meet TOR requirements.
	Increased turbidity;	4.2.4	Appears to meet TOR requirements
	Subsidence	4.2.4	Appears to meet TOR requirements
	Slope stability	4.2.4	Does not appear to meet TOR requirements.
	Flow or water levels including the formation of frost bulbs and related icings at watercourse crossings;	4.2.4	Does not appear to meet TOR requirements.
	Water withdrawal and volume of withdrawal; and	1.5.1, 4.2.4	Appears to meet TOR requirements

	Gravel extraction.	1.5.1, 4.2.4	Does not appear to meet TOR requirements. 1.5.1 gives regulatory requirements, commitment to additional studies and adherence to permits, 4.2.4 addresses only roadway, not borrow sites and their access roads; however, 4.2.5 - Fish and Fish Habitat addresses some similar issues.
10.1.5	Species of Concern		Not reviewed
10.1.6	Fish and Fish Habitat Potential impacts of the Project on VECs related to fish and fish habitat,…		See comments on 10.1.4, Water Quality and Quantity
10.1.7	Wildlife and Wildlife Habitat		Not reviewed
10.1.8	Birds and Bird Habitat		Not reviewed
10.1.9	Vegetation Potential impacts of the Project on vegetation, including consideration of: Alteration or loss of species, or vegetation assemblages that are rare, valued, protected or designated sensitive or important areas or habitat;	4.2.6	Not reviewed, except for section noted below
	How changes might impact permafrost and the highway itself;	4.2.6	Not reviewed
	Changes to the soil, hydrological or permafrost regimes;	4.2.1, 4.2.4, 4.2.6	Appears to meet TOR requirements
	Re-establishment of vegetation and reclamation of borrow sites and other disturbances;	2.6.8, 4.2.6	Not reviewed
	Vegetation control	4.2.6	Not reviewed
10.1.10	Biodiversity		Not reviewed
10.1.11	Country Foods		Not reviewed
10.2	Human Environment Components		Not reviewed
10.2.1	General		Not reviewed
10.2.2	Demographics		Not reviewed
10.2.3	Regional and Local Economies		Not reviewed
10.2.4	Education, Training and Skills		Not reviewed
10.2.5	Infrastructure and Institutional Capacity		Not reviewed
10.2.6	Human Health and Community Wellness		Not reviewed
10.2.7	Socio-Cultural Patterns		Not reviewed
10.2.8	Harvesting		Not reviewed
10.2.9	Land Use Potential impacts of the Project on land use, including a consideration of various land uses, including: Traditional use; Tourism and changes in tourism access; Industrial use and changes in access;	3.2.9, 4.3.8	Appears to meet TOR requirements

	Patterns of use and changes in these patterns;	3.2.9, 4.3.8	Does not appear to meet TOR requirements. p.438, 3.2.9.5 Past and Present Non-Traditional Land Uses - does not include past or present granular material extraction (borrow) sites (pits and quarries).
	Impacts on particular sites or features	3.2.9, 4.3.8	Appears to meet TOR requirements
	Conformity of proposed Project-related land uses with designated land use management areas as described in approved and draft management plans, community conservation plan, and proposed land use designations and identification of discrepancies.	3.2.9, 4.3.8	Does not appear to meet TOR requirements. 3.2.9.6 Proposed Future Land Uses - borrow sites proposed for use by MGP and related facilities (Parsons Lake) are available and should be shown on Fig. 3.2.9-6, as well as any other sites designated in ISR Granular Management Plan
	An evaluation of the potential impacts of the Project on protected areas and special management areas, including a consideration of the following: • Community conservation plans; • Regional land use plans; • Existing and proposed protected areas; • Special management areas; • Other proposed special management areas such as parks, sanctuaries or preserves; and • Implementation of plans, action plans, strategies and guidelines.	3.2.9, 4.3.8	Unclear if meets TOR requirements. If some of these elements do not exist within the project area, a statement to that effect is recommended.
10.2.10	Heritage Resources		Not reviewed
10.3	**Potential Accidents and Malfunctions** Possible accidents or malfunctions, their probable and potential effects on the environment, including impacts on social, economic, and cultural elements of the environment and human health to people in close proximity of accidents or malfunctions, including spills of contaminants for the life of the Project.	4.4	Unclear if meets TOR requirements to discuss social, economic and cultural impacts
	The process for the implementation of any mitigation measures or contingency plans.	4.4.5	Unclear if meets TOR requirements – more details could be useful
	Discussion of the developer's commitment to having an Environmental Protection Plan (EPP) and Emergency Response Plan (ERP) that would address potential accidents and malfunctions for the life of the Project.	4.0, 4.4, 6.0, Appendix E	Appears to meet TOR requirements

	Sensitive elements, including those identified in the IFA and CPPs, of the environment that could be affected in the event of an accident or malfunction over the life of the Project.	4.4	Unclear if meets TOR requirements – unable to locate discussion of sensitive elements in section 4.4.
	The probability of impacts, taking into account weather or extreme external events that present contributing factors.	4.4, 4.5	Does not appear to meet TOR requirements
	For each Project phase, the potential accidents or malfunctions that may occur as a result of the Project.	4.4	Does not appear to meet TOR requirements
10.4	**Effects of the Environment on the Project** The effects of the environment on the Project.	4.5	Appears to meet TOR requirements
	How the Project is engineered and designed to integrate into its environmental surroundings and operate safely and reliably over its life.	4.5	Unclear if meets TOR requirements
	How physical and biological changes in the environment could have implications for the Project.	2.4, 4.5	Unclear if meets TOR requirements
10.5	**Determination of Significance** Approaches used to determine the significance of effects for each biophysical or socioeconomic element assessed	4.1	Appears to meet TOR requirements, although the discussion of level of consequence and magnitude should include an explicit discussion of significance
	Definition of impacts in terms of magnitude, geographic extent, duration, and frequency.	4.0, 4.1	Appears to meet TOR requirements, although the discussion of level of consequence and magnitude should include an explicit discussion of significance
	Justification and rationale for thresholds relating to the impacts criteria and how the impacts criteria inform the assessment about the significance of impacts, under the assumption that mitigation measures will be implemented successfully.	4.1, 4.2, 4.3, 5.4.1	Unclear if meets TOR requirements
	Positive and negative impacts.	4.1, 4.2, 4.3, 5.4.1	Appears to meet TOR requirements
11	**Cumulative Effects** Assessment of cumulative effects, showing that long-term cumulative effects are adequately considered and can be successfully mitigated.	5.0	See comments below.
	Discussion of the incremental contribution of all projects or activities (including operation of the hwy) in the delineated Study Area(s), and of the Project alone, to the total cumulative effect on the VEC or VSC over the life of the Project.	5.0	Appears to meet TOR requirements
	Spatial and temporal boundaries for the cumulative effect assessment for each VEC selected.	5.1, 5.2	Appears to meet TOR requirements; EIRB will need to decide on appropriateness of temporal boundary

	Analysis of impacts of Project activities when they are combined with the impacts of other past, present, and future projects and activities.	5.3, 5.4	Appears to meet TOR requirements
	Different types of potential impacts, different forms of effects, such as synergistic, additive, induced and spatial or temporal overlap; and impact pathways and trends.	5.0, 5.4.1	Unclear if meets TOR requirements – for example, is a discussion of pathways required? No such discussion appears to be included in Section 5.
	Rationale for the process chosen to carry out the cumulative effects assessment; and description of, and rationale for, the approach and methods used to identify and assess cumulative effect; and the approach of the assessment in the context of the IFA and updated CCPs.	5.0	Unclear if meets TOR requirements
	Identification and justification of (VECs or VSCs) for all Project components involved in the cumulative effects assessment, including those for alternative routes.	4.1, 5.4	Unclear if meets TOR requirements – are alternatives included in the CEA?
	Evaluation of the potential for this Project to catalyze future projects and the effects these potential projects and the associated loss of remoteness.	1.3, 2.8, 3.2.8, 4.3.2, 5.3, 5.4.1, Appendix F	Appears to meet TOR requirements
	Contribution of the Project to a total potential cumulative effect.	5.3, 5.4	Appears to meet TOR requirements although discussion in 5.4.1 is somewhat unclear.
	Potential cumulative Project effects in a regional context, considering regional plans, community conservation plans, species recovery plans, management plans, objectives	5.3, 5.4	Unclear if meets TOR requirements
	Identification of any changes in the original environmental effects and significance predictions for the Project.	5.4	Appears to meet TOR requirements
	Effectiveness of the proposed mitigation and/or other restitution measures, the response to such changes, and implications for monitoring and follow-up programs.	4.0, 5.4, 6.0, 7.0	Unclear if meets TOR requirements – see comments on monitoring and follow-up
	Proposed management tool(s) for cumulative effects resulting from the proposed Project.	4.0, 5.4, 6.0	Appears to meet TOR requirements
12	**Mitigation, Mitigative and Remedial Measures, and Worst Case Scenario**		See comments below.
	Examination of all mitigation measures, identified during the impact assessment to identify development impacts that could affect wildlife harvesting, from a worst case scenario perspective.	4.2.7, 4.3.7, 4.3.8, 4.4.5	Not reviewed.
	Discussion and conclusions reached in this chapter are necessary to address the specific requirements of the IFA and have been requested for liability/compensation purposes.	4.4.5	Appears to meet TOR requirements

12.1	**Mitigation**		
	Summary table of detailed mitigation commitments of the Developer, including: measures, implementation methods, identified impacts and VCs.	4.2, 4.3, 6.0	Need to know if this table has been cross-referenced with Table F, Developer's Commitments before commenting on conformity
12.2	**Mitigation and Remedial Measures -** Mitigative and remedial measures designed to reduce or eliminate negative impact to wildlife, wildlife habitat and wildlife harvesting in the EIS.		Not reviewed.
12.2.2	**What Developers Shall Consider**		
	A description of any potential impacts to the biophysical and human environment, wildlife, wildlife habitat, and wildlife harvesting activities. 4.2.7, 6.0	4.2, 4.3, 5.4, 6.0	See comments on specific VCs above.
	A description of the proposed mitigation to reduce or eliminate potential impacts.	4.2, 4.3, 6.0	Appears to meet TOR requirements
	Measures to address sensory disturbances to wildlife, particularly barren-ground caribou and grizzly bear.\	4.2.7, 6.0	Not reviewed.
	An outline of emergency response plans and any management and monitoring plans proposed and/or required for the development to proceed.	4.0, 4.4, 6.0, Appendix E	Does not appear to meet TOR requirements. For example, environmental management plans for the entire project do not appear to have been provided.
	Where appropriate, a clear indication of the party responsible for implementing the mitigation.	2.7.5, 4.0, 6.0	Appears to meet TOR requirements
	Mitigation to reduce the potential negative effects of a development	4.2, 4.3, 6.0	Appears to meet TOR requirements
	Measures that are built into the design of the development can be included in the discussion of development activities.	1.6.2, 2.6, 3.0, 4.0	See comments on specific VCs above.
	Rationale for mitigation measures and examples of where these measures have been used effectively.	2.6.1, 4.2, 4.3, 6.0	See comments on specific VCs above.
12.3	**Worst Case Scenario** Worst case scenario estimate for negative impacts to wildlife, wildlife habitat and wildlife harvesting, as a result of the proposed development.	4.4.5	Appears to meet TOR requirements
12.3.2	**Wildlife Compensation, Liability and Worst Case Scenario** The Developer's potential Liability, based on worst case scenario. If there is a possibility that damage to wildlife or wildlife habitat may occur as a result of the Project, the EIRB must recommend terms and conditions relating to mitigative and remedial measures that are necessary to minimize the negative impact of a proposed development on wildlife harvesting. The Worst Case Scenario will be used to calculate a security amount to be held by the federal Minister.	4.4.5	Appears to meet TOR requirements, subject to comment about restoration below.

12.3.4	**Wildlife Habitat Restoration** Restoration includes post-development measures that would enhance recovery of harvested populations to pre-development levels. Determining the practicality and potential costs of restoration resulting from a "worst case scenario".	4.4.5	Does not appear to meet TOR requirements – unable to locate discussion of restoration after a worst case scenario.
13	Follow-up and Monitoring "Follow-up" program for verifying the accuracy of the environmental assessment of the Project, and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the Project, including: • Regulatory and non-regulatory monitoring requirements for the life of the Project; • Purpose of each program, responsibilities for data collection, analysis and • dissemination, and how results will be used in an adaptive management process; and • How Project-specific monitoring will be compatible with the NWT CIMP or other regional monitoring programs.	4.0, 7.0	Does not appear to meet TOR requirements. For example, regional monitoring programs are mentioned but there does not appear to be a discussion of integration with project specific monitoring.
13.1	**Environmental and Socio-Economic Effects Monitoring** Table with effects monitoring requirements, including: effects, indicators and parameters for each effect or concern; and the target or management goal.	7.0	Does not appear to meet TOR requirements – no table in Section 7.0
13.2	**Compliance Monitoring** Environmental Monitoring Inspection Requirements Table, that includes: • Current conditions of any applicable permits, licenses and approvals; • The frequency, nature, and period of time of inspections; and • Demonstrates how the terms and conditions set out in regulatory approvals, licenses and permits, and in the commitments submitted by the Developer will be adhered to and met and will be used by the environmental monitoring to verify and report the work being done.	7.0	Does not appear to meet TOR requirements
13.3	**Environmental Management Plans** Environmental management plans for specific areas of concern to meet environmental goals for life of the Project, including: • Methods for the implementation of mitigation measures; • Methods for the monitoring of mitigation effectiveness; • Reporting mechanism on goals; and • Incorporation of plans identified by the Developer in the EIS as being required and other plans deemed necessary.	7.0 4.2, 4.3, 6.0, 7.0, Appendix E	Does not appear to meet TOR requirements. For example, environmental management plans for the entire project do not appear to have been provided.
	Socio-economic and Cultural Effects Management, Policies, and Commitments		Not reviewed
14	**References**		Appears to meet TOR requirements