



Mr. Simon Toogood
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
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YELLOWKNIFE NT X1A 2N7

OCT 27 2017

Dear Mr. Toogood:

EA1617-01 Tłıchǰ All-season Road: Government of Northwest Territories' Response to Technical Reports

Please find enclosed the Government of Northwest Territories' (GNWT) responses to Technical Reports that were received as a part of the Tłıchǰ All-season Road's (TASR) environmental assessment (EA). The GNWT has responded to Technical Reports from the following parties:

- Fisheries and Oceans Canada;
- Environment and Climate Change Canada;
- Natural Resources Canada;
- North Slave Métis Alliance (NSMA);
- Wek'èezhì Renewable Resource Board (WRRB); and
- Yellowknives Dene First Nation.

Please note that the GNWT will be responding by November 1, 2017 to the WRRB's Technical Report for Boreal Caribou, which was submitted on October 23.

The GNWT has not provided a separate response summary to the Tłıchǰ Government's Technical Report as the GNWT acknowledges the Tłıchǰ Government's comments and agrees to the new commitments that were proposed in Appendix E of the report. The GNWT will continue to work closely and collaboratively with the Tłıchǰ Government over the course of the proposed project. The GNWT will comply with the conditions of any permits and licences that may be issued for the project. It is the GNWT's position that no significant adverse environmental impacts are likely to occur during the development and operation of the TASR that cannot be mitigated based on our assessment.

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Project impacts will be adaptively managed through the Wildlife Management and Monitoring Plan and all additional management plans that the GNWT has committed to during this EA.

It is also the GNWT's position that the foremost purpose of the Project is to improve quality of life, community access and economic development for the Tłıchǫ citizens, residing in the Tłıchǫ Lands, by improving the mobility of the Tłıchǫ citizens to and from Whatì. This position is mirrored by the Tłıchǫ Government in several documents including its cover letter to its technical report where it states the "Tłıchǫ Government, its departments and agencies stand behind the TASR as a community-driven project that will contribute to the growth, prosperity and longevity of Whatì, its residents and Tłıchǫ citizens" (PR#216).

The GNWT recognizes that the response to Technical Reports represents a large amount of information. The GNWT has made additional commitments and/or provided new information in response to the Technical Reports. To help parties and the Mackenzie Valley Environmental Impact Review Board, the GNWT would like to highlight some of the new commitments and provide clarity on the status of the GNWT programs discussed during this environmental assessment:

Corridor Working Group

- The GNWT commits to establishing an overarching corridor working group that is similar to the GNWT's highly successful Inuvik Tuktoyaktuk Highway Corridor Working Group (ITHCWG). This commitment was made in response to the WRRB's Technical Report and its recommendation of a collaborative Independent Oversight Committee, which the GNWT opposes. The GNWT opposed a similar recommendation for an independent oversight committee in its Response to the Inuvik Tuktoyaktuk Highway Project Review Panel Report. This report has been filed on the public registry for this EA. In the end, the Review Panel agreed to the establishment of the ITHCWG.
- To help inform parties of what the ITHCWG entails, the terms of reference, a set of meeting notes, and draft meeting agenda for the ITHCWG have been filed on the public registry for this EA. These documents outline that the intent of the working group is to be an information sharing mechanism for the developer to report on the project and to review outcomes of the multiple environmental management and monitoring plans with invited interested parties. The proposed corridor working group for the TASR project would be developed in consideration of the ITHCWG terms of reference.

Resource and Wildlife Management

- The GNWT commits to the mitigation hierarchy described in the Adequacy Statement Response Section 2.31 as it relates to managing the impacts of this project on wildlife and their habitat. The GNWT commits to follow the reclamation guidelines in the Northern Land Use Guidelines: Pits and Quarries, which were developed with a view to increasing the probability of re-vegetation in these areas. The GNWT commits to pursuing and supporting research that would support identification of viable offsetting projects, when and where they are appropriate. This commitment was made in response to the WRRB's Technical Report.
- The GNWT is in the process of studying the utility, effectiveness, and legal implications of potential offsetting approaches in the context of regulatory decision making and range planning for boreal caribou and barren-ground caribou, including when and where it is appropriate and how it might be undertaken by the developers. The GNWT is undertaking this work with a view to developing a policy and guidelines around the use of offsets for mitigating residual impacts from developments. Until this work is completed, the GNWT cannot commit to the implementation of specific offsets for the TASR project.
- The GNWT clarified that once it is operational, the TASR will be managed like any other Northwest Territories (NWT) highway. As it will be a public road, in general, traffic will not be stopped because wildlife are near the road; however, section 4.4.2 of the WMMP identifies that the GNWT has the ability to install temporary portable signage (e.g., that could indicate a road closure for the purposes of public safety) and temporarily lower speed limits on parts of the TASR if a localized wildlife collision hazard is present. This clarification was made in response to the NSMA's and WRRB's Technical Reports.
- In the next version of the WMMP, the GNWT will update the sensitive period for boreal caribou calving to include the post-calving period. The new sensitive period for boreal caribou calving will be April 05 – July 15. This commitment was made in response to the NSMA's Technical Report.
- A table summarizing specific mitigation and monitoring for bison and moose during sensitive periods will be considered for the next version of the WMMP. This commitment was made in response to the NSMA's Technical Report.
- The GNWT will change the sensitive period for bison to March 01 – July 15 in the next version of the WMMP. This commitment was made in response to the NSMA's Technical Report.
- The GNWT would also like to ensure that parties are aware that the Minister of Environment and Natural Resources (ENR) requires that the Department of Infrastructure (INF) submit a WMMP for approval at least 60 calendar days prior to construction of the TASR.

ENR will post the submitted WMMP for public review for 30 calendar days. Further details are provided in ENR's October 16, 2017 letter to INF ([PR#225](#)).

Land Recreational Leasing Management Framework

- In their Technical Report, the Tłıchǵ Government highlighted the GNWT priorities associated with the development of the Recreational Leasing Management Framework (RMLF). For the purpose of clarification, the GNWT is now referring to the "Recreational Land Management Framework" as the "Recreational Leasing Management Framework" (released March 16, 2017).
- The Framework articulates the GNWT's goals and priorities with respect to the planning, management, administration, and issuance of leases for cabins and recreational uses.
- A priority for the GNWT Department of Lands is to promote and support the development of effective land use plans in areas where none exist. The Department of Lands is working collaboratively with the Tłıchǵ Government and the Government of Canada to examine possible next steps in creating a Wek'èezhì Area Land Use Plan for public lands.
- A land use planning process in the Wek'èezhì Management Area would consider social, cultural, ecological and economic values in a holistic manner that supports the sustainable use of land and reflects community interests and aspirations.

Ground Ambulance and Highway Recue Services Action Plan

- The purpose of the Ground Ambulance and Highway Rescue Services Action Plan project is to examine current ground ambulance and highway rescue services in the NWT for the purpose of determining an acceptable standard of service and the necessary resources to maintain the desired service level. Ultimately, the goal is to establish a common vision for ground ambulance and highway rescue services in the NWT, including an action plan to guide system maintenance and development.
- The Action Plan will be a multi-Departmental collaboration among Municipal and Community Affairs, Health and Social Services, Infrastructure and Justice. It will contain immediate actions that can be achieved within existing resources and may propose future actions that will require new resources in the longer term. The scope of the project is limited to communities with established ground ambulance and highway rescue services, and results will inform longer term planning involving NWT communities situated near territorial highways.

- The Action Plan will involve a close look at the Multi-Agency Rescue Coordination System (MARCS) to determine whether this tool is adequately serving its intended purpose, which is to establish a basic architecture for facilitating on-scene command and control, coordinating resources, and integrating multiple agencies for incidents and emergencies on NWT highways. Should the operational assessment indicate that MARCS should be replaced or changed, this will be carefully considered in the development of a GNWT action plan in support of community-based grounds ambulance and highway rescue services.
- The Action Plan work is well underway with face-to-face interviews complete for several key NWT communities including Behchokò. Interviews with municipal officials in Whatì will be conducted in November 2017.

Stable and Healthy Communities

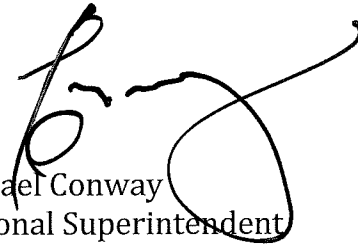
- In their Technical Report, the Tłıchq Government highlights a range of issues related to stable and healthy communities and their concerns that the TASR will exacerbate existing social issues. The GNWT has worked and will continue to work with the Tłıchq Government on these issues. The GNWT works to continuously improve programs and services and promote mental health and addictions recovery in the territory.
- The GNWT developed a comprehensive Mental Health and Addictions Strategic Framework (“Mind and Spirit”) to serve this purpose. The GNWT provides a range of options for residents suffering from substance abuse and addictions to ensure that residents have access to a broad and flexible range of addictions treatment services within available resources. This includes: community based counselling and addictions support; on the land healing programs; culturally based community wellness programs; and facility based treatment. In addition to this, the GNWT implements promotion and prevention programs to raise awareness and reduce stigma, including: Mental Health First Aid Training; Talking about Mental Illness – a school-based program; and, Applied Suicide Intervention Skills Training.
- The GNWT will continue to work closely with the Tłıchq Government, Tłıchq Community Services Agency, non-profits, and other partners to support vulnerable populations and to provide programs and services directed at improving the health and well-being of vulnerable groups in the Tłıchq region and throughout the NWT. The GNWT Department of Health and Social Services (HSS) routinely tracks the health status of residents in the territory and delivers programs and services to meet their needs.

- HSS will continue to use the existing monitoring programs and mechanisms in place to ensure that any potential negative impacts identified through our monitoring strategies are identified and mitigated. HSS recently tabled the Continuing Care Action Plan, which includes five objectives centred around: optimizing healthy aging; home and community care services; long-term care; palliative care and sustainable best practices and culturally safe care.

The GNWT would like to thank all the parties for their comments and recommendations included in their Technical Reports. The GNWT is willing to discuss our responses to the Technical Reports in more detail with interested parties, upon request, prior to the Public Hearings. The GNWT looks forward to participating in the Public Hearings and the remaining stages of the EA process.

If you have any questions or comments, please contact me at (867) 767-9089 ext. 31194 or by email at Michael_Conway@gov.nt.ca at your earliest convenience.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Conway', with a large, stylized flourish extending to the right.

Michael Conway
Regional Superintendent
North Slave Region
Department of Infrastructure

Attachments

Tłıchǫ All-Season Road

GNWT Technical Report Responses to Fisheries and Oceans Canada

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tłıchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Other relevant documents submitted to the MVEIRB public registry for EA1617-01 are listed below and referenced by their public registry number (e.g., the PDR is referred to as [PR#43](#), and the ASR is referred to as [PR#110](#)).

Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokq from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, including Fisheries and Oceans Canada (DFO), for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01. The report dated 17 March 2017 ([PR#109](#)) summarizes the GNWT-DFO meeting on 15 December 2016, and includes a follow-up submission of information requested by DFO on fish habitat per each of the proposed crossings.

On 11 October 2017, the Fisheries and Oceans Canada (DFO) submitted their technical report to MVEIRB for the TASR Project ([PR#221](#)) outlining recommendations on remaining topics of concern. This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

2 RESPONSES

2.1 Watercourse Crossings

The GNWT would like to thank DFO for their participation in a site visit to evaluate fish habitat at stream crossings 1.1 to 13 that occurred on 20 to 21 September 2017. The stream crossing survey was in response to commitments made by the GNWT during the Technical Session in Behchokò (commitments #7 and #14, [PR#171](#)). The survey team was also accompanied by harvester John Beaverho, representing the community of Whatı. The technical memorandum summarizing the results from the fish habitat survey was submitted to the public registry on 25 October 2017 ([PR#235](#)).

The GNWT notes that the results from this survey confirmed for DFO the accuracy of the watercourse characterizations for fish habitat, as described in the PDR and the ASR ([PR#43](#) and [#110](#)). Further, DFO concludes in the Technical Report ([PR#221](#)) that the TASR water crossings can be managed such that significant impacts to fish and fish habitat can be avoided.

The GNWT reiterates its commitment to implementing all relevant DFO guidance, and looks forward to working with DFO and other co-management parties during the permitting stage of the TASR Project. At that stage the TASR Fish and Fish Habitat Protection Plan ([PR#43](#)) and crossing designs for locations where there is potential for serious harm to fish will be updated accordingly and submitted to DFO.

2.2 Fisheries Management and Harvesting

The GNWT notes that the DFO Technical Report ([PR#221](#)) confirms that it is the responsibility of DFO and its co-management partners to manage fisheries resources along the TASR, as is currently done elsewhere in the Northwest Territories. The co-management partners for waterbodies along the TASR corridor include the Wek'èezhì Renewable Resources Board (WRRB), DFO, Tłıchq Government and associated communities.

Calculations completed on behalf of the GNWT indicate that additional recreational fishing on waterbodies accessible by the TASR (including Lac La Martre) is sustainable ([PR#159](#), [PR#211](#)). To assist with the management of the fishery, the Tłıchq Government has committed to working with DFO to develop a strategy to monitor and manage impacts to fisheries that may occur when the TASR is operational, including a creel survey for the first three years of operation ([PR#216](#)).

The GNWT notes that the DFO Technical Report ([PR#221](#)) also confirms DFO's commitment to engage with the co-management boards and affected Aboriginal groups to acquire relevant fisheries information, to identify priority Aboriginal subsistence waterbodies where harvesting pressure may change as a result of increased access from the development of the TASR, and to ensure that potential impacts are managed. It is expected that DFO will continue to lead such engagement efforts for fisheries management in the region. The GNWT looks forward to participating in this process.

Tłıchǫ All-Season Road

GNWT Technical Report Responses to Environment and Climate Change Canada

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tłıchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokò from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01.

On 11 October 2017, the Environment and Climate Change Canada (ECCC) submitted their technical report to MVEIRB for the TASR Project ([PR#218](#)) outlining recommendations on remaining topics of concern. This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

To facilitate cross-referencing with the PDR and other relevant documents already submitted to the MVEIRB public registry for EA1617-01, this document refers to documents by their public registry number (i.e., the PDR is referred to as [PR#43](#)).

2 RECOMMENDATION AND RESPONSE

2.1 Aquatic Environment: Acid Rock Drainage and Metal Leaching

2.1.1 Recommendation (ECCC's recommendation 4.1.1-1)

ECCC is satisfied with the Proponent's commitments regarding Issue 4.1.1, Acid Rock Drainage and Metal Leaching ([PR#171](#)) and has no further recommendations or outstanding concerns on this issue at this time.

2.1.2 Response

The GNWT concurs with ECCC's recommendation pertaining to acid rock drainage and metal leaching. A draft copy of the geotechnical investigations for borrow sources has been posted to the public registry in nine parts (PR#200, #201, #202, #203, #204, #205, #206, #207, #208). This draft report includes the results from the geochemical analysis, which was conducted following MEND Report 1.20.1. It is expected that the report will be 'Issued for Use' in November; only minor changes are expected. All samples analyzed were classified as non-acid generating; total sulphur was low and variable in the bedrock samples; and trace element concentrations were low.

2.2 Aquatic Environment: Erosion and Sediment Control

2.2.1 Recommendation (ECCC's recommendation 4.1.2-1)

ECCC is satisfied with the Proponent's commitments regarding Issue 4.1.2, Erosion and Sediment Control ([PR#171](#)) and notes that the ESC Plan, response measures and lessons learned including requirements for monitoring, reporting and adaptive management from other northern projects could be reviewed during the regulatory phase if they are provided upfront with the Water Licence Application.

2.2.2 Response

The GNWT acknowledges ECCC's recommendation pertaining to erosion and sediment control. Upon the release of the MVEIRB's Report of Environmental Assessment, it is expected that the WLWB will issue a Request for Information letter to the GNWT outlining what details are required in the post-EA information package for permitting purposes. The GNWT will resubmit its application in accordance to the WLWB's Request for Information. As has been outlined in previous request for information letters from the WLWB (such as [W2013L2-0002](#)), the post-EA information package can contain management and/or design plans that are conceptual in nature with the understanding that the updated/finalized plans will

be submitted to the WLWB for approval, after the water licensing process has been completed.

2.3 Aquatic Environment: In-Field Water Analysis Monitoring Plan

2.3.1 Recommendations (ECCC's recommendations 4.1.3-1 and 4.1.3-2)

1. ECCC recommends that the Proponent add water quality monitoring pre-construction, during freshet and immediately after heavy rainfall events to the sampling regime for water crossings in the updated In-Field Water Analysis Monitoring Plan.
2. Depending on the site and how vulnerable or prone to erosion the site is, ECCC recommends, that at a minimum, the Proponent complete monitoring the following freshet, summer and late fall. If there are no issues then this could revert to the general road inspections. If instability or erosion is detected, ECCC recommends that monitoring and mitigation take place again in the next year in all three seasons. This monitoring should be outlined in the updated In-Field Water Analysis Monitoring Plan.

2.3.2 Responses

These changes will be considered in the next version of the In-Field Water Analysis Monitoring Plan ([PR#43](#)) and the TAsR Erosion and Sediment Control Plan during the regulatory phase. The GNWT has already made commitments to update the In-Field Water Analysis Monitoring Plan, listed in the response to MVEIRB IR#21 ([PR#146](#)), and reiterated here:

- The In-Field Analysis Plan can be updated to indicate the management actions that would be implemented depending on the difference between the upstream and downstream turbidity levels (including immediate response triggers such as more frequent monitoring and assessment of mitigation measure).
- The In-Field Water Analysis Plan will be updated to include an appendix with the locations of the watercourse crossings and associated station numbers to be set up at the commencement of construction.
- The In-Field Water Analysis Plan will be updated to include one set of confirmatory TSS (during construction around immediate water crossing) to identify the ballpark relationship of TSS and turbidity at each site.

- Water quality grab samples upstream and downstream of the four major water crossings can be added to the In-Field Water Analysis Plan to demonstrate best water quality management practices.
- The Plan will be updated to include grab samples of TSS at select sites/time periods over the course of construction to ensure turbidity testing remains comparable. Baseline data will be collected upstream of the construction activity at the same time as the downstream samples to provide surety of any difference in turbidity levels.

2.4 Terrestrial Environment: Avian Species at Risk – Impact Assessment

2.4.1 Recommendation (ECCC’s recommendation 4.2.1-1)

ECCC recommends that in the absence of surrogate data, the Proponent complete baseline monitoring of avian species at risk prior to Project construction to inform and add sufficient confidence to the avian species at risk impact assessment.

2.4.2 Response

The ASR includes a list of the anticipated avian species of concern, developed in consultation with ECCC. In developing this list, the ASR and the Wildlife Management and Monitoring Plan (WMMP) followed ECCC guidance (ECCC 2017) that species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) should also be included in the assessment, by way of best practice, despite the fact that these species do not have the legal status afforded by the *Species At Risk Act* or the *Species At Risk (NWT) Act*.

In the absence of information suggesting otherwise, the ASR assumed that each of these species were present in the TASR study area. Further to this, if baseline studies had been completed and some of the avian species at risk were not detected, they likely would have been included in the ASR effects assessment anyway, to provide a conservative assessment and as some of the species are difficult to detect or occur at low densities.

While baseline studies would have improved the detail of the impact assessment, they would not have changed the conclusion of the assessment that the Project is not anticipated to cause significant adverse effects to migratory birds or species at risk. The Project includes mitigation in its design (by using an existing trail), the impact assessment included sufficiently conservative assumptions (e.g., that all potential quarries would be developed, which likely won’t be the case), and the WMMP outlines the typical mitigation for such developments and includes ECCC

recommendations to-date (such as favoring vegetation clearing outside of the migratory bird nesting season, and completing pre-clearing nest sweeps if this is not feasible). Baseline studies would have confirmed that the impact assessment is precautionary, that Project effects are over-estimated, and may have indicated that some of the species of concern are not present. Further, the WMMP indicates how the GNWT and Project Co. will meet all applicable legislation (i.e., the *Migratory Bird Convention Act*, the *Species At Risk Act*, the *Species at Risk (NWT) Act*, the *Mackenzie Valley Resource Management Act* and the *Wildlife Act*) once construction begins. The GNWT has confidence in the conclusion that the Project will not cause significant adverse effects to migratory birds or species at risk when the proposed mitigation is implemented.

Despite this overall position, the GNWT will contact ECCC to schedule a meeting prior to the public hearing to continue the discussion of baseline monitoring of avian species at risk so that the GNWT can further understand ECCC's recommendation.

2.5 Terrestrial Environment: Avian Species at Risk – Mitigation and Monitoring at Quarries and Borrow Species

2.5.1 Recommendation (ECCC's recommendations 4.2.2-1 to 4.2.2-5)

1. To determine the presence of avian species at risk, ECCC recommends that the Proponent perform avian species at risk nest monitoring at quarry and borrow sources immediately prior to commencing any disruptive activities during the general nesting period.
2. ECCC recommends that the Proponent contour quarries and borrow source piles to have a slope of less than 70 degrees. During the breeding season, ECCC recommends that the Proponent flatten vertical faces at the end of each work day in active areas to prevent avian species at risk from digging borrows in them overnight or on the weekends.
3. During the breeding season when active colonies are discovered, ECCC recommends that the Proponent prevent disturbance by marking off a protective buffer zone around the colony and notifying employees of its existence. If colonization occurs in an active area all excavation work, including blasting, should stop and not resume until the end of the breeding period when the birds have left.
4. ECCC recommends during the pre-development site planning that the Proponent consider creating suitable habitat in inactive areas away from activities with vertical faces of at least 70 degrees prior to the breeding season.

5. ECCC recommends that if a recently-used quarry or borrow source needs to be excavated after it has been colonized and the birds have left, then the Proponent compensate by providing an alternative site that can support nesting in the following year.

2.5.2 Responses

Response to Recommendation 1 (ECCC's recommendation 4.2.2-1)

As per the WMMP, surveys for avian species at risk will be completed weekly at least, and include the borrow pits. Frequency of monitoring would increase if the Bird Nest Monitoring (WMMP Section 5.1.4) indicates a potential for nesting. Quarry slopes will be contoured to less than 70 degrees, as per the guideline for Bank Swallows in Sandpits and Quarries, and as committed to in the WMMP. Should nests be identified, the WMMP states that these will be reported to ECCC (WMMP Section 6.1.1) and that a protective radius will be created around any nests identified (WMMP Section 4.1). If vegetation clearing is required during the migratory bird nesting season, pre-nesting surveys will be completed and ECCC will be consulted (WMMP Section 4.1).

Response to Recommendation 2 (ECCC's recommendation 4.2.2-2)

The WMMP describes how the guideline for Bank Swallows in Sandpits and Quarries, which recommends that quarries and borrow source piles to have a slope of less than 70 degrees, is currently considered as part of the GNWT highways operations (WMMP Section 2.5.1) and that this current practice will be extended to the TASR (WMMP Section 4.4.1). Nevertheless, the requirement to for the slope of less than 70 degrees will be explicitly mentioned in the next version of the WMMP. As quarry operations may extend into the weekends and evenings, in these instances it will not be possible to flatten the vertical faces according to ECCC's suggested schedule. Consideration can be made to flatten vertical faces according to an achievable schedule. It is currently common practice to flatten the slopes at non-continuous GNWT operations; however, this is not applicable to bedrock quarries.

Response to Recommendation 3 (ECCC's recommendation 4.2.2-3)

This mitigation is already included in the WMMP (Section 4.1.1); however, the GNWT is willing to have further discussions with ECCC on this topic prior to the WMMP finalization. Relevant mitigation in the WMMP include:

- Avoid disturbance or destruction of bird nests and eggs by clearing land outside of the bird nesting and fledging season (May to mid-August); however, if vegetation clearing is required within this time, pre-clearing nest surveys will be completed and no-work zones will be observed for identified active nests. Through consultation with ENR and ECCC, bird nests will be protected by a buffer that protects the nest while allowing construction to continue, and will be monitored weekly. Details of nests identified and the mitigation will be included in the weekly wildlife monitoring reports.
- Birds will be deterred from nesting on infrastructure by placing covers/screens on vents, holes, and crevices where birds could potentially nest, and if necessary through active (but non-lethal) disturbance of birds to discourage them from establishing a nest on a construction site. If bird nesting occurs, the nest will not be disturbed until after the birds have left the area, with clearance to be discussed in consultation with GNWT-ENR and ECCC.

The GNWT would also like to note as an example that the GNWT does currently mark off a protective buffer zone when an active colony is discovered in an active reject sand pile. This occurred at the KM79 quarry located off Highway 3 and work was shut down because the buffer zone negated working on the other side of the stockpile (as the area was not large enough).

Response to Recommendation 4 (ECCC's recommendation 4.2.2-4)

Construction of the TASR will not include 'inactive areas away from activities'. It is anticipated that only areas required for construction will be accessed.

Response to Recommendation 5 (ECCC's recommendation 4.2.2-5)

The request to compensate the loss of habitat which was created through TASR construction is problematic. Presumably, the party that creates the compensation habitat would then be responsible for designing the habitat, monitoring its use, ensuring the safety of any nests that colonize it, and trying again if it isn't used. It would be preferable for ECCC to provide design criteria for artificial nesting colony habitat, and promote the use of these structures through a Species At Risk Action Plan.

The GNWT would also like to note that habitat compensation hasn't been required for other quarries across the NWT and that standard practice has allowed for work to recommence at sites once nests are inactive. Habitat compensation by definition

should only apply if there is destruction of existing suitable habitat. The GNWT does not support offsets when the environment prior to the establishment of a borrow source was not suitable and colonization only became possible because the landscape was changed as a result of quarrying operations.

2.6 Terrestrial Environment: Avian Species at Risk and Migratory Birds – Mitigation and Monitoring in the Updated Draft Wildlife Management and Monitoring Plan

2.6.1 Recommendations (ECCC’s recommendations 4.2.3-1 to 4.2.3-4)

1. In the event that clearing or disturbance cannot be scheduled outside of the nesting season, ECCC recommends that the Proponent use non-intrusive search methods to conduct an area search for evidence of nesting, prior to the commencement of clearing. Results from all pre-clearing surveys should be reported in the annual wildlife monitoring report.
2. ECCC recommends that the Proponent halt all disruptive activities in an area if migratory bird nests containing eggs or young are discovered. An appropriate buffer zone (i.e., setback distance) should be determined in consultation with ECCC and observed until the young have naturally and permanently left the vicinity of the nest. Buffer zones should be appropriate for the species and take into consideration the intensity of the disturbance and the surrounding habitat. Buffer zones should also be adjusted after assessing their effectiveness.
3. ECCC recommends that the Proponent update the WMMP to clarify that ECCC be included in the reporting of all instances of migratory bird and avian species at risk nesting, incidents and/or mortality and that ECCC be consulted regarding any additional mitigation measures and advice for migratory birds and avian species at risk (ec.eenordrpnntno-eanorthpnrnwt.ec@canada.ca).
4. ECCC recommends that the Proponent incorporate all of the above recommendations into the next revision of the WMMP.

2.6.2 Responses

Response to Recommendation 1 (ECCC’s recommendation 4.2.3-1)

This commitment is included in the WMMP (Section 4.1.1). Note also that the pre-clearing survey for migratory bird nests will not be included in the WMMP, as it will be a one-time occurrence rather than ongoing monitoring. Should the survey be required, ECCC will be consulted regarding methods and reporting. The GNWT is

agreeable to meeting with ECCC in advance of the public hearing to better understand ECCC's non-intrusive search methods.

Response to Recommendation 2 (ECCC's recommendation 4.2.3-2)

This commitment is included in the WMMP (Section 4.1.1). Relevant mitigations in the WMMP include:

- Avoid disturbance or destruction of bird nests and eggs by clearing land outside of the bird nesting and fledging season (May to mid-August); however, if vegetation clearing is required within this time, pre-clearing nest surveys will be completed and no-work zones will be observed for identified active nests. Through consultation with ENR and ECCC, bird nests will be protected by a buffer that protects the nest while allowing construction to continue, and will be monitored weekly. Details of nests identified and the mitigation will be included in the weekly wildlife monitoring reports.
- Birds will be deterred from nesting on infrastructure by placing covers/screens on vents, holes, and crevices where birds could potentially nest, and if necessary through active (but non-lethal) disturbance of birds to discourage them from establishing a nest on a construction site. If bird nesting occurs, the nest will not be disturbed until after the birds have left the area, with clearance to be discussed in consultation with GNWT-ENR and ECCC.

Section 5.1.3 of the WMMP describes weekly surveillance monitoring of project construction camps for signs of wildlife activity including nesting. The next update to the WMMP will clarify that surveillance monitoring will be expanded to include all construction areas including equipment and vehicles that have remained stationary during the spring and may provide nesting sites for birds. Any bird nests discovered as part of routine surveillance monitoring will trigger the same mitigation as bird nests discovered during pre-clearing surveys.

Response to Recommendation 3 (ECCC's recommendation 4.2.3-3)

The WMMP states that ECCC will be contacted regarding environmental issues through weekly and annual reporting (Section 6.1) and on how to respond if a migratory bird nest is found (Section 4.1.1). It is preferable to keep the GNWT Department of Environment and Natural Resources (ENR) as a single contact for all wildlife emergencies, as ENR maintains a 24-hour emergency line. If the issue overlaps with ECCC jurisdiction, the ENR Officer will advise accordingly.

Response to Recommendation 4 (ECCC's recommendation 4.2.3-4)

A revised version of the WMMP will be prepared for the permitting process, and suggestions from ECCC will be considered. ECCC will have the opportunity to comment on the revised WMMP during the permitting process and during a public review of the WMMP, which will be facilitated by the Department of Environment and Natural Resources.

2.7 Terrestrial Environment: Boreal Caribou – Assessment, Mitigation and Monitoring

2.7.1 Recommendations (ECCC's recommendations 4.2.4-1 and 4.2.4-2)

1. ECCC recommends that the Proponent provide precise measurements and associated spatial data of the Project footprint following construction to validate impact predictions and allow the continued assessment of the Boreal Caribou habitat within NT1.
2. ECCC recommends that the Proponent review the mitigation measures suggested for Boreal Caribou for the Canadian Zinc Corporation Prairie Creek All-Season Road and include any applicable mitigation from this project in the next revision of the WMMP.

2.7.2 Responses

Response to Recommendation 1 (ECCC's recommendation 4.2.4-1)

The GNWT commits to providing publicly the precise measurements and associated spatial data of the final Project footprint following construction. This information will be submitted to the Cumulative Impact Monitoring Program Inventory of Landscape Change disturbance database and to the Wek'èezhì Land and Water Board.

Response to Recommendation 2 (ECCC's recommendation 4.2.4-2)

Some of the mitigation measures described during the environmental assessment for the Canadian Zinc Corporation (CZN) Prairie Creek All-Season Road may have limited applicability in some cases due to the Prairie Creek road being situated through an alpine environment near the tree line, in contrast to the boreal forest which is the setting of the TASR. Nevertheless, the mitigation and monitoring in the Prairie Creek Wildlife Management and Monitoring Plan will be reviewed again when drafting the next version of the TASR WMMP. For example, the GNWT

recommended that CZN install windrows consisting of cleared brush at the intersection between existing linear features (mainly seismic lines) and the proposed Prairie Creek road to discourage predator/harvester access along these features and to limit sightlines. The GNWT will consider the feasibility of implementing this measure where the TASR intersects with other existing linear features along the corridor, and where the TASR deviates from the alignment of the old winter road. This will be incorporated in the next version of the WMMP. It should be noted that there are far fewer existing linear features along the TASR compared with the Prairie Creek Road, and the GNWT has also committed to not blocking traditional trails that intersect with the road. The GNWT will have to evaluate whether there are any potential land use conflicts that would limit the implementation of this mitigation measure.

3 REFERENCES

ECCC. 2017. Letter to the Mackenzie Valley Environmental Impact Review Board for EA16/17-01, Tłı̄chǫ All-season Road. Re: Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status for Barren-ground Caribou – Mackenzie Valley Environmental Impact Review Board (MVEIRB) Environmental Assessments. February 15, 2017.

WLWB. 2016. Letter to Dominion Diamonds Ekati Corporation for W2013L2-0002, Request for Information for Mining and Milling Water Licence and Land Use Permit Applications for the Jay Project – Lac du Sauvage, NT. May 20, 2016. <http://registry.mvlwb.ca/Documents/W2013L2-0002/Ekati%20Jay%20Project%20-%20WLWB%20Letter%20to%20DDEC%20-%20Request%20for%20Information%20-%20May%202016.pdf>.

Tłıchǫ All-Season Road

GNWT Technical Report Responses to Natural Resources Canada

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tłıchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokò from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01.

On 11 October 2017, the Natural Resources Canada (NRCan) submitted their technical report to MVEIRB for the TASR Project ([PR#222](#)) outlining recommendations on remaining topics of concern. This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

To facilitate cross-referencing with the PDR and other relevant documents already submitted to the MVEIRB public registry for EA1617-01, this document refers to documents by their public registry number (i.e., the PDR is referred to as [PR#43](#)).

2 RECOMMENDATION AND RESPONSE

2.1 Explosives: Explosives Storage

2.1.1 Recommendation 1 (NRCAN Section 2.1.)

NRCAN is satisfied with the explosives storage information provided. If the project is approved, any applications submitted to NRCAN's Explosives Regulatory Division for the storage of explosives will require more detailed information (i.e., type of magazine, location of explosives storage, and safety and security measures), if the project is approved.

2.1.2 Response 1

The GNWT acknowledges NRCAN's recommendation pertaining to explosives storage and concurs that, at a later date, additional information will be provided to NRCAN in order to satisfy the permit requirements for explosive storage. The preferred proponent (Project Co.) will be responsible for obtaining the necessary permits associated with explosives storage.

2.2 Permafrost: Embankment Design Options

2.2.1 Recommendation 2 (NRCAN Section 2.3.4)

NRCAN recommends that different design options be developed following detailed geotechnical investigations that will consider and accommodate for the range of typical conditions encountered within discontinuous permafrost terrain for the final embankment design of the roadway. NRCAN recommends that permafrost and unstable soils be identified following geotechnical investigations and that highway embankment heights be constructed and with appropriate drainage according to substrate type and drainage requirements to avoid ponding and permafrost thaw. Field investigations should be conducted in support of detailed design, to inform the development of management plans to mitigate impacts on road operation and the surrounding terrain. Additional thermal analyses in select locations may be required to complete the final road design.

2.2.2 Response 2

The preliminary geotechnical information completed by GNWT in 2017 will be supplied to the three short-listed proponents during the Request for Proposal (RFP) stage of the procurement process. The designs that are brought forward by the short-listed proponents will then be evaluated as part of the RFP process so that the best design is obtained. It is expected that the short-listed proponents will follow the geometric design criteria outlined in the Project Agreement with the GNWT. These criteria include but are not limited to: the Government of the Northwest

Territories Design Specifications and Standard Drawings; Transportation Association of Canada (TAC) Geometric Design Guide (2017 release); the Transportation Association of Canada (TAC) Guidelines for Development and Management of Transportation Infrastructure in Permafrost Regions (2010); CSA S6-14 Canadian Highway Bridge Design Code (current edition at Effective date) and, the Alberta Transportation Design Guidelines on Provincial Highways. NRCan's recommendation pertaining to embankment design options will be provided to the short-listed proponents for their information and consideration. The successful proponent (Project Co.) is expected to use best management practices and leading edge technology to design, build, operate and maintain the road for twenty-five years. It will be Project Co.'s responsibility to verify the geotechnical information and determine what additional information will be required for the project to complete design, operation and maintenance, and any monitoring programs.

2.3 Permafrost: Embankment Geotextiles

2.3.1 Recommendation 5 (NRCan Section 2.4.4)

NRCan recommends that geotextiles used beneath the embankment (to provide extra strength and prevent water and subsurface materials penetrating into the embankment) be based upon site conditions as evidenced by geotechnical field investigations.

The specific properties of the geotextile(s) used should be appropriate to the tensile strength, permeability, and weathering resistance requirements encountered. NRCan recognizes that geotextiles may not be required across the entire route, for example where shallow and well-drained bedrock is encountered.

2.3.2 Response 5

The GNWT agrees with NRCan's recommendation pertaining to embankment geotextiles. This consideration is part of the best design practices responsibility of Project Co. and will be considered as part of the process for selection of the preferred proponent. NRCan's recommendation pertaining to embankment geotextiles will be provided to Project Co. for their information and consideration. The GNWT will evaluate the proposed designs of three short-listed proponents during the RFP process which will facilitate selection of the best design. Consideration will be made against a list of standard design criteria outlined in the Project Agreement in addition to best management practices and state of the art technology the proponents may bring forward.

2.4 Permafrost: Pre-existing Permafrost Conditions On and Off Disturbed Terrain

2.4.1 Recommendation 6 (NRCan Section 2.5.4)

NRCan recommends that detailed geotechnical investigations be conducted **for the whole roadway** prior to the final design of the roadway, to characterize permafrost conditions and support quantitative analysis during detailed design, and also to form part of ongoing monitoring and management plans. Monitoring of embankment performance, which should include but not be limited to observations of cracking, sloughing, ponding, aufeis (winter icings) and vegetation changes. Additionally, where permafrost is encountered and where practical, the thermal and hydrologic regime should be monitored to ensure that the embankment performs as predicted.

2.4.2 Response 6

Preliminary geotechnical investigations were conducted at the four proposed bridge crossings, the three proposed major culvert crossings, and along the proposed centerline spaced at a regular interval of approximately 1.5 km in Winter 2017 ([PR#129](#), [#147](#), [#167](#)). These investigations also included the installation of thermistors at the bridge and major culvert crossings. This information will be supplied to Project Co. and it will then be Project Co.'s responsibility to verify the information and determine what additional geotechnical information will be required for the project to complete design, operation and maintenance, and any monitoring programs. NRCan's recommendation pertaining to pre-existing permafrost conditions on and off disturbed terrain will be provided to Project Co. for their information and consideration. The GNWT will evaluate the proposed designs of three short-listed proponents during the RFP process which will facilitate selection of the best design. Consideration will be made against a list of standard design criteria outlined in the Project Agreement in addition to best management practices and state of the art technology the proponents may bring forward.

2.5 Permafrost: Removal of Permafrost

2.5.1 Recommendation 7 (NRCan Section 2.6.4)

NRCan recommends that any attempt to remove isolated patches of permafrost and/or significant ice lenses only be undertaken after appropriate geotechnical and geophysical investigations to confirm the extent of the permafrost and thaw unstable materials.

2.5.2 Response 7

The GNWT agrees with NRCan's recommendation pertaining to removal of permafrost. This consideration is part of the best design practices responsibility of Project Co. NRCan's recommendation pertaining to removal of permafrost will be provided to Project Co. for their information and consideration. The GNWT will evaluate the proposed designs of three short-listed proponents during the RFP process which will facilitate selection of the best design. Consideration will be made against a list of standard design criteria outlined in the Project Agreement in addition to best management practices and state of the art technology the proponents may bring forward.

2.6 Permafrost: Geotechnical Conditions

2.6.1 Recommendation 8 (NRCan Section 2.7.4)

NRCan recommends that, in addition to geotechnical studies conducted to date (Draft Road Alignment Geotechnical Report 2017-08-09) that further site investigations be carried out to confirm permafrost and subsurface conditions, in particular near water crossings, on slopes and where major structures will be built, in order to support final design and also to inform development of any mitigation, management and monitoring plans. NRCan also recommends that deeper geotechnical boreholes, installation of temperature cables and geophysical surveys would be useful components of the detailed site investigations to characterize permafrost conditions and also support quantitative analysis during detailed design and to form part of the management and potential monitoring plans.

2.6.2 Response 8

Preliminary geotechnical investigations were conducted at the four proposed bridge crossings and the three proposed major culvert crossings in Winter 2017 ([PR#129](#), [#147](#)). These investigations also included the installation of thermistors at the bridge and major culvert crossings. This information will be supplied to Project Co. and it will then be Project Co.'s responsibility to verify the information and determine what additional geotechnical information will be required for the project to complete design, operation and maintenance, and any monitoring programs. NRCan's recommendation pertaining to geotechnical conditions will be provided to Project Co. for their information and consideration. The GNWT will evaluate the proposed designs of three short-listed proponents during the RFP process which will facilitate selection of the best design. Consideration will be made against a list of standard design criteria outlined in the Project Agreement in addition to best management practices and state of the art technology the proponents may bring forward.

2.7 Permafrost: Borrow Materials

2.7.1 Recommendation 9 (NRCan Section 2.8.4)

NRCan recommends that the Developer provide a complete assessment of the actual quality and quantity of granular and quarry materials available at each final identified source and whether these sources are suitable from a geochemical perspective. In particular, NRCan recommends that identification of material availability of suitable bedrock, quality granular materials, general fills and concrete aggregates be completed.

2.7.2 Response 9

The GNWT has conducted a review of the draft geotechnical report for borrow sources (PR#200, #201, #202, #203, #204, #205, #206, #207, #208) and expects the report to be 'Issued for Use' in November; only minor changes are expected. This report summarizes the quality and quantity of granular materials available at each borrow source that was investigated in Summer 2017 and confirms that the sources are suitable from a geochemical perspective. This preliminary geotechnical information will be supplied to Project Co. and it will then be Project Co.'s responsibility to verify the information and determine what additional geotechnical information will be required for the project. NRCan's recommendation pertaining to borrow materials will be provided to Project Co. for their information and consideration.

3 REFERENCES

Alberta Transportation, 1999. Highway Geometric Design Guide. Alberta Transportation. Edmonton, Alberta.

Canadian Standard Association, 2014. CAN/CSA S6-14, Canadian Highway Bridge Design Code. Canadian Standards Association. Toronto, Canada.

Department of Transportation (DOT), 1996. Standard Specification and Drawings for Highway Construction. GNWT. Edition 6. Yellowknife, NT. (internal document)

Transportation Association of Canada (TAC), 2010. Guidelines for Development and Management of Transportation Infrastructure in Permafrost Regions. TAC. Ottawa, Canada.

Transportation Association of Canada (TAC), 2017. Geometric Design Guide of Canadian Roads. TAC. Ottawa, Canada.

Tłıchọ All-Season Road

GNWT Technical Report Responses to the North Slave Métis Alliance

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tłchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokò from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01.

On 11 October 2017, the North Slave Métis Alliance (NSMA) submitted their technical report to MVEIRB for the TASR Project ([PR#214](#)) outlining recommendations on remaining topics of concern. This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

To facilitate cross-referencing with the PDR and other relevant documents already submitted to the MVEIRB public registry for EA1617-01, this document refers to documents by their public registry number (i.e., the PDR is referred to as [PR#43](#)).

2 RECOMMENDATION AND RESPONSE

2.1 NSMA Members' Traditional Knowledge

2.1.1 Recommendation (NSMA recommendation, unnumbered)

The Developer should, once completed, accept the NSMA TK Study, and consider it in future regulatory discussions and decisions (e.g. WMMP and LUP).

2.1.2 Response

The GNWT acknowledges the NSMA's recommendation pertaining to the NSMA members' traditional knowledge (TK). The GNWT has made a continued effort to engage with indigenous groups through this environmental assessment as has been documented in the engagement log and engagement log updates ([PR#43](#), [PR#110](#)). As per the conditions of the contribution agreement between the GNWT and the NSMA, funds were "granted under the stipulation that the NSMA should adhere to the Review Board's timelines and should not create any unnecessary delays with the EA process" ([PR#116](#)). Once the NSMA's TK study has been completed, the GNWT agrees to review the report and consider it in future regulatory discussions related to the TASR.

2.2 Continued Consultation with NSMA

2.2.1 Recommendation (NSMA recommendation 1)

NSMA should be included in the ongoing monitoring and management of wildlife in the project area.

2.2.2 Response

The GNWT envisions several ways for NSMA to be included in the ongoing monitoring and management of wildlife in the project area. NSMA, along with other parties to the environmental assessment, will be provided with another opportunity to review and comment on the Wildlife Management and Monitoring Plan (WMMP) during the regulatory phase for the TASR project. NSMA will also have the opportunity to review and comment on annual and comprehensive WMMP reports. The GNWT does invite NSMA members to participate in wildlife surveys as opportunities are available, and the GNWT can continue to do so for surveys of the TASR study area. The GNWT welcomes discussion of how NSMA might participate in the traditional knowledge (TK) based monitoring program proposed for TASR study area which we expect will be coordinated through the Tł̨chq̨ Government.

2.2.3 Recommendation (NSMA recommendation 2)

NSMA should be included as a co-management partner who receives boreal caribou collar monitoring result and data.

2.2.4 Response

Anyone interested in obtaining boreal collar data for an approved purpose (such as to support research and conservation actions) can submit a request for a data sharing agreement to the GNWT. Monitoring results will be provided in annual WMMP reports which will be made publicly available, and thus shared with NSMA and all other parties to the EA.

2.2.5 Recommendation (NSMA recommendation 3)

NSMA should be included in the list of relevant Aboriginal government organizations (WMMP p.49).

2.2.6 Response

The GNWT will include NSMA, and any other potentially affected Aboriginal government or organization, in any discussions relating to concerns about unsustainable levels of wildlife harvest in the TASR project area. The GNWT will update the WMMP to include a more detailed list of Aboriginal government organizations that would be contacted in the event that such discussions need to take place.

NSMA is already a participating member of the Wildlife Act Working Group, and the GNWT engages with NSMA through that forum on the development of regulations under the *Wildlife Act* pertaining to wildlife harvesting.

The GNWT also holds annual “Section 15” meetings, as required under the *Wildlife Act*, with the purpose of promoting cooperative and collaborative working relationships for effective wildlife management at the local, regional and territorial levels. This would also be a potential forum to raise concerns related to wildlife harvest along the TASR.

2.3 Direct and Indirect Effects on Boreal Caribou

2.3.1 Recommendation (NSMA recommendations in section 3.2 of Appendix A of their intervention)

The Access and Harvest Monitoring methodology proposed in the draft WEMP is generally supported by the NSMA. The amount of patrolling, which is not stated within the WEMP, will be vital to the success of this plan. We request the following to ensure that the plan is as effective:

1. Rather than move the harvest check station, which may render a “blind spot” for harvest north of Whatì (potentially moreso for barren-ground caribou herds), add a second check station.
2. We recommend working with interested and knowledgeable stakeholders to help further guide effective monitoring and patrolling methods for access and harvest along the TASR. Incredible care will be needed to ensure that access and harvesting do not significantly impact boreal caribou in the NWT.

2.3.2 Response

1. The GNWT believes that one check station relocated to the TASR south of Whatì will be sufficient to capture most of the traffic coming into the region from the south to harvest wildlife in areas north of Whatì. ENR is also proposing to create a new Renewable Resource Officer position in Whatì, who could initiate a temporary check station at the existing site if there are reports of activity in that area. It is important to note that it is not mandatory for people to stop and report at check stations; however, the Renewable Resource Officer can enforce someone to pullover.
2. The GNWT will seek NSMA’s further input on ENR’s proposed methods for monitoring access and harvest along the TASR as part of the review of an updated WMMP during the regulatory phase for the project.

2.4 Apparent Competition between Caribou and Other Ungulates

2.4.1 Recommendation (NSMA recommendation in section 3.4.1 of Appendix A of their intervention)

Revise the spatial scale of the regional study area to a smaller and more relevant area for boreal caribou, rather than examining potential effects relative to the entire NT1 range. One suggested unit for consideration is the watershed scale.

2.4.2 Response

The ASR (PR#110) and the GNWT response to WRRB IR#8 ([PR#134](#)) and 9 ([PR#142](#)) include analysis of the amount of undisturbed habitat in both the NT1 range and within the Wek’èezhì portion of the NT1 range. As stated in the GNWT response to WRRB IR#9, the Wek’èezhì portion of the NT1 range likely does not contain a biologically discrete caribou population, and likely neither would the group of watersheds affected by the Project. The GNWT will consider alternative proposals to the boreal caribou study area during the WMMP approval phase, but ultimately the study area will be informed by the area used by the caribou wearing currently deployed GPS collars (see GNWT response to ECCC IR#7, [PR#128](#)).

2.4.3 Recommendation (NSMA recommendation in section 3.4.2 of Appendix A of their intervention)

Provide a more fulsome consideration of the baseline resiliency of local boreal caribou populations, and their current and future apparent competition with moose and other prey (wood bison), in an update to the effects assessment. Using updated baseline information, and considering information presented in Section 3.0, make new inferences about the magnitude of changes in predator-prey relationships due to direct or indirect effects of the road on apparent competition.

2.4.4 Response

The issue of baseline resiliency of boreal caribou and apparent competition with moose and other prey was considered in the ASR and more fulsome consideration was provided in the GNWT response to WRRB IR#11 ([PR#142](#)).

The weight of available evidence, including the evidence provided by the NSMA, indicates that incremental and cumulative changes from the Project and other developments should not have significant adverse effects on the self-sustaining and ecologically effective boreal caribou population in the NT1 range. Although apparent competition is an important mechanism driving population decline, and the NSMA have identified uncertainty about whether or not this mechanism is important in the NWT, there is little evidence to support the potential for the TASR to contribute in significant ways to either the functional response (i.e., increasing the rate at which wolves kill caribou) or numerical response (i.e., increasing wolf density) components of apparent competition. The potential for the TASR to contribute to either functional or numerical responses is limited because the TASR will follow an existing linear disturbance.

The uncertainty identified by NSMA about moose and wolf densities required to cause caribou population declines is justified because, as the NSMA point out, limited information is available in the literature about apparent competition in the NWT. However, it is also important to recognize that the NSMA have not provided any scientific literature to refute Bergerud and Elliot's (1986) conclusion that wolf densities higher than 6.5 wolves/1000 km² are needed to destabilize caribou populations. In fact, the opposite is true.

The preliminary meta-analysis undertaken by Serrouya et al. (2016), which included data from the NWT, generally supports the findings of Bergerud and Elliot (1986). Although more data is needed to make definitive conclusions, Serrouya et al. (2016) found that higher wolf densities are correlated with lower caribou population growth rates, and their initial analyses indicate that wolf densities as high as 8/1000 km² may be required to cause declines in caribou populations across

a range of caribou densities (see figure 5 in Serrouya et al. 2016). Similarly, Latham et al. 2011 note that rapid decline in caribou in northern Alberta occurred after wolf density increased from 6 wolves/1000km² in the 1970s to over 11 wolves/1000 km² in the 2000s.

After considering the evidence provided by the NSMA, the magnitude of change in predator-prey relationships due to direct or indirect effects of the TASR are not predicted to be different from the predictions made in the ASR. The presence of some uncertainty in these conclusions is recognized, and the conclusions will be confirmed through the boreal caribou monitoring described in the WMMP.

2.4.5 Recommendation (NSMA recommendation in section 3.4.3 of Appendix A of their intervention)

Due to uncertainty, collect ongoing data on boreal caribou in the regional study area and Project Area, to improve knowledge of population size, distribution, and trends. Include monitoring for the project's effect on other prey species that could interact via apparent competition (e.g., wood bison), and wolf densities in relation to caribou survival and reproduction. We note that the updated V.2 of the WMMP (September 2017) already includes helicopter-based monitoring for moose populations. The balance of such numbers may be crucial in determining adaptive management programs to aid in boreal caribou recovery and to prevent declines.

2.4.6 Response

The GNWT agrees that expanded monitoring of boreal caribou, moose and bison is justified, and the proposed monitoring for these species is described in the WMMP. At this time, the resources required to additionally monitor wolf densities are not justified. If the monitoring indicates a concern with the status of boreal caribou, moose or bison, then the monitoring of wolves may be initiated as a management response.

2.4.7 Recommendation (NSMA recommendation in section 3.4.4 of Appendix A of their intervention)

Include adaptive management and mitigation measures in the WMMP, should monitoring results indicate negative effects on the boreal caribou population.

2.4.8 Response

The WMMP outlines both the proposed mitigation measures and the approach to adaptive management. See also the response to MVEIRB IR#21 ([PR#146](#)), which outlines other mitigation proposed to reduce environmental impacts. The Tłı̨chǫ Government will assist in providing traditional knowledge to guide WMMP adaptive

management ([PR#216](#)). Should the monitoring results indicate negative effects on the boreal caribou population, the GNWT will work within the co-management framework to explore and address concerns, and options for adaptive management.

2.5 Road Effects on Predator Deterrence

2.5.1 Recommendation (NSMA recommendations in section 4.2.1 to 4.2.4 of Appendix A of their intervention)

Based on our review, we recommend that additional attention be paid to this issue and that further information be presented in the DASR (results, residual effects, mitigation). More specifically, we would like to see the following additions made to the effects assessment within the DASR:

1. Provided a careful weighing of this information within the DASR, along with a strong illustration of the uncertainty associated with this predation pathway (alongside apparent competition, discussed in Section 3.3).
2. It should also be possible to estimate the extent of the effect given information presented in, for example, Leblond et al., 2013.
3. As noted in Section 3.0, reduce the regional study area for boreal caribou to arrive at more realistic regional impact predictions.
4. As needed, present additional monitoring and adaptive management triggers that could be introduced in response to the interaction with the road as a travel corridor for wolves and black bears, and predation related mortality increases to boreal caribou, barren-ground caribou, or wood bison.

2.5.2 Response

Response to Recommendation #1

The literature review provided in the NSMA Technical Report provides relevant information about the potential effects of linear disturbance on caribou predator-prey systems. These potential effects have been acknowledged in the ASR. Importantly, and missing from the NSMA Technical Report, any conclusion regarding changes in predation relative to the road must consider that the TASR will follow an existing trail, known locally as the Old Airport Road. This is an important design feature of the TASR, and this route was selected primarily because it reduced the need for creating new linear disturbance on the landscape (see Section 4 the PDR, [PR#43](#)). As concluded in the ASR, the Old Airport Road is likely already in use by wolves and this fact is part of the baseline conditions, not a Project-induced effect.

The literature review provided cites several studies that found that use of roads by wolves improves hunting efficiency, particularly in winter when roads facilitate travel relative to deep snow in the surrounding forest. The Old Airport Road is currently used in winter for snowmachine travel, dog mushing, hunting and harvesting of firewood, and therefore the improved hunting efficiency for wolves is already present under existing conditions. Finally, the literature review indicates that predation rates can be affected by road density, though roads and other developments may need to be extensive before an effect is identified (Leblond et al. 2013). Because the TASR follows the existing Old Airport Road, the regional increase in road density will be marginal, even when reasonably foreseeable future projects are considered (see response to ECCC IR#6, [PR#140](#) for fragmentation estimates in the NT1 range).

The literature review provided in the NSMA Technical Report was insightful, and the literature cited continues to support the weight of evidence indicating that potential for the TASR to result in increased use or higher hunting efficiency by predators will be small relative to existing conditions.

Some uncertainty is present with regard to the effect of the TASR on caribou predator-prey dynamics. This uncertainty was addressed in the ASR by overestimating potential effects on boreal caribou (i.e., identifying a possible measurable increase in predation). Uncertainty will be further addressed using the monitoring described in the WMMP, which will provide information about caribou survival.

Response to Recommendation #2

The ultimate purpose of an environmental assessment is to determine whether the development is likely to have significant adverse environmental impacts (MVEIRB 2004). The weight of evidence indicates that the changes in predator-prey dynamics caused by the TASR are not likely to lead to significant or even measureable changes. This conclusion considers the large home range and high mobility of both wolves and caribou, the low existing density of linear disturbances and the presence of an existing linear disturbance in the place where the TASR would be constructed.

Response to Recommendation #3

The GNWT will consider alternative proposals to the boreal caribou study area during the WMMP approval phase, but ultimately the study area will be informed by ecologically relevant population unit boundaries and the area used and movement patterns of caribou on which GPS collars have been deployed in the vicinity of the

TASR (see GNWT response to ECCC IR#7 [[PR#128](#)] for details on recent GPS collar deployments).

Response to Recommendation #4

Monitoring of predators or predation rates would require a significant investment of resources, which are not considered justified at this time. If the proposed caribou, moose and bison monitoring indicates population level concern related to wolf predation, the GNWT will work within the co-management framework to explore and address concerns.

2.6 Habitat Loss

2.6.1 Recommendation (NSMA recommendation in section 4.4 of Appendix A of their intervention)

We recommend that the GNWT re-calculate and re-assess the amount of continuous boreal caribou habitat within the NT1 range, prior to TASR construction. Further, we recommend that mitigation or habitat compensation measures be clearly articulated, if the updated “base case” of undisturbed habitat is found to be below the 65% threshold required for a self-sustaining boreal caribou population (or slightly above it, whereby the project could drop it below the threshold). In such a scenario, the GNWT should commit to compensating for habitat loss due to the Project. If the regional study area is modified to a smaller area, as per the NSMA’s suggestion (Section 3.3), the same exercise should be done within the reduced regional study area.

The NSMA also requested that the GNWT consider habitat compensation in the Wek’èezhìi portion of the NT1 range to offset Project impacts (Topic 34, q.1), as the amount of undisturbed habitat in this region is estimated at 55% (CMA, 2017), well below the 65% threshold. The answer provided by the GNWT indicates that they would consider feasible options, depending on the Tłı̄ch̄q Government. We recommend that the GNWT continue discussions with the Tłı̄ch̄q Government, NSMA, interested stakeholders, managers, and communities to develop a suitable habitat compensation plan, which ideally restores functional habitat along of existing linear corridors to offset habitat loss and predation impacts of the proposed road project for boreal caribou.

2.6.2 Response

The GNWT is willing to consider re-calculating and re-assessing the amount of continuous boreal caribou habitat within the NT1 range, prior to TASR construction.

The GNWT commits to the mitigation hierarchy described in the ASR Section 2.31 as it relates to managing the impacts of this project on wildlife and their habitat, understanding that the hierarchy of mitigation involves, in order of priority: avoidance, minimization, restoration, and finally, offsetting (BBOP 2017). The design of the TASR prioritized avoiding impacts altogether by primarily utilizing an existing corridor along the old Airport Road alignment to avoid creating substantial new disturbance, but it is recognized that there will be additional disturbance beyond the existing footprint. The project then minimizes impacts through actions outlined in the WMMP. With respect to restoration, the GNWT will follow the reclamation guidelines in the Northern Land Use Guidelines for quarries and borrow sources, which were developed with a view to increasing the probability of re-vegetation in these areas.

It is important to realize that offsetting, as the last step in the mitigation hierarchy, is meant to address residual losses – those measurable ecological losses remaining after all reasonable steps have been taken to avoid and minimize losses from a proposed development. Not all losses are measurable or “offsettable.” The GNWT is in the process of studying the utility, effectiveness, and legal implications of potential offsetting approaches in the context of regulatory decision making and range planning for boreal caribou and barren-ground caribou, including when and where it is appropriate and how it might be undertaken by developers. The GNWT is undertaking this work with a view to developing a policy and guidelines around the use of offsets for mitigating residual impacts from developments. Until this work is completed, the GNWT cannot commit to the implementation of specific offsets for the TASR project. This work may identify viable offsetting projects that can be undertaken by developers, when and where they are appropriate. The GNWT will need to identify appropriate funding and implementation mechanisms for this work.

2.7 Wildlife Group Sizes for Informing Mitigation

2.7.1 Recommendation (NSMA recommendation in section 5.2.1 of Appendix A of their intervention)

We request that the GNWT do the following for the next iteration of the WMMP:

1. Consider group size information and seasonal changes in group sizes presented herein in the next iteration of the WMMP. For instance, we show in Section 6.0 that the use of collar information to trigger mitigation is not very useful during seasons where boreal caribou are more solitary (such as during calving), but may be more useful during times of year when they are found in larger groups. Having a strong prediction of seasonal clustering patterns is critical for

designating effort towards selecting appropriate seasonal monitoring and mitigation plans that protect the most animals.

2.7.2 Response

The concept of mitigation responses to group size was not included in the WMMP for the reason outlined in the literature review provided: group sizes vary widely throughout the year. Further to this, the thick forest surrounding the TASR can make it difficult to determine the group size. Rather, the focus of the WMMP mitigation has moved to triggering mitigation for all and any observations of large mammals, regardless of the group size (such as communicating the presence of wildlife on roads to other drivers, and providing the right-of-way to wildlife on roads and all other active construction areas). In some cases, the WMMP proposes scaled mitigation relative to sensitive seasons (see WMMP Appendix E ([PR#192](#))). Section 4.3.1 of the WMMP also indicates that if bison are present on roads, the Environmental monitor will be contacted. Environmental monitors will be aware that groups of bison with more than 5 individuals are likely to be nursery groups containing calves and juveniles. The environmental monitor will also be able to manage issues as they arise in consultation with the Project Supervisor and appropriate agencies, when required. During the GNWT's Deh Cho Bridge project, there were instances when bison were within the immediate construction zone; crews then had to wait up to 15 min for the bison to move on. It is expected, under the guidance of the environmental monitor, a similar practice would be likely.

While it is correct that the boreal caribou collar information may not be as useful an indicator of caribou location during seasons when they are solitary, this will be balanced by the WMMP mitigation triggered by the presence of a single animal. With wide-ranging and mobile species such as caribou, it should be assumed that there will be some individuals near the TASR throughout the year, and mitigation should be designed with this in mind.

2.8 Mitigation in Sensitive Seasons (General)

We request the following be modified within the next version of the WMMP:

2.8.1 Recommendation (NSMA recommendation in section 6.1.1 of Appendix A of their intervention)

Alter sensitive periods for boreal caribou to include post-calving and rut periods

2.8.2 Response

The sensitive period for boreal caribou labeled as "calving" in the WMMP is from 05 April to 06 June, and includes the post-calving period as identified in the seasonal

activity periods reported in Table 6 of the NWT Species Status Report for Boreal Caribou (Species at Risk Committee 2012). GNWT recognizes that the post-calving period may extend beyond June 06, and vary year to year. Calves are particularly vulnerable to mortality during the first 50 days following birth (Pinard et al. 2012), so if 50 days were added onto the end of the “peak calving” period (7-21 May) as defined in Table 6 (Species at Risk Committee 2012), the post-calving period should extend to July 10. For simplicity, and to be consistent with the calving periods reported in the WMMP for moose and bison, this period could be extended to July 15. GNWT will update the sensitive period for boreal caribou calving to include the post-calving period. The new sensitive period for boreal caribou calving will be April 05 – July 15.

GNWT does not agree that the rut (breeding) period needs to be included as a specific sensitive season for boreal caribou, as they are exhibiting longer daily movements at this time of year (4.6 km/day) and would be able to avoid or move away from areas of sensory disturbance from construction without the higher energetic demands one might expect during late winter, and there is not the same risk of calf mortality as a result of sensory disturbance at this time of year.

Appendix E of the WMMP already includes visual scans 500 m ahead of clearing operations to determine presence of boreal caribou during the rutting period, and operations will be temporarily suspended if boreal caribou are detected in this cautionary zone. Visual scans will also be conducted in advance of blasting to determine presence of boreal caribou.

2.8.3 Recommendation (NSMA recommendation in section 6.1.2 of Appendix A of their intervention)

Wherever possible, avoid construction during sensitive seasons for boreal caribou and wood bison.

2.8.4 Response

The GNWT does not believe this is a necessary or feasible mitigation measure. With NSMA's suggested addition of the post-calving and rut seasons as sensitive seasons for boreal caribou, and longer sensitive periods recommended for bison, the window of opportunity to undertake construction activities would essentially be limited to about four months out of the year.

The WMMP includes many proposed mitigation measures to reduce sensory disturbance to boreal caribou and bison during sensitive periods and throughout the rest of the year. These include temporary suspension of activities when caribou

or bison are in proximity to construction activity, and reductions in speed limits to reduce the risk of collisions with vehicles.

2.8.5 Recommendation (NSMA recommendation in section 6.1.3 of Appendix A of their intervention)

Along with the use of collar data, include ground-based wildlife surveys (in Appendix E) prior to vegetation clearing, blasting, and other construction activities during the calving and post-calving periods, and rutting season in the next WMMP. Ground-based surveys should enable visibility to at least the distance of the exclusion area around the planned activity.

2.8.6 Response

Appendix E of the WMMP already includes ground-based surveys for boreal caribou within 500 m of vegetation clearing and blasting activities during the late-winter period as outlined in Table 1. The GNWT specifically chose not to include ground-based surveys for boreal caribou during the calving period because it was felt that the presence of people on foot actively searching for caribou could be more disruptive to calving females than the noise from blasting itself. As mentioned by NSMA in section 7 (pg. 27) in their technical report, wildlife may perceive humans on foot as a greater threat than they do vehicles (e.g. McLeod et al.). In winter 2018, the GNWT will attempt to deploy more collars on female boreal caribou in the vicinity of the TASR alignment (subject to approval of a wildlife research permit), so there should be information on a greater proportion of females in the area during the calving season. Appendix E already outlines a very cautious approach for the calving season in that vegetation clearing or blasting would be suspended if collar data indicates that boreal caribou are within 3 km. Collar data would be re-evaluated every 24 hours to determine if they move out of this cautionary zone, at which point activities could resume.

2.8.7 Recommendation (NSMA recommendation in section 6.1.4 of Appendix A of their intervention)

While both collar and ground-based monitoring should be used during sensitive seasons, we suggest that the GNWT rely more heavily on collar data during the late winter and rut seasons, as collar locations will likely represent the largest and second largest groups of boreal caribou during this season (i.e., one collar will demarcate a cluster of individuals; Section 5.0). Inversely, we highly recommend relying more heavily on ground-based monitoring, supplemented with collar data, during the calving, post-calving, and other periods when boreal caribou are far more solitary (and when collars will usually only represent collared individuals or pairs).

2.8.8 Response

Please refer to the response in Section 2.8.5. As per Appendix E of the WMMP, ground-based surveys are proposed during late-winter and calving periods for vegetation clearing and blasting, and for vegetation clearing these ground-based surveys will also take place 500 m ahead of clearing during the remainder of the year. For blasting, during other periods of the year, all blasts will be preceded by a visual scan of the danger zone and an air horn blast. As boreal caribou are more mobile during these times of the year it is expected that the air horn blast will deter them from the area, and the visual scan will ensure that no caribou are at danger of physical harm.

2.8.9 Recommendation (NSMA recommendation in section 6.1.5 of Appendix A of their intervention)

During sensitive seasons for boreal caribou and wood bison, when safety allows, alter the flight mitigation to include stricter mitigation of aircraft use during sensitive seasons. We recommend that flight altitudes be at least 300 m (1,000 ft) above ground level (AGL) during less sensitive periods. During sensitive times of the year for ungulate SAR (boreal caribou and bison), however, we support the maintenance of over-flight altitudes of at least 600 m (2,000 ft) AGL. These mitigation recommendations for sensitive seasons are taken from “Flying in Caribou Country”, which was produced by the Government of Yukon for protection of barren-ground and boreal caribou in the Yukon (EDI, 2010) after extensive research.

2.8.10 Response

The WMMP already requires that the GNWT “Flying Low?...Think Again!” guidelines be followed, which recommend 1000 ft as a minimum flight altitude. See section 4.3.1 (pg. 23) of the WMMP and Appendix F. The GNWT notes that the Yukon guidelines referred to in the recommendation were developed for the mountain ecotype of woodland caribou, not the boreal the ecotype of woodland caribou as stated by NSMA.

2.8.11 Recommendation (NSMA recommendation in section 6.1.6 of Appendix A of their intervention)

Include a table (similar to Table 1, Appendix E) summarizing mitigation and monitoring for wood bison during the sensitive calving season.

2.8.12 Response

A table summarizing specific mitigation and monitoring for bison and moose during sensitive periods will be considered to the next version of the WMMP.

2.8.13 Recommendation (NSMA recommendation in section 6.1.7 of Appendix A of their intervention)

Please provide references for and explain why the AANDC et al. (2012) guidelines were not followed for wood bison sensitive seasons (which state that a setback of 0.5 km should be used between 1 March to 16 July)? Please correct in next iteration to match sensitive season to guidelines if there is no biological reason for the GNWT to have shortened this period by 1.5 months.

2.8.14 Response

The calving period defined for bison (April 15 to July 15) in the document entitled “Peace region least-risk timing windows: Biological rationale” (Government of British Columbia, 2009) was used in the WMMP, as no dates for the calving period are reported in the status and assessment report for wood bison in the NWT (Species at Risk Committee 2016) or the draft Mackenzie bison management plan (Mackenzie Bison Working Group 2016). The March 01-July sensitive period reported in AANDC et al. (2012) was likely intended to include the late-winter period when deep snow can restrict or increase the energetic demands of movement. The GNWT will change the sensitive period for bison to Mar. 01 – July 15 in the next version of the WMMP.

2.9 Ungulate and Bovid Responses to Disturbances and Mitigation

2.9.1 Recommendation (NSMA recommendations in section 7.1 of Appendix A of their intervention)

Based on this review, and in the absence of information on the specific effects of blasting and construction activities on the physiological and behavioural responses of boreal caribou or bison, we recommend the following:

1. Set a preliminary blast sound effect threshold at 90 decibels. A distance threshold may then be devised based on noise modelling or testing of blast noises received at different distances. We expect the distance effect threshold to be in the range of 250 – 756 m based on literature. If the current blast distance of 500 m does not exceed 90 decibels, then 500 m, as suggested in the WMMP (V.2), is acceptable.
2. Adaptive management to enable the immediate adjustment of buffer distances between wildlife and construction activities, based on behavioural observations of ungulates and bovinds, is recommended.

2.9.2 Response

Response to Recommendation #1

As described in the WMMP, any blasting, if required, would be preceded by continual sound from drilling, and an air horn prior to the blast. Thus, any wildlife in the area will be aware of the activity prior to the blast and will likely avoid the area. As outlined in Appendix E of the WMMP, ground-based surveys will be undertaken within 500 m of the blast site prior to blasting to determine the presence of boreal caribou during the late winter and calving seasons. These surveys would also detect the presence of bison and moose if they were in the area. The focus of the mitigation proposed in the WMMP is to manage the risk of injury to wildlife from blasting in the rare event that wildlife might be in the vicinity of the blast zone and to manage sensory disturbance to boreal caribou within 500 m of the blast site during sensitive seasons. Construction and operation of the TASR are anticipated to cause sensory disturbance to wildlife, as discussed in the ASR.

Response to Recommendation #2

The WMMP includes a protocol for monitoring the presence of wildlife within the blast radius, and for ground-based surveys within 500 m of the blast site during sensitive periods (Appendix E). If wildlife are present within the blast radius, the WMMP suggests that they be deterred to mitigate the risk of injury. While the WMMP proposes documenting the response of wildlife to the deterrent efforts, and wildlife behaviour will be documented opportunistically in other instances (such as during the Wildlife Road Survey), the suggested behavioural monitoring specific to blasting is unnecessary and not likely to provide useful information. As described above, any blasting would be preceded by a long duration of other noise and activity in the area, which would also likely deter wildlife before they approach the blast area.

2.10 Snow Clearing and Escape Gaps

2.10.1 Recommendation (NSMA recommendations in section 8.1 of Appendix A of their intervention)

As the GNWT has not yet provided a firm commitment to including necessary information for, or dealing with this issue via mitigation, we would like the GNWT to ensure that appropriate snowbank mitigation is included within the next WMMP (V.3). We request the following be added back in, and enhanced, as mitigation:

1. Creating escape gaps every 200 m near high quality habitat and 300 m around lower quality habitat (V.1 of the WMMP stated gaps would be created every 300 m). The GNWT can later modify gap frequency in problem areas.
2. Ensure that snow within escape gaps are maintained at generally less than 55 cm.

2.10.2 Response

Response to Recommendation #1

All-season road embankments are typically higher than the surrounding area. All-season roads are cleared in winter through a two-step process. First, a truck equipped with snow plows and typically gravel spreaders make a pass to remove snow from the road. Second, a grader makes a second pass to slope the snow on the side of the berm. This second step is intended to reduce the formation of snow berms on the side of the road (which lead to drifting), and to help insulate the ground adjacent to and beneath the road (to maintain permafrost). The flattening/removal of snow berms along the road side from this second step should help to facilitate movement of wildlife off of the road if there is an approaching vehicle. This is different from winter roads that may have steep snow berms that may act to “trap” wildlife on the road. Creating escape routes off the all-season road would require a third pass by a third piece of equipment, capable of moving through deep snow. This would be an extremely slow and expensive task, particularly considering that the escape route would then be covered and graded again at the next pass of the first two pieces of snow clearing equipment. Instances of wildlife becoming stuck in snow alongside all-season roads have not been observed by the GNWT-INF Highway Operations. The GNWT will ensure that, as part of the development of a wildlife collision and sightings smartphone app for use by INF, ENR and Project Co. employees that will regularly travel the TASR once operational, it includes a mechanism for reporting instances of wildlife that show signs of being stuck or having difficulty moving through snow cleared alongside of the road.

While there is general agreement with and among the literature provided by in the NSMA Technical Report that wildlife avoid deep snow, it should be remembered that deep snow is a natural feature of the landscape in winter. Further, any ‘escape’ routes cleared for wildlife may just as easily be used by wildlife to access the road as to leave it.

Ultimately, the TASR will be operated like any other NWT highway, with a range of ongoing mitigation, signage and public education to reduce wildlife collisions (as outlined in Section 2.5 of the WMMP).

Response to Recommendation #2

The threshold of 55 cm is derived from a study of caribou crossing a road situated on the barren lands, which offers a very different situation from the TASR, and is not relevant to the TASR. All NWT highways are managed to remove all snow berms and to provide a negative slope on either side of the road, to reduce snow drifting on the road. Snow on the barren lands tends to be hard packed through wind action and caribou can typically travel through and often above the snow with little difficulty. This is in contrast to the boreal forest in the region of the TASR, where winter snow pack can reach 1.5 m of loose powder snow by late winter.

2.11 Bison Protection for Large Groups

2.11.1 Recommendation (NSMA recommendation in section 9.1 of Appendix A of their intervention)

NSMA recommend the following:

1. That the GNWT revisit their mitigation for large groups of bison, but use more protective trigger numbers for large groups, informed by scientific literature (See Section 5.1.3). While, it will ultimately be the Environmental Monitors to make the call, including a provision for enhanced measures for large groups can be used to guide monitors.
2. Clarify work stoppage distances for bison or groups of bison (rather than just distances to invoke lower speed limits), as was present in V.1 of the WMMP.

2.11.2 Response

Further review of GNWT experience with other highway construction projects revealed that, as described in the WMMP (Section 2.5), bison are regularly present around construction and operation sites of Highway 3 (see photo 1). During construction of the Deh Cho Bridge, bison were regularly present in laydown areas, likely selected for insect avoidance, and were seemingly untroubled by the construction activity surrounding them. Rather than immediately implementing deterrent measures should bison enter work areas, which may cause them undue stress, the WMMP proposes to allow bison to go where they may. If bison enter a work area, environmental monitors will be notified and asked to assess the situation. As outlined in Section 4.3.1 and 4.4.1 of the WMMP, wildlife will always have the right of way on all roads during construction, and work stoppages will be implemented where there is a potential risk of injury to bison and safety of workers. If deterrent measures are required to reduce these risks, the WMMP identifies that environmental monitors should use extra caution when there are groups of 5 or more bison because they are more likely to contain calves and juveniles. As outlined

in Section 6.2.1 of the WMMP, the adaptive management process describes that any incident involving injury or mortality of bison as a result of construction operations will require an incident report and will trigger an immediate review of the WMMP mitigation. This provides a mechanism by which this mitigation can be tested and improved once construction begins. The Tłı̨chų Government will assist in providing traditional knowledge to guide WMMP adaptive management (See Post Technical Session Commitment 4; [PR#216](#)).

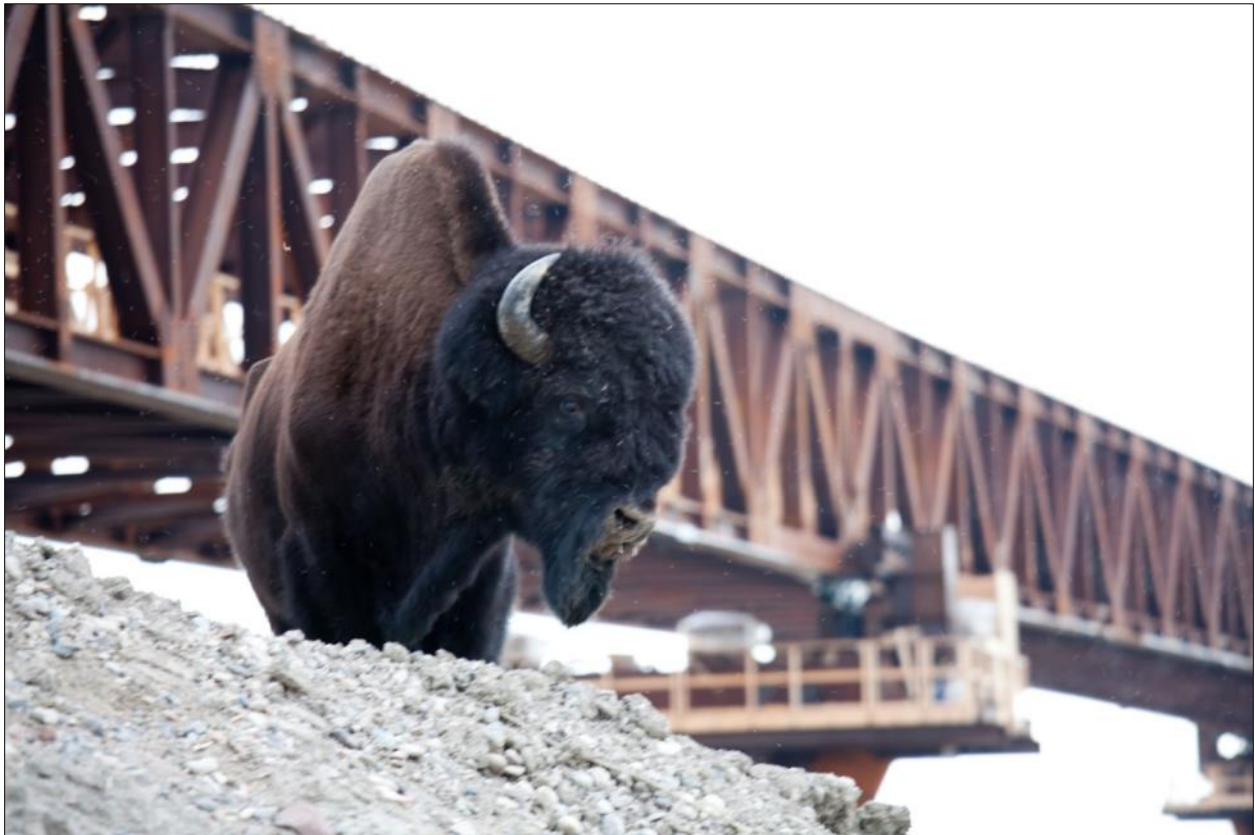


Photo 1. Bison present during the Deh Cho Bridge construction project.

2.12 Sensory Disturbances Effect on Moose and Other Large Mammals

2.12.1 Recommendation (NSMA recommendation in section 10.1 of Appendix A of their intervention)

The GNWT has improved the WMMP by acknowledging an important sensitive season for moose. However, the GNWT has not yet provided a firm commitment to using setback distances for moose and other large mammals. We would like the GNWT, within the next iteration of the WMMP, to produce a similar table of mitigation measures that will be applied to moose and other large mammals within

sensitive and less sensitive seasons (similar to that provided in Appendix E, for boreal caribou) with these minimum protective distances recognized.

2.12.2 Response

While setback distances as mitigation can be easily implemented in tundra or alpine environments, they are difficult to implement in the thick forest surrounding the TASR. For example, the photo below includes at least three bison, located approximately 50 to 80 metres away from the Old Airport Road and the photographer. The photograph was taken specifically to illustrate that wildlife near the road are virtually invisible, even in moderately open forest (burnt pine forest, in this case). The bison in this photo were only visible to the photographer because they were known to be present, having just crossed the trail in front of the photographer. The limitation associated with using setback distances in forested environments is that they assume that wildlife are detectable, and may provide a false sense of protection for wildlife. Setback distances also cannot be applied during low light, nighttime, and winter seasons with extended darkness, or heavy snowfall conditions.

As per section 4.3.1., if any big game species are sighted within the cleared right of way adjacent to the road, speed limits will be reduced within 1 km on either side of the sighting. This is in effect a buffer zone around the area of the sighting.



Photo 2. Burnt pine forest along the side of the Old Airport Road, providing cover for at least three bison (indicated with arrows) approximately 50 to 80 metres from the photographer. 20 September 2017.

2.13 Wildlife Traffic Protection Speed Reduction

2.13.1 Recommendation (NSMA recommendation in section 11.1 of Appendix A of their intervention)

As the GNWT has not yet provided a firm commitment to dealing with wildlife traffic protection, we would like the GNWT to ensure that construction vehicle stoppage mitigation, at clearly defined wildlife distances, are included within the next WMMP (V.3).

2.13.2 Response

The GNWT has provided a firm commitment with regards to managing the risk of wildlife-vehicle collisions during both construction and operation, and to reduce sensory disturbance to wildlife during construction (Sections 4.3 and 4.4 of the WMMP).

Once operational, the TASR will be managed like any other NWT highway. As it will be a public road, in general traffic will not be stopped because wildlife are near the road; however, section 4.4.2 of the WMMP identifies that the GNWT has the ability to install temporary portable signage (e.g., that could indicate a road closure for the purposes of public safety) and temporarily lower speed limits on parts of the TASR if a localized wildlife collision hazard is present. While construction will be stopped if there is a risk of wildlife injury or mortality (for example wildlife directly on the road), construction will not be completely stopped if wildlife are in the vicinity of construction but not at immediate danger. As per section 4.3.1 of the WMMP, during construction, if any big game species are sighted within the cleared right of way adjacent to the road, speed limits will be reduced within 1 km on either side of the sighting.

2.14 Pushing Caribou and Bison

2.14.1 Recommendation (NSMA recommendation in section 12.1 of Appendix A of their intervention)

The NSMA recommends that the GNWT should provide flexibility in the WMMP, to allow for additional time above the 15 minute period (up to 2 hours) for animals to clear the area naturally before they are approached on foot after 15 minutes. This is because reluctance in such individuals to move away from areas of human activity may be due to their knowledge of nearby predators.

2.14.2 Response

The GNWT will review this suggestion in the next version of the WMMP, but qualify that the duration will be subject to review through the adaptive management process described in the WMMP. As described in the WMMP, bison regularly rested and bedded near construction sites for the Deh Cho Bridge (see photo below), and it was determined in that case that deterrent actions were not required as long as human safety was not compromised and there was no risk of injury to bison.



Photo 3. Bison bedding down in the laydown area during the Deh Cho Bridge construction project.

2.15 Aircraft Mitigation for Wildlife

2.15.1 Recommendation (NSMA recommendation in section 13.1 of Appendix A of their intervention)

NSMA recommend the following:

1. That an annual audit on flight path and altitude compliance on a small subset of flights be completed and is included as part of the annual review.
2. If there are outstanding issues then GNWT will be able to improve this process and inform future road construction projects.
3. See also recommendation 5, in section 6.1 for modifying flight altitude during sensitive seasons for boreal caribou and wood bison.

2.15.2 Response

This suggestion will be considered for the WMMP V.3. However, the value of the audit is limited to the available technology mounted on the aircraft to document compliance. A limitation of concern is that it will be impossible to document the location of any wildlife that are being avoided, except for GPS collared caribou.

It should also be noted that it is not yet clear if or how frequently aircraft will be required for construction. The GNWT expects ground transportation to be utilized instead for air transportation wherever possible for logistical and financial reasons.

2.16 Rare Plants, Community Surveying and Moose Habitat Setbacks

2.16.1 Recommendation (NSMA recommendation in section 14.1 of Appendix A of their intervention)

As the GNWT has not yet provided clarification on pre-clearing surveys and setbacks for rare plant populations, wetlands, and rare ecological communities we would like the GNWT to ensure that these details are included within the next iteration of the WMMP, and that additional key habitat features (beyond dens and nests), are included for potentially occurring SAR.

2.16.2 Response

Rare plants known or anticipated in the TASR corridor are described in the Project Description Report ([PR#43, Table 6-7](#)). Herbaceous plant surveys of the Project footprint will be completed during the growing season by a qualified botanist in advance of construction, one year following construction and again after five years of operations. If rare plants and/or invasive species are found, ENR will be consulted to determine next steps. No critical habitat for species at risk has been identified within the Project area (ASR, [PR#110](#)). It is expected that the qualified botanist will survey the area in advance of construction using sound methodology and the results and recommendations of this survey will be discussed with the GNWT the order to establish the preferred approach should any next steps be required.

2.17 Bison Setbacks

2.17.1 Recommendation (NSMA recommendations in section 15.1 of Appendix A of their intervention)

NSMA recommendations, pertaining to bison setbacks and sensitive periods, are as follows:

1. That the table (Timing Restrictions and Setback Distances) in V.1 of the WMMP, or a similar table be put back into the WMMP, and that setback distances for bison be clarified/added to it.
2. Add an additional setback of 10 m, where drivers will stop construction vehicles when bison are near a roadway (after slowing vehicles down).

3. Include a year-round minimal setback of 250 m for stopping development activities when bison are in the area, and a setback of 500 m during sensitive periods.
4. Set a blasting buffer area based on ensuring that bison are exposed to less than 90 decibels during blasting. This distance can be devised via noise modelling or by monitoring noise levels during blasts at the planned 500 m setback early in construction, to ensure that noise from blasts does not exceed 90 decibels within that area (adaptively and rapidly alter setback if needed).
5. The snowmobile setback distance for caribou (250 m), which were present in V.1, but were lost in V.2 of the WMMP, should be added back into the next iteration of the WMMP. And a snowmobile setback for Bison should be added.

2.17.2 Response

See responses in Section 2.12.2 for reasons why setback distances are not expected to be practical for TASR construction. Note that during operations setback distances will not be imposed on public traffic.

2.18 Setback Distances for Caribou Water Crossings

2.18.1 Recommendation (NSMA recommendations in section 17.1 of Appendix A of their intervention)

NSMA request the following:

1. As the GNWT has not yet provided a firm commitment to determining whether there are caribou water crossings that interact with the project, and adding the recommended setback distances around them (following AANDC et al., 2012), we would like the GNWT to ensure that this will be included in the next iteration of the WMMP.
2. Ensure that water crossings are included under “key habitat features” (Section 19.0) along with appropriate buffers.

2.18.2 Response

GNWT is not aware of any barren-ground caribou water crossing on or near the TASR alignment. Figure 1 displays known water crossings (pink lines) used by the Bathurst caribou herd based on a review of traditional knowledge data at a meeting of the Bathurst Range Plan working group held June 22, 2016. As such, setback distances for caribou water crossings should not be necessary for the TASR project.

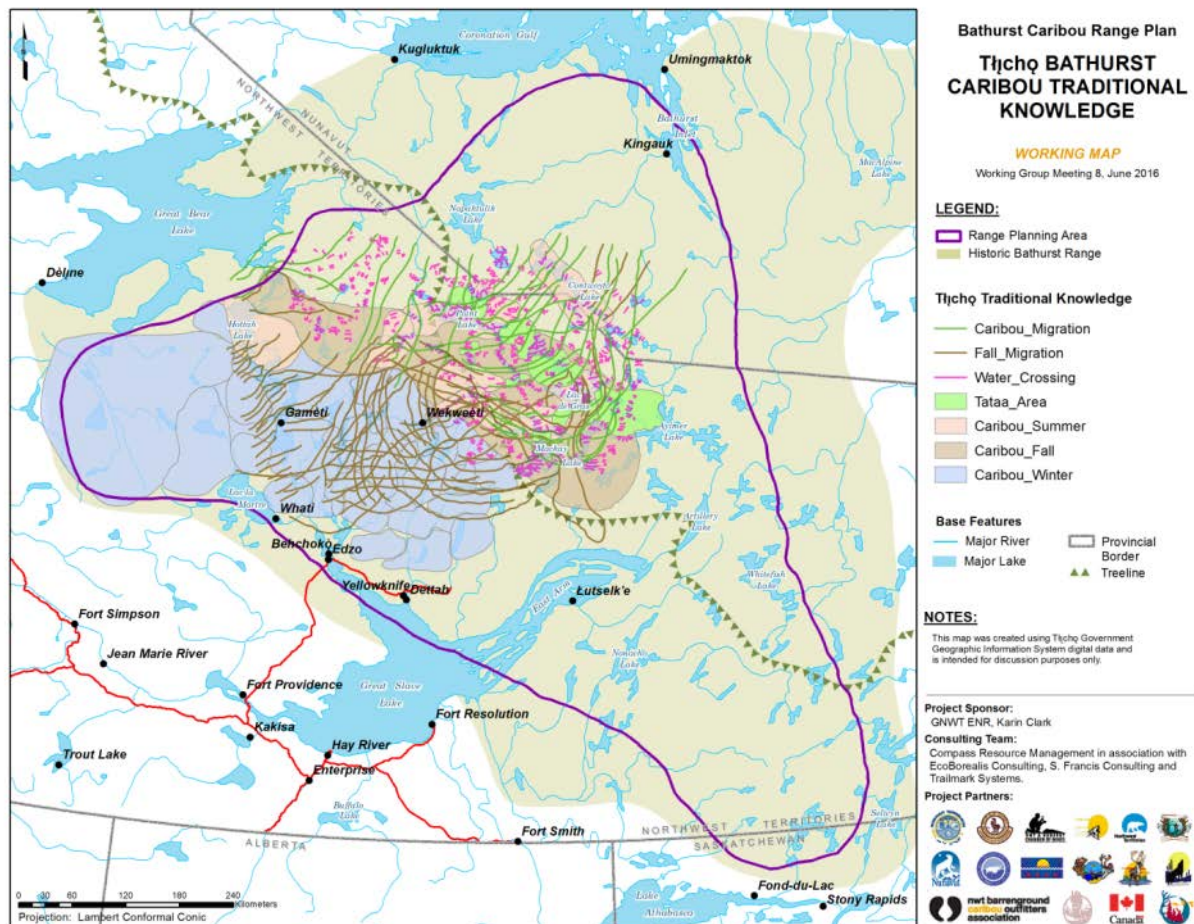


Figure 1. Barren-ground caribou water crossings identified at a Bathurst Caribou Range Plan meeting to review Traditional Knowledge data held June 22, 2016.

2.19 Mitigation to Reduce Disturbing Caribou in Sensitive Periods

2.19.1 Recommendation (NSMA recommendation in section 18.1 of Appendix A of their intervention)

We would still like the GNWT to acknowledgement of the issues associated with limited visibility in extended dark periods and to propose solutions to deal with this limitation within the next iteration of the WMMP. There are now numerous infrared scopes that can greatly increase detections of wildlife in the dark, at far distances. We recommend that the GNWT look into infrared scopes proposed for monitoring at the Back River mine project in Nunavut.

2.19.2 Response

The GNWT certainly acknowledge this issue, but notes also that the Back River Project is situated in the barren lands, where vegetation does not impede the line of sight. We refer the NSMA to the response in Section 2.12.2 describing that the difficulty with detecting wildlife in the heavily vegetated surroundings of the TASR. Areas of dense vegetation can impede detection of wildlife using infrared scopes (Cilulko et al. 2013). In the case of the TASR, it is primarily the thick forest that limits the detectability of large mammals, a limitation that is exacerbated in low light conditions.

2.20 Pre-Construction Surveys for Wildlife Features of Species at Risk

2.20.1 Recommendation (NSMA recommendation in section 19.1 of Appendix A of their intervention)

As the GNWT has not yet provided a firm commitment to appropriate survey methodologies for key, potentially occurring habitat features for species at risk, we would like the GNWT to ensure that these details are clearly articulated within the next version of the WMMP.

2.20.2 Response

The GNWT has committed to pre-clearing surveys for migratory bird nests if clearing is required during the migratory bird nesting season, for bat roosts if vegetation clearing is required between spring and fall, and for carnivore dens. As these surveys will likely be singular efforts in advance of vegetation clearing rather than part of an on-going monitoring program, and as the methods used will depend on Project construction details that are yet to be finalized, they will be added to the WMMP as they are developed, or if and when they are needed. These surveys will require a wildlife research permit, so interested parties will have the opportunity to review and comment on the proposed methods before they are initiated. The results of these surveys will be communicated in the annual WMMP reports.

2.21 Non-Native/Invasive Species Monitoring

2.21.1 Recommendation (NSMA recommendation in section 20.1 of Appendix A of their intervention)

We are very pleased with this addition to the WMMP. We would recommend one more survey, to be done by a qualified botanist, 10 years after the start of road operations, as northern invasive species can be slow to establish.

2.21.2 Response

The GNWT will incorporate this suggestion in the next version of the WMMP.

2.22 Adaptive Management for Wildlife

2.22.1 Recommendation (NSMA recommendation in section 21.1 of Appendix A of their intervention)

We suggest that the GNWT include a conceptual option for immediate adaptive management (options that do not need to follow weekly or annual reports). For instance, if a certain activity is causing distress in a SAR, the environmental lead on site should have the authority to halt activity and to increase or alter the mitigation to prevent further impacts.

2.22.2 Response

In agreement with the recommendation, the WMMP provides several examples of where the Project Supervisor and Environmental Monitors may implement additional mitigation as required (or halt construction activity if required), and a mechanism for documenting and reporting any additional mitigation. Additional mitigation would typically be implemented following a Wildlife Incident investigation (WMMP Section 5.1.6). These instances would be documented and circulated in the Weekly Report (WMMP Section 6.1.1) and reviewed in the Mitigation Audit (WMMP Section 6.2.3). The Tłıchǵ Government will assist in providing traditional knowledge to guide WMMP adaptive management ([PR#216](#)).

2.23 Monitoring for Traffic Effects on Wildlife

2.23.1 Recommendation (NSMA recommendation in section 22.3 of Appendix A of their intervention)

After independently reviewing available literature, we concur with Golder that the cut-off of 200 vehicles per day, during sensitive seasons for wildlife, is reasonable based on limited relevant studies available and the precautionary principle. However, we do request that exceedances of this vehicular rate threshold be examined within two additional sensitive seasons for ungulate and bovid SAR: post-calving and the rut periods (Sections 30, 15).

While we do not disagree with the GNWT proposed traffic threshold, there are insufficient data and studies to enable a high degree of confidence in a traffic threshold for use along the TASR, largely due to minimal studies relating low traffic roads and traffic rates to the species of interest. For this reason, the traffic and radio-collar data collected for boreal caribou will be highly valuable for filling in data gaps in our existing understanding of the responses of species to temporal

variations in traffic rates along low traffic roads in northern boreal forests. For example, combining boreal caribou collar data with real-time traffic rates by location will enable the proponent to examine step length and redirection of collared caribou, in relation to road proximity and associated traffic rates. These data will enable the proponent to look for patterns in avoidance and deflection, or road use, by caribou in different seasons and at various traffic rates. This sort of study may be used to answer threshold questions more definitively, and to adjust the threshold, if needed. For this reason, we highly recommend that the GNWT collect, and keep, minute-by-minute traffic data, and to use those data to conduct a finer-scale statistical analysis of seasonal and daily variability in traffic linked to effects on collared boreal caribou (and other wildlife). When sufficient data are available to draw conclusions, this sort of study will serve to greatly inform effects assessments, and mitigation, in the future.

2.23.2 Response

The WMMP describes that traffic data will be collected for the TASR, as it is for other NWT highways. The results will be included in annual GNWT highways reporting, as well as a breakdown of the monthly average traffic levels for the TASR within the WMMP report (WMMP Section 5.2.1). The GNWT will address the request to link the results also to wildlife sensitive periods for the next version of the WMMP.

It should be noted that while the permanent traffic counters record the cumulative observation every hour, a traffic counter is a stationary sensor that does not provide information on the location of vehicles on the road. Nor is it within the ability of the GNWT to do so for both technological and privacy reasons. As such, there are limits to the scale of analysis that can be performed.

2.24 Monitoring for Effects Around Road Salt Application Locations

2.24.1 Recommendation (NSMA recommendation in section 22.3 of Appendix A of their intervention)

As the GNWT noted in response to a question submitted by the NSMA prior to the technical hearing (Topic 17, q. 1) “In rare instances, limited amounts of sodium chloride may be necessary to ensure road safety”, we recommend recording all locations and dates that sodium chloride is applied to the road and reporting those in the annual WEMP. Woodland caribou dramatically increase mineral licking behaviour along roads during the rutting period (Tripp et al., 2006), and we expect that caribou and bison may be attracted to sites where sodium chloride has been applied, particularly in the fall. This may, in turn, lead to increases in vehicular mortality risk. Careful documentation of sodium chloride application locations,

along with dates, will aid in correlating collisions with such locations, and may aid the GNWT in adaptive management to deal with this issue (e.g., warning signs around such locations), if needed in the future.

2.24.2 Response

Currently, the GNWT operation and maintenance highway crews document the amount of salt used on Highway 3 and where these applications occur. Typically, salt application occurs before and after corners. The GNWT can continue to carefully document the use of sodium chloride on Highway 3 should it approach the junction to the TASR and if it is ever used in rare instances on the TASR.

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Tłıchọ All-Season Road

GNWT Technical Report Responses to the Wek'èezhì Renewable Resources Board

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tìchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokò from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01.

On 11 October 2017, the Wek'èezhì Renewable Resources Board (WRRB) submitted their technical report to MVEIRB for the TASR Project outlining recommendations on remaining topics of concern ([PR#215](#)). This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

To facilitate cross-referencing with the PDR and other relevant documents already submitted to the MVEIRB public registry for EA1617-01, this document refers to documents by their public registry number (i.e., the PDR is referred to as [PR#43](#)).

2 RECOMMENDATION AND RESPONSE

2.1 Barren-ground Caribou: Assessment Endpoint

2.1.1 Recommendation (WRRB recommendation 4.2.1iv)

The WRRB recommends that the Assessment Endpoint should be revised to use a definition that is applicable to the herd's current state and to integrate the Assessment Endpoint within the context of herd and range planning goals and objectives.

2.1.2 Response

The application of “self-sustaining and ecologically effective population” as the assessment endpoint for caribou was explained in the response to the Information Request WRRB IR#01 ([PR#149](#)). This assessment endpoint permits clear and unambiguous significance determination.

The ASR conclusions are in full agreement with the WRRB that barren-ground caribou are threatened. As highlighted in the WRRB technical report, barren-ground caribou were not considered self-sustaining and ecologically effective in the Base Case. This represents a significant adverse cumulative effect under existing conditions. Any contribution from a project to this existing significant adverse effect would also be significant. The reason that a significant effect was not identified for the TASR was because the ASR did not identify any impact from the Project to barren-ground caribou when their populations are at the current threatened level (i.e., not self-sustaining and ecologically effective). The TASR therefore does not contribute to the significant adverse cumulative effect present under existing conditions.

2.2 Barren-ground Caribou: Measurement Indicators

2.2.1 Recommendation (WRRB recommendation 4.2.2iv)

The WRRB suggests that to increase certainty in the predicted effects that the Measurement Indicators be revised to clarify and justify the use of vegetation classes as the only indicator for habitat and the implications of the restriction. The Developer should clarify the likely effect sizes for all three measurement indicators and the likelihood of detection through the proposed monitoring.

2.2.2 Response

A description of the measurement indicators for wildlife and their use in the ASR is provided in Section 4.1.2 of the ASR ([PR#110](#)). The measurement indicators were appropriate for meeting the Terms of Reference and Adequacy Statement. Land cover data was reclassified as moderate to high suitability based on information

from the scientific literature and other reports in order to quantify changes to the amount of suitable habitat relative to different development scenarios. This approach is consistent with recent NWT environmental assessments (e.g., NICO, Gahcho Kué and Jay Project) and provides a precise measurement of landscape change through the assessment cases. Use of vegetation classes to describe habitat is wide-spread and used in both research on Bathurst caribou (e.g. Anderson and Johnson 2014; Johnson et al. 2005; Golder 2016b) and to inform wildlife conservation and management (Chetkiewicz and Boyce 2009; Hebblewhite and Merrill 2008; Nielsen et al. 2006, 2008; McLoughlin et al. 2005).

The magnitudes of residual effects to measurement indicators for each VC can be found in ASR Section 4.6.2.

Monitoring described in the WMMP is not intended to be linked to the predicted effect size. In many cases, the ASR predicts a small or unmeasurable effect. For example, where pathways were classified as Secondary or No Linkage in the ASR (summarized in Table 4 of the WMMP) the predicted effect is expected to be negligible or non-measurable, yet are considered in the WMMP regardless. The level of effort proposed in the WMMP is intended to meet the information needs for Project and wildlife management, regulatory guidelines, or to provide triggers for more intensive monitoring.

2.3 Barren-ground Caribou: Temporal boundaries

2.3.1 Recommendation (WRRB recommendation 4.2.3iv)

The WRRB recommends that (i) the intensity and methods for monitoring and mitigation be described relative to changes in the cycle of Ɂekw̨ abundance, and (ii) the Developer clarify the duration of the monitoring and mitigation for the TASR operation with criteria for the continuation of monitoring and mitigation.

2.3.2 Response

The WMMP is primarily intended to mitigate impacts to wildlife during TASR construction, and to show how the GNWT mandate for wildlife management will be extended to the TASR. As stated in the WMMP, there is a commitment to implement the WMMP for at least five years post-construction, following which the continued need for the WMMP would be evaluated following the preparation of a Comprehensive Report (WMMP Section 6.1).

The intensity of monitoring will be adapted, as necessary, through the process of adaptive management described in the WMMP (Section 6.2), but the frequency of barren-ground caribou interaction with the TASR area has been low over past decades. This was confirmed through a review of satellite collar, aerial survey and

traditional knowledge sources (see responses to WRRB IR#6 [[PR#134](#)] and from the WRRB and GNWT meeting on 23 August 2017 [[PR#188](#) and [#189](#)]). All the lines of evidence considered support the conclusions of the ASR and increase confidence that there is a low potential for barren-ground caribou to interact with the Project during periods of low abundance and that the small potential effects described in the ASR for a scenario where barren-ground caribou populations recover to historic levels have not been underestimated.

The GNWT has a mandate to manage wildlife populations in the Northwest Territories, which is independent of the TASR and the WMMP, and this would continue regardless of whether the Project moves forward, or whether the WMMP terminated at the recommendation of the Comprehensive Report. The GNWT also refers the WRRB to specific initiatives relevant to long-term monitoring and management of barren-ground caribou at the range scale, including the Cumulative Impact Monitoring Program, the Bathurst Caribou Range Plan, the co-management process outlined in the Ṯchq̱ Agreement and the Bathurst Caribou Advisory Committee.

2.4 Barren-ground Caribou: Spatial boundaries (Regional Study Area)

2.4.1 Recommendation (WRRB recommendation 4.2.4iv)

The WRRB recommends that the 35-km corridor be considered as a local study area while the current RSA be revised to be the same as the Bathurst zekw̱ winter range (below the treeline), a total area of 211,821 km².

2.4.2 Response

Justification for the study area used for barren-ground caribou has been provided in responses to WRRB IR#3 ([PR#134](#)) and the MVEIRB IR#2 ([PR#133](#)). The study area used for barren-ground caribou was conservative, considering that the TASR lies outside of current estimates of Bathurst and Bluenose East herd distribution (see ASR Section 4.2.2.2), and the study area included the areas historically used by barren-ground caribou as identified by traditional knowledge ([PR#28](#)) and the reasonably foreseeable future developments defined by the MVEIRB Adequacy Statement ([PR#70](#)). Changing the study area would not alter the main conclusion of the ASR, which is that the Project is only likely to affect barren-ground caribou in periods of high population abundance, and that any effects during these periods would be small.

The Developer has also responded to WRRB questions regarding the number of collared caribou that have entered the study area (none from either the Bathurst or

Bluenose East herds since collaring began in 1996, WRRB IR#6, [PR#134](#)). In previous information requests for boreal caribou, the WRRB has requested analyses at a smaller range than was provided in the ASR (WRRB IR#8 and #9, [PR#134](#) and [142](#)).

Table 4.1-2 of the ASR incorrectly states the RSA size for Bison. The correct RSA size for Bison is reported in Table 4.2-19, which is 2,749,736 ha and was the area considered for the assessment of Bison.

For the ongoing monitoring of barren-ground caribou proposed in the WMMP, mitigation will be implemented for any barren-ground caribou observed within the Project footprint, and the study area for collared caribou is not confined to a pre-determined spatial boundaries, but rather will be defined by the location data obtained from collared caribou.

2.5 Barren-ground Caribou: Base Case Conditions (Distribution)

2.5.1 Recommendation (WRRB recommendation 4.2.5iv)

The WRRB's recommendations are to increase understanding of the likely exposure of Ɂekwò to the TASR and the implications for Ɂekwò recovery. The WRRB recommends a revised and more collaborative approach to reduce uncertainty in describing exposure of the Ɂekwò to the Project through a more thorough examination of all available evidence and analyses. Specifically, the WRRB recommends (i) an examination of the relationship between indicators for abundance and winter distribution over the cycles of abundance; (ii) analyses to estimate the annual variability in the location and edges of winter ranges, and when and whether trends are measurable; and, (iii) the extent to which trends in environmental conditions correlate with winter distribution.

2.5.2 Response

Several lines of evidence were considered to determine the potential of barren-ground caribou to interact with the Project, and the range delineations are consistent with accepted approaches currently used in caribou management initiatives employed by the GNWT and co-managers, including the WRRB. These include numerous range distributions estimated from collared caribou and by different investigators (ASR Appendix G). As described in the response to WRRB IR#03 ([PR#134](#)), the TASR is completely outside the annual range of the Bluenose East caribou herd and outside the 99% utilization distribution of the Bathurst Caribou herd based on collar data. These extents would include the larger ranges that have been observed when these herds were at greater abundance than they are currently. The GNWT recognizes the limitations of collaring data for providing a

complete picture of historical shifts in distribution and therefore included TK sources of harvest information ([PR#28](#)) to account for the real possibility that barren-ground caribou could at some point enter or re-occupy areas beyond the identified range boundaries. However, the weight of evidence provided by harvest studies, additional collar analyses and ENR survey data as undertaken in responses to WRRB IR#06 ([PR#134](#)), WRRB IR#05 ([PR#145](#)) and the response to Technical Session commitment #3 ([PR#189](#)) supports the notion that there will be low interaction of barren-ground caribou with the Project.

Overall, the GNWT agrees that Bathurst caribou use of their winter range is variable and that there is some uncertainty about how barren-ground caribou winter distributions may change in future and as the herd recovers. The GNWT also agrees that there are some interesting ecological questions relevant to herd dynamics that could be addressed by the questions WRRB raises, however, the GNWT does not believe that a re-examination of the location and variability of the edge of the winter range will improve the degree of certainty inherent in the effects assessment such that conclusions or mitigation approaches will need to change. From an exposure to disturbance perspective, the likelihood of exposure of barren-ground caribou to the potential impacts of the TASR are not likely to be greater than those that would be associated with the existing winter road to Whatì. The traffic levels associated with the Whatì winter road, identified in Table 5.2-3 of the ASR, are on par with what is predicted for the TASR. Section 5.2.4 of the WMMP identifies a trigger for potential mitigations in the event that groups of barren-ground caribou are near the road, which could be considered an improvement on existing mitigations on the Whatì road; thereby representing a more protective approach to minimizing disturbance compared to baseline. Section 4.4.2 of the WMMP also identifies that the GNWT has the ability to install temporary portable signage and temporarily lower speed limits on parts of the TASR if a localized wildlife collision hazard is present (such as a large herd of caribou trying to cross). A temporary road closure could also be initiated for the purpose of minimizing disturbance to barren-ground caribou and public safety concerns due to risk of vehicle collisions if there was evidence that a large group was likely to migrate across the road. Further discussion with wildlife co-management partners is necessary.

To conclude, the body of evidence supports the conclusion of the ASR that barren-ground caribou have low interaction potential and that any disturbance or movement effects they may experience by the Project if they do enter the project area should not exceed baseline levels experienced along the current Whatì winter road.

2.6 Barren-ground Caribou: Base Case Conditions (other than ɹekwò distribution)

2.6.1 Recommendation (WRRB recommendation 4.2.6iv)

The WRRB recommends that the Base Case be revised to include updated and additional information, including but not limited to (i) behavioral responses described for other all-season gravel roads with and without harvesting, and (ii) a complete account of the range of natural variation in the survival and reproduction information as well as a more complete account of harvest levels and locations.

2.6.2 Response

Please see the response to 2.5.2 regarding the potential for barren-ground caribou to interact with and realize Project-related effects and the precautionary approach applied in the ASR.

A description of existing disturbance was provided in Section 4.2.3.2 although not quantified. Existing developments cover an area of 2,542 ha (0.3%) of the barren-ground caribou RSA. As described in the ASR, there is little development in the RSA at the Base Case. Fire disturbance less than 40 years old in the RSA covers an area of 579,862 ha (57.9%). The areas quantified for the Base Case do not change the conclusions of the ASR.

Barrier and Johnson (2012) completed calculations based on lichen abundance to determine the carrying capacity of the Bathurst caribou winter range. The results indicated that lichen stores on the Bathurst winter range below the treeline were sufficient to support from 240,186 to 480,372 caribou. The most recent estimate of Bathurst caribou is approximately 20,000 animals or about 10 to 20 times lower than the carrying capacity estimated by Barrier and Johnson (2012). This indicates that winter forage is not likely to be limiting when caribou abundance is low.

Ranges of survival and reproduction of barren-ground caribou from the literature are provided for in the Base Case in Section 4.2.3.2 of the ASR. Review of harvest information sources and the documented harvest locations and levels was provided in WRRB IR#5 ([PR#145](#)) and in the response to the Technical Session Commitment #3 ([PR#189](#), [PR#190](#)).

A literature review and summary of effects from roads was completed and submitted as Appendix G of the WMMP. The results of this literature review support the conclusions about effects described for the Project in the ASR. The NSMA Technical Report ([PR#214](#)) also provided a literature review, which provides

similar conclusions as Appendix G regarding the response of large mammals to varying levels of traffic.

Behavioral responses with and without harvesting were considered in the ASR. For example, Section 4.2.3.3 of the ASR points out that patterns of seasonal avoidance in fall and winter by moose in Ontario has been attributed to use of roads by hunters (McLoughlin et al. 2011). Although the Project will allow hunters to travel more efficiently, hunting and harvesting are present along the length of the Old Airport Road and adjacent trails during the Base Case ([PR#28](#)). Consequently, harvest pressure will not be new to the area as a result of the Project, and changes in wildlife behavior due to harvesting associated with the Project are not expected to be substantial, particularly given that the Whatì winter road will no longer be in operation.

2.7 Barren-ground Caribou: Mitigation

2.7.1 Recommendation (WRRB recommendation 4.2.7iv)

The WRRB recommends the following:

1. The WMMP needs to be revised to clarify the relationship with the ASR's Measurement Indicators ([PR#110](#)).
2. The WMMP needs to be revised to address likely effect size, range of natural variation and the monitoring effort likely needed to detect an effect size.
3. Revisions to the WMMP should specify the development of criteria to measure effectiveness of mitigation and how thresholds are specifically applied to changes in mitigation and monitoring (adaptive mitigation).
4. The range of monitoring techniques and mitigation actions should be expanded (see preceding text) to use the experience gained from elsewhere and especially for the operational phase.
5. A collaboratively developed oversight committee and an access management plan for wildlife harvesting with recommendations based on community-based monitoring and adaptive mitigation to manage access and harvest monitoring. The plan should describe criteria for temporary closure related to wildlife or weather.
6. Monitoring and mitigating cumulative effects be addressed with specific criteria, thresholds and timeframes consistent with herd management planning and the draft Bathurst Caribou Range Plan.

2.7.2 Response

Response to Recommendation 1 (WRRB's recommendation 4.2.7iv(i))

While the WMMP monitoring was categorized by the ASR pathways of effect (which were in turn identified through consultation and Project scoping), the monitoring can also be categorized by the ASR measurement indicators. The list below includes the ASR measurement indicators and the associated WMMP Pathway Categories. The monitoring proposed for each Pathway Category is listed in Table 4 of the WMMP.

- Habitat availability (i.e., quantity and quality): changes to the amount of different quality habitats (e.g., hectares), and animal use of available habitat.
 - Applicable WMMP Pathway Categories: Direct Habitat Loss, Indirect Habitat Loss or Alteration, Sensory Disturbance
- Habitat distribution (i.e., arrangement and connectivity): changes to spatial configuration and connectivity of habitats, and the spatial distribution and movement of animals.
 - Applicable WMMP Pathway Categories: Direct Habitat Loss, Indirect Habitat Loss or Alteration
- Survival and reproduction: changes to animal abundance from altering survival and/or recruitment.
 - Applicable WMMP Pathway Categories: Direct Mortality, Access and Harvesting

This information can be added to the next revision of the WMMP.

Response to Recommendation 2 (WRRB's recommendation 4.2.7iv(ii))

Monitoring described in the WMMP is not intended to be linked to the predicted effect size. In many cases, the ASR predicts a small or unmeasurable effect. For example, where pathways were classified as Secondary or No Linkage in the ASR (summarized in Table 4 of the WMMP) the predicted effect is expected to be negligible or non-measurable, yet are considered in the WMMP regardless. The level of effort proposed in the WMMP is intended to meet the information needs for Project and wildlife management, regulatory guidelines, or to provide triggers for more intensive monitoring.

Response to Recommendation 3 (WRRB's recommendation 4.2.7iv(iii))

The WMMP includes an annual Mitigation Audit, intended specifically to measure the effectiveness of mitigation (similar in concept to the study suggested by the WRRB, Braund & Associates 2013), and the Tłchq Government will assist in providing traditional knowledge to guide WMMP adaptive management ([PR#216](#)). The use of thresholds in the case of wildlife monitoring has proved difficult, as there is a lack of indicators that provide continual, unambiguous and rapid information

that can be used to define thresholds (see for example De Beers 2014). In the case of adaptive mitigation, the WMMP is consistent with other documents in the Northwest Territories (De Beers 2014; DDEC 2016; Canadian Zinc 2016), Nunavut (AEM 2017) and Alberta (Golder 2016a; 2017), and considers recent advice from the MVEIRB (2017) regarding adaptive management. The Developer would welcome specific examples from the WRRB of other wildlife monitoring programs that provide thresholds for adaptive mitigation along a public road that may be applicable to the TASR.

Response to Recommendation 4 (WRRB's recommendation 4.2.7iv(iv))

The suggestions provided by the WRRB will be considered in the next iteration of the WMMP.

The GNWT commits to the mitigation hierarchy described in the ASR Section 2.31 as it relates to managing the impacts of this project on wildlife and their habitat, understanding that the hierarchy of mitigation involves, in order of priority: avoidance, minimization, restoration, and finally, offsetting (BBOP 2017). The design of the TASR prioritized avoiding impacts altogether by primarily utilizing an existing corridor along the old Airport Road alignment to avoid creating substantial new disturbance, but it is recognized that there will be additional disturbance beyond the existing footprint. The project then minimizes impacts through actions outlined in the WMMP. With respect to restoration, the GNWT will follow the reclamation guidelines in the Northern Land Use Guidelines for quarries and borrow sources, which were developed with a view to increasing the probability of re-vegetation in these areas.

It is important to realize that offsetting, as the last step in the mitigation hierarchy, is meant to address residual losses – those measurable ecological losses remaining after all reasonable steps have been taken to avoid and minimize losses from a proposed development. Not all losses are measurable or “offsettable.” The GNWT is in the process of studying the utility, effectiveness, and legal implications of potential offsetting approaches in the context of regulatory decision making and range planning for boreal caribou and barren-ground caribou, including when and where it is appropriate and how it might be undertaken by developers. The GNWT is undertaking this work with a view to developing a policy and guidelines around the use of offsets for mitigating residual impacts from developments. Until this work is completed, the GNWT cannot commit to the implementation of specific offsets for the TASR project. This work may identify viable offsetting projects that can be undertaken by developers, when and where they are appropriate. The GNWT will need to identify appropriate funding and implementation mechanisms for this work.

Response to Recommendation 5 (WRRB's recommendation 4.2.7iv(v))

Section 4.4.2 of the WMMP states that the GNWT has the ability to install temporary portable signage (e.g., that could indicate a road closure for purposes of public safety) and can temporarily lower speed limits on parts of the TASR if a localized wildlife collision hazard is present. The GNWT believes that between the opportunities that will arise through review of annual and comprehensive reports of the TASR WMMP and in other forums such as Section 15 meetings required under the *Wildlife Act*, range planning and co-management processes under the Tłıchų Agreement for proposals of management actions and the Bathurst Caribou Advisory Committee there will be sufficient opportunity for consideration of monitoring and adaptive management that can be applied to the TASR to minimize impacts to barren-ground caribou and other valued component. The GNWT suggests that a dedicated oversight committee would add another layer of complexity, conflict duplication and review burden to the existing multiple layers of processes and meetings. The GNWT is however agreeable to establishing an overarching corridor working group that is similar to the GNWT's Inuvik to Tuktoyaktuk Highway Corridor Working Group and is not limited to wildlife. Please refer to the GNWT's separate submission to the public registry on October 27, 2017 for further details regarding this corridor working group.

Response to Recommendation 6 (WRRB's recommendation 4.2.7iv(vi))

While some of the monitoring proposed in the WMMP may contribute to existing cumulative effect initiatives and help to detect impacts in the local study area to help inform range level actions, it is not within the scope of a project-specific WMMP to monitor and manage cumulative effects. This view is consistent with GNWT's "Cumulative Effects Assessment, Monitoring and Management Framework" developed in response to Measure 8 from the NICO project environmental assessment ([PR#367](#) for EA1314-01). Cumulative effects are being addressed through the GNWT-ENR mandate to manage wildlife, and through initiatives such as the Bathurst Caribou Range Plan, Boreal Caribou Range Planning Framework and the Cumulative Impact Monitoring Program. The focus of the WMMP should remain to monitor at a scale that is appropriate to assess effects from the TASR project and to mitigate and manage impacts related to construction and operation of the TASR.

2.8 Barren-ground Caribou: Residual Effects Analysis

2.8.1 Recommendation (WRRB recommendation 4.2.8iv)

The WRRB recommends that the Residual Effects analysis be revised to more comprehensively assess incremental and cumulative effects to reduce the current uncertainty. Specifically, the WRRB recommends that (i) the relationship between

responses to harvesting and roads be re-considered, and (ii) the Developer review the implications of what is meant by 'small' effects relative to the current state of ʔekwò.

2.8.2 Response

All the lines of evidence considered to support the ASR, including Traditional Knowledge, indicate that barren-ground caribou have low potential to interact with the Project ([PR#28](#); ASR, Appendix G; responses to WRRB IR#03 ([PR#134](#)) and WRRB IR#06 ([PR#134](#)), Technical Session Commitment #3 ([PR#189](#))). These lines of evidence are clear that the Project is located at the periphery of current and historical barren-ground caribou winter ranges and is certain to be outside of core ranges.

The ASR anticipates that some barren-ground caribou may interact with the Project, but only likely when herds are at higher abundances similar to those observed in the early 1990s ([PR#28](#)). At these higher abundances, barren-ground caribou would be self-sustaining and ecologically effective and resilient to the effects predicted by the Project.

The WRRB suggests that patterns associated with barren-ground caribou with the Dempster Highway and Meadowbank access road provide examples applicable to the Project. These are roads that occur within caribou seasonal ranges on the barren-grounds. Numerous lines of evidence indicate the Project, which is located in the boreal forest, indicate there is low potential for barren-ground caribou to interact with the Project ([PR#28](#); ASR, Appendix G; responses to WRRB IR#03 ([PR#134](#)) and WRRB IR#06 ([PR#134](#)), Technical Session Commitment #3 ([PR#189](#))). Of note is that the WRRB Technical Report describes that the results of Kite et al. (2017) indicate that caribou both avoid and move closer to the Meadowbank mine road, which would be a contradictory behavioural response by caribou.

Potential effects to barren-ground caribou during periods of increased abundance are considered "small" because the area of habitat affected by the TASR is miniscule relative to the habitat used by barren-ground caribou herds, and the habitat affected by the TASR is peripheral even to historic winter distributions of barren-ground caribou. Predicted cumulative effects of the TASR and other reasonably foreseeable developments would reduce suitable habitat by only 0.2% relative to the existing disturbance in the Base Case. When the ranges used by the Bathurst and Bluenose East herds are considered, this percentage is much smaller.

Carrying capacity of the winter range does not appear to limit barren-ground caribou. Barrier and Johnson (2012) concluded that lichen stores on the Bathurst winter range below the treeline during their study could support from 240,186 to 480,372 caribou, which is greater than 10 times the most recent estimate of approximately 20,000 Bathurst caribou. The loss of a small amount of lichen supporting habitat (i.e., much less than 1%) is likely to have a similarly small effect on barren-ground caribou, even when they are at high abundance and are closer to carrying capacity of the winter range.

Reasonably foreseeable future developments (RFD) included in the ASR were determined based on overlap with Valued Component study areas and were consistent with the requirements of the Terms of Reference and Adequacy Statement ([PR#67](#), [PR#70](#)). Importantly, barren-ground caribou were included as a VC in the ASR to be precautionary and provide an assessment of potential effects to this caribou ecotype, despite the low potential for barren-ground caribou to interact with the Project. The lines of evidence supporting the ASR increase confidence that effects to barren-ground caribou have not been underestimated.

Although the TASR will result in a longer season for access into the winter ranges of Bathurst and Bluenose East (BNE) barren-ground caribou herds, there are current harvest restrictions and quotas in place which reduce the likelihood of increased harvest as a result of the TASR project. As mentioned in section 4.4.2.2 of the ASR, GNWT-ENR has implemented a no-hunting mobile conservation zone for the Bathurst herd with no hunting tags available between 2016 and 2019. The BNE herd currently has regulated harvest of 750 bulls for aboriginal hunters. While there is the potential for the possibility of increased illegal harvest due to improved access, the GNWT has proposed, as part of the WMMP, a new officer position in Whatì, more monitoring flights and working with TG and other IGOs on community-based harvest monitoring programs to minimize this risk. In the event that the Bathurst herd recovers to a point where harvest can be resumed, there will be strong consideration given by the GNWT and other wildlife co-management partners to the risks of increased access from the TASR project when determining recommended harvest levels that will apply.

2.9 Barren-ground Caribou: Conclusion

2.9.1 Recommendation (WRRB recommendation, unnumbered, section 4.2.9)

The WRRB suggests its recommendations for ʔekwò in the Technical Report can be implemented as a MVEIRB Measure. The WRRB also observes that the TASR

assessment's shortcomings can be remedied if the MVEIRB sent the operations phase back to the Parties for (i) further review to collaboratively revise the WMMP, (ii) development of specific management plans such as for access and traffic management, and (iii) the establishment of an Independent Oversight Committee, to ensure that the road's monitoring and mitigation is highly protective of Threatened *zekwò*, people and the environment, and is based on Tłchq elder's knowledge and experience as well as technical information.

2.9.2 Response

While the WRRB's submission has identified several sources of uncertainty, the GNWT does not believe that many of the recommendations "qualify" as potential Measures at this stage given that there is little discussion of WRRB's opinion on significance in its submission. With respect to the three additional recommendations in WRRB's concluding paragraph:

- The GNWT has confidence that the MVEIRB is running an environmental assessment process that can adequately consider the significance of impacts associated with both the construction and operations phase.
- There will also be an opportunity for review of the WMMP after the environmental assessment concludes ([PR#225](#)) and as per commitment 1 from the Technical Session, the GNWT remains open to meet with interested parties if requested ([PR#171](#)).
- The GNWT has proposed a comprehensive suite of access and harvest monitoring identified in the WMMP, including assigning a new officer in Whatì, moving the check station to a more appropriate location, support for community harvest monitoring and additional enforcement over project related flights.
- As noted in the Tłchq Government's Technical Report (Post-Technical Session Commitment 4, page 13; [PR#216](#)), the TG and the GNWT have committed to regular face-to-face meetings to discuss monitoring results and adaptive management. The GNWT believes that between the opportunities that arise through review of annual and comprehensive reports of the TASR WMMP and in other forums such as Section 15 meetings required under the *Wildlife Act*, range planning and co-management processes under the Tłchq Agreement for proposals of management actions and the Bathurst Caribou Advisory Committee there will be sufficient opportunity for consideration of monitoring and adaptive management that can be applied to the TASR to minimize impacts to barren-ground caribou and other valued component. The GNWT suggests that a dedicated oversight committee would add another layer of complexity, conflict duplication and review burden to already

multiple layers of processes and meeting. The GNWT is however agreeable to establishing an overarching corridor working group that is similar to the GNWT's Inuvik to Tuktoyaktuk Highway Corridor Working Group and is not limited to wildlife. Please refer to the GNWT's separate submission to the public registry on October 27, 2017 for further details regarding this corridor working group.

2.10 Łıwe (Fish): Summary of Direct Effects to Łıwe & Łıwe Habitat

2.10.1 Recommendations (WRRB recommendations 1-3, section 4.3.1)

1. To prevent impacts to waterbodies and wetlands during surveying, construction, maintenance, and monitoring of the TASR, WRRB recommends the Developer devise and implement best practices for operating all-terrain vehicles in and around water.
2. To prevent impacts to waterbodies and wetlands from members of the public operating all-terrain vehicles, the WRRB recommends the GNWT and the Tłıchǵ Government devise and publish best practices for operating all-terrain vehicles on public lands in and around water.
3. The WRRB recommends that Developer commitment #6 in Table MVEIRB-IR21-2 also include łıwe passage and regular annual inspection. The new commitment would read as follows: "Watercourses will be inspected at least annually upstream and downstream of the crossings for erosion, scour, flow blockages, and łıwe passage during the spring freshet and through the open water season, as required. Adverse effects to łıwe habitat will be minimized by culvert maintenance, including removal activities of debris (e.g., ice, beaver dams), following DFO guidance (i.e., gradual removal such that flooding downstream, extreme flows downstream, release of suspended sediment, and łıwe stranding can be avoided)".

2.10.2 Responses

Response to Recommendation 1 and 2

The vast majority of current traffic on the Old Airport Road is the public, using the trail for hunting, collecting firewood, or recreation. With the construction of the TASR water crossings, the Project will ultimately reduce the current practice of crossing streams on the Old Airport Road by all-terrain vehicle. The GNWT has also outlined mitigation to reduce impacts to water quality during construction (see the ASR Section 3.2 and response to MVEIRB IR#21 [[PR#146](#)]), mitigation will follow the relevant DFO guidance, and the GNWT has prepared an In-Field Water Analysis Plan to monitor water quality during construction. Further, the Developer notes that

the WRRB Technical Report ([PR#215](#)) concurs with the conclusion by DFO that that construction of the TASR is not likely to cause significant adverse effects to fish habitat ([PR#221](#)).

Currently, there are no legislative or regulatory requirements limiting ATV use on public land outside territorial parks. Off-road vehicle limits according to the Mackenzie Valley Land Use Regulations are the use of a vehicle with a net vehicle weight of which equals or exceeds 5 tonnes but is less than 10 tonnes or the use of a vehicle of any weight that exerts a pressure on the ground equal to or exceeding 35 kPa, other than on a road or within a community landfill, quarry site or airport. The GNWT can commit to the use of off-road vehicles in a manner consistent to the terms and conditions of the land use permit where conditions generally apply to the fording of streams.

Response to Recommendation 3

The TASR Fish and Fish Habitat Protection Plan ([PR#7](#)), the commitments made in the ASR ([PR#110](#)) and listed in the response to MVEIRB IR#21 ([PR#146](#)), all of which considers DFO guidance, are designed around ensuring the required criteria are in place for protecting fish habitat and maintaining fish passage. The details of the commitments will be finalized as part of the Project permitting stage once final designs are ready and Project construction details are known.

All NWT highways receive annual inspections for stream crossings as part of ongoing highway maintenance, and this will be extended to the TASR (described in the Fish and Fish Habitat Protection Plan). The frequency of watercourse inspection will be defined in the next version of the In-Field Water Analysis Plan during permitting. Further, the Tłıchų Government have committed to design and implement a program that uses Tłıchų traditional knowledge to monitor fish and fish habitat during construction and operation of the TASR ([PR#216](#)).

2.11 Łıwe (Fish): Summary of Indirect Effects to Łıwe

2.11.1 Recommendation (WRRB recommendation 4, section 4.3.3)

The WRRB recommends that DFO, GNWT, and Tłıchų Government work together to scope out, and, as appropriate, design and implement a Fisheries Management Plan (FMP) for the TASR corridor. The FMP would establish fishery objectives, assess yield and harvest, identify management issues and measures, clarify management and stewardship arrangements, design and implement a regulatory and compliance plan, and design an adaptive management plan. Scoping out of a FMP should be complete within 12 months of TASR receiving regulatory approval.

2.11.2 Response

Calculations completed on behalf of the GNWT indicate that additional recreational fishing on waterbodies accessible by the TASR (including Lac La Martre) is sustainable ([PR#159](#), [PR#211](#)). As noted by DFO ([PR#221](#)), potential impacts to fisheries will be cooperatively managed by the DFO, the WRRB, Tłıchǫ Government and associated communities. Further, the Tłıchǫ Government has committed to working with DFO to develop a strategy to monitor and manage impacts to fisheries that may occur when the TASR is operational, including a creel survey for the first three years of operation ([PR#216](#)).

A fisheries management plan, which may include waterbody-specific fishing regulations, would be informed by monitoring and the methods and details of such monitoring are to be finalized by the managing authorities. It is also expected that monitoring may include a creel survey as used in other jurisdictions. A creel survey would provide an indication of the locations used for fishing and the intensity of fishing prior to determining the need for changes to, or new regulations under a specific fisheries management plan. Management of the recreational fishery would be supported through the legal mechanism of the *NWT Fisheries Regulations*, as done elsewhere in the NWT.

2.12 Traditional Knowledge: Łıwe (Fish)

2.12.1 Recommendations (WRRB recommendations 1-4, section 4.4.1)

1. Monitor łwe and water with a system that coincides with Tłıchǫ knowledge—continue to build on the elders' and harvesters' knowledge (See Appendix B).
2. Allow łwe populations to recover based on elders' and harvesters' knowledge before introducing any new human activity that could add to the negative cumulative impacts on łwe and łwe habitat.
3. To prevent impacts to all waterbodies and wetlands, the WRRB recommends that the GNWT ensure that each bridge and culvert does not disrupt the seasonal flow of water in areas where Ƿelatì exist, as they feed larger creeks and rivers—łwe habitat.
4. The WRRB recommends monitoring by Tłıchǫ harvesters who have Tłıchǫ knowledge of the area with extensive Ƿelatì

2.12.2 Responses

Response to Recommendation 1

The GNWT, in conjunction with advice from the Tłıchǰ Government, provided a fulsome response to the types of ongoing community-based monitoring programs that continue to build on the elders' and harvesters' knowledge. These details were provided in response to WRRB's question 1 on fish and fish habitat monitoring ([PR#211](#)). The Tłıchǰ Aquatic Ecosystem Monitoring Program (TAEMP), a community-based monitoring program managed by the WRRB, which undertakes monitoring of water quality and fish health on lakes used by the Tłıchǰ, including Lac La Martre is anticipated to continue ([PR#211](#)). "In addition to the TAEMP/Fishcamps, the Tłıchǰ Government runs the Marian Watershed Stewardship Program (MWSP) as a separate and distinct aquatic ecosystem monitoring program, which is intended to continue traditional knowledge and scientific monitoring in the area surrounding and near the proposed NICO project" ([PR#211](#)). Please refer to PR# for the complete response.

Response to Recommendation 2

The Tłıchǰ Government has committed to working with DFO to develop a strategy to monitor and manage impacts to fisheries that may occur when the TASR is operational, including a creel survey for the first three years of operation ([PR#216](#)). As noted in the Tłıchǰ Government Technical Report ([PR#216](#)), there is consensus among the GNWT and Tłıchǰ Government that any Project impacts to fisheries can be managed through existing mechanisms. While the WRRB does not indicate which waterbodies should be the focus of management, restrictions to fisheries or a complete moratorium on selected waterbodies is currently, and will continue to be an option if there is a management concern regardless of whether the TASR proceeds. Management decisions may ultimately be informed, in part, by the Tłıchǰ Aquatic Ecosystem Monitoring Program, managed by the WRRB, which undertakes monitoring of water quality and fish health on lakes used by the Tłıchǰ, including Lac La Martre (WRRB 2017).

Response to Recommendation 3

The Tłıchǰ Government has committed to design and implement a monitoring program that uses Tłıchǰ traditional knowledge to monitor fish and fish habitat during construction and operation of the TASR ([PR#216](#)). As stated by DFO ([PR#221](#)) it is likely that impacts to fish and fish habitat can be fully mitigated based on the information provided by the Developer. The TASR Fish and Fish Habitat Protection Plan ([PR#7](#)), and the commitments made in the ASR ([PR#110](#)) and listed in the response to MVEIRB IR#21 ([PR#146](#)), which consider DFO guidance, are designed around ensuring the required criteria are in place for protecting fish habitat and maintaining fish passage, and the details of the commitments will be

finalized during the Project permitting stage once final designs are ready and Project construction details are known. The GNWT is committed to provide DFO with site-specific engineering design drawings with detailed construction, mitigation and monitoring plans, where needed.

Response to Recommendation 4

The Tłchq Government has committed to design and implement a monitoring program that uses Tłchq traditional knowledge to monitor fish and fish habitat during construction and operation of the TASR ([PR#216](#)).

2.13 Traditional Knowledge: ʔekwò (Barren Ground Caribou)

2.13.1 Recommendations (WRRB recommendations 5-6, section 4.4.2)

1. To better understand ʔekwò habitat and ensure adequate habitat is available when ʔekwò return to the project area, WRRB recommends an in depth Tłcho knowledge study on ʔekwò habitat with the project area.
2. Monitoring by Tłchq elders and harvesters who have Tłchq knowledge of ʔekwò throughout Wek'èezhì (See Appendix B).

2.13.2 Responses

As stated in the response to WRRB's September 8th TASR questions: "the GNWT is committed to supporting, subject to availability of additional resources, the Tłchq Government (TG) in the design and implementation of a program that uses Tłchq harvesters' traditional knowledge and methods to monitor the health of boreal caribou (tòdzı) and the state of their habitat, and the state of barren-ground caribou (ʔekwò) winter habitat, during and after the completion of the TASR project. Further details of the program, including monitoring questions and approach, will be determined following discussion with traditional harvesters and elders through engagement with TG, with a view it be included as a component of the Wildlife Management and Monitoring Plan (WMMP) to be finalized and approved during the regulatory phase for this project. The expertise and advice of the WRRB will also be sought in the design of the program" ([PR#211](#)).

2.14 Traditional Knowledge: Tòdzı (Boreal Caribou)

2.14.1 Recommendation (WRRB recommendation 7, section 4.4.3)

To monitor tòdzı and their habitat by Tłchq elders and harvesters who have Tłchq knowledge of tòdzı throughout Wek'èezhì (See Appendix B).

2.14.2 Response

Please see the above response (section 2.13.2) as the same response applies.

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Tłıchọ All-Season Road

GNWT Technical Report Responses To The Yellowknives Dene First Nation

**Prepared for the Mackenzie Valley
Environmental Impact Review Board EA1617-01**

27 October 2017

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1 INTRODUCTION

The Government of the Northwest Territories (GNWT) submitted a Project Description Report (PDR) and an Adequacy Statement Response (ASR) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the environmental assessment of the Tłchq All-Season Road (TASR) Project (EA1617-01) in July 2016 and April 2017 respectively. Following completion of the ASR, the GNWT provided responses to information requests (June and July 2017), and attended the Technical Sessions hosted by MVEIRB in Behchokò from 15 to 17 August 2017. Further to this, there have been numerous meetings with all Parties to the environmental assessment, for which meeting reports have been provided to the MVEIRB Public Registry for EA1617-01.

On 11 October 2017, the Yellowknives Dene First Nation (YKDFN) submitted their technical report to MVEIRB for the TASR Project ([PR#217](#)) outlining recommendations on remaining topics of concern. This report provides responses to those recommendations, with the intent of providing the Developer's perspective on these remaining topics as the Project moves into the MVEIRB Hearings Phase.

To facilitate cross-referencing with the PDR and other relevant documents already submitted to the MVEIRB public registry for EA1617-01, this document refers to documents by their public registry number (i.e., the PDR is referred to as [PR#43](#)).

2 RECOMMENDATION AND RESPONSE

2.1 Woodland Caribou Impacts

2.1.1 Recommendations (YKDFN recommendations 1-4)

1. The proponent show error assumptions, values, propagation methods used for the Environment Canada 2012 recommendation of a minimum 65% undisturbed area habitat requirement.
2. The proponent show error assumptions, values, and propagation methods used for the proponent's estimate of 66.8% undisturbed habitat in the study area.
3. The proponent incorporates traditional knowledge (TK), including but not limited to TK from YKDFN, in estimating the type and proportion of habitat necessary to ensure long-term health and viability of boreal caribou in the study area.
4. The proponent develop mitigative measures that reflect the time dependence of realized impacts imposed by permanent features such as roads.

2.1.2 Responses

Response to Recommendation 1

The ASR followed Environment and Climate Change Canada's (ECCC) boreal caribou habitat mapping guidelines (EC 2012). The guidelines provide a matrix for determining the risk relative to a range measured as percent undisturbed area (EC 2012; Figure E-1, Table E-1). The guidelines were derived from a series of analyses of cross-jurisdiction boreal caribou demographic and collar data including enhanced disturbance mapping, habitat selection analysis, anthropogenic buffer analysis and meta-analysis of caribou population and habitat condition (EC 2011). Errors associated with each component would be propagated through the population model results. In other words, the precision of the relationship between population growth rate and habitat condition would account for uncertainty associated with error at each step. The Canadian Boreal Forest Agreement has prepared a good plain language primer that explains the science behind the 65% undisturbed habitat threshold (CBFA 2016; [PR#229](#)). Total disturbance (fire \leq 40 yrs old + human disturbances buffered by 500 m) explained almost 70% of the variation in boreal caribou calf recruitment. Demographic data from boreal caribou monitoring study areas in the NWT contributed 5 out of the 24 data points used in the national analysis. The population model also considered stochastic events (e.g., extreme weather) to further provide conservatism. Further technical details on the critical habitat threshold are available in ECCC's scientific assessment of critical habitat (EC

2011; [PR#33](#)). Figure 8 in EC (2011) shows confidence intervals around the relationship between calf recruitment and total habitat disturbance. Figure 82 in Appendix 7.8 of EC (2011) displays the confidence intervals around the likelihood of population self-sustainability and total habitat disturbance, that informed the 65% undisturbed habitat threshold that defines critical habitat.

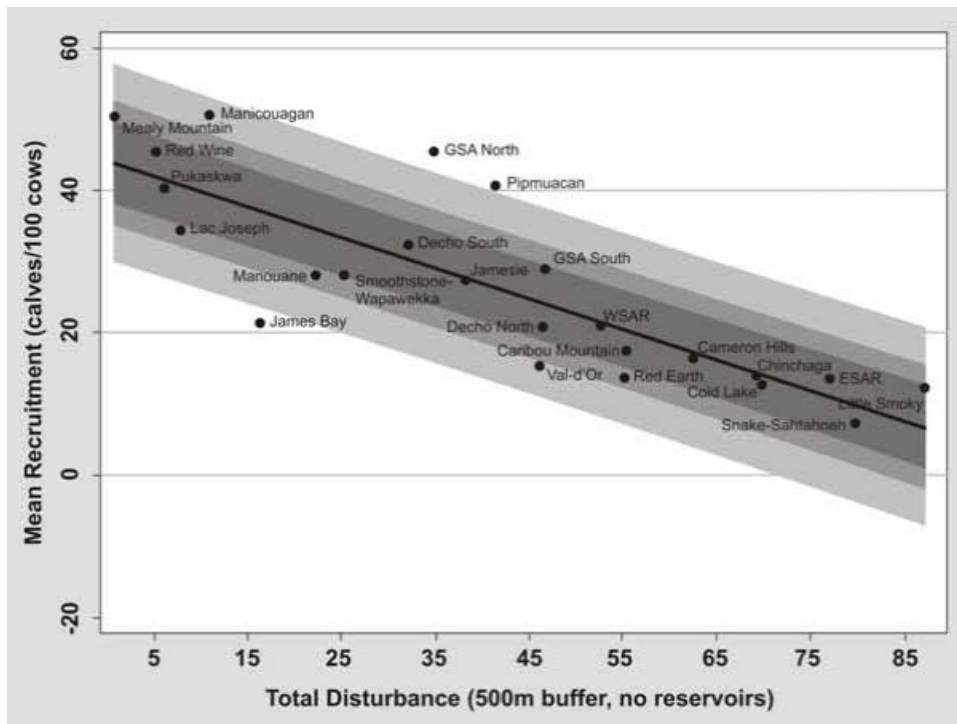


Figure 8 in EC 2011. Graph showing 50, 70 and 90 % prediction bands for the best univariate regression model (M3) of caribou recruitment and landscape disturbance. (Page 25)

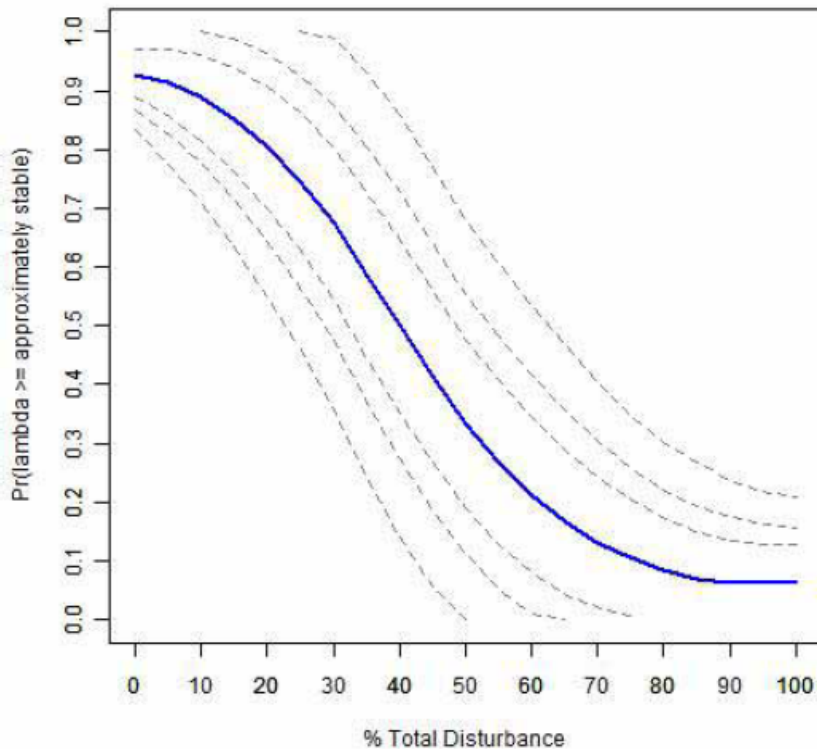


Figure 82. The estimated indicator for self-sustaining populations for the habitat condition line of evidence ($\Pr(\lambda \geq \text{approximately stable})_{\text{habitat}}$). Shown are the mean (solid blue line) and confidence intervals (dashed lines: 50% – inner pair; 70% – centre pair, 90% – outer pair), estimated for all possible values of % total disturbance using the assumptions as described in the text. Data for means and confidence intervals were smoothed using a loess algorithm.

Figure 82 from Appendix 7.8 of EC's 2011 Science Assessment Report - 7.8 Estimating Probabilistic Indicators for the Assessment of Critical Habitat for Local Populations of Boreal Caribou.

Response to Recommendation 2

Methods for habitat mapping for boreal caribou are provided in Section 4.2.2.1 of the ASR ([PR#110](#)). The methods used in the ASR to estimate habitat disturbance from the project were consistent with the methods used by EC for the national recovery strategy.

The approach in the ASR was to evaluate the relative change in habitat disturbance, therefore error associated with land cover data would be systematic through each assessment case (baseline, application, reasonably foreseeable development) so that

the differences between each assessment case reflected only those differences caused by the development modeled in each case. As noted in the previous response, the critical habitat threshold provided by EC (2012) considers numerous sources of error along with the associated risk matrix.

The ASR used ECCC's anthropogenic disturbance maps developed for the national recovery strategy, and the GNWT's fire history data, to produce updated habitat disturbance maps for the NT1 boreal caribou range that reflected conditions as of fall 2016. ECCC's anthropogenic disturbance data was based on features that were visible on 1:50,000 Landsat images from 2010. To create an updated disturbance map to reflect baseline conditions prior to construction of the TASR, the ASR updated the anthropogenic disturbance footprint by adding in footprint data from land and water board public registries for developments occurring after 2010. A 500 m buffer was applied to the updated anthropogenic disturbance layer following ECCC's methods. The 40-yr fire footprint data was updated by selecting fires from 1976-2016 in the NWT fire history data set. A 500 m buffer was applied to the TASR footprint to assess changes in habitat disturbance at the application case. There are potential sources of error in both ECCC's original anthropogenic disturbance dataset and updates to this data made for the ASR, but are difficult to quantify. ECCC's dataset may have missed human disturbance features that were not visible at the 1:50,000 scale or due to the presence of clouds on available satellite images. Updates to ECCC's data for the ASR would not have included new projects since 2010 for which no spatial data was available, and did not attempt to quantify disturbance that were mapped in 2010 but no longer visible on satellite images in 2016. Whatever sources of error that might exist in the fire data used by EC to inform the 65% threshold would have been carried through the ASR assessment, since the data used by ECCC was based on NWT's fire history data.

Response to Recommendation 3

The ASR incorporated traditional knowledge (Section 2.4) throughout the assessment including the identification of valued components, effects pathways and mitigation. The Recovery Strategy for the Boreal Caribou in the Northwest Territories also describes the inclusion of traditional knowledge as part of Objective 3 and, in particular, for information on key habitat indicators (CMA 2017). The GNWT will use available traditional knowledge to inform the development of range plans that will outline how habitat disturbance will be managed to meet the objectives of the national and territorial recovery strategies for boreal caribou.

Response to Recommendation 4

While the TASR will be a permanent feature on the landscape, the linear disturbance will not be new. The PDR ([PR#43](#)) describes the TASR route would predominantly follow the Old Airport Road, an existing overland alignment that was used up until the late 1980s as an overland winter road. Since this alignment fell into disuse as a winter road, it has continued to be used as a travel corridor and means of access for hunting and harvesting firewood by truck, all-terrain vehicle and snowmachine, along its entire length between Highway 3 and Whatı.

With regards to mitigation measures that reflect the long-term impacts of the TASR, the Wildlife Management and Monitoring Plan (WMMP;[PR#192](#)) describes the proposed TASR wildlife mitigation and monitoring during both the construction and operation phases, while the Information Request response to MVEIRB IR#21 ([PR#146](#)) outlines other developer commitments to reduce environmental impacts. Key among the mitigation described in the WMMP is the operational mitigation (WMMP Section 4.0), the wildlife effects monitoring that extends into the operational phase (WMMP Section 5.2) and the operational phase adaptive management (WMMP Sections 6.2.2 and 6.2.3).

Of note in the WMMP is the tie-in to existing and on-going wildlife mitigation monitoring conducted by the GNWT for all highways. The WMMP outlines examples of current practices to reduce impacts to wildlife (Section 2.5), and these will also be implemented for the TASR construction and operation. Further, the GNWT shares wildlife monitoring and management with the Tłı̨chų Government, the Government of Canada, and land claim agencies in a co-management framework. Each of these agencies has a shared role in identifying and providing solutions to issues as they arise.

2.2 Aboriginal Rights, Consultation and Accommodation

2.2.1 Recommendation (YKDFN recommendations 5 and 6)

1. The GNWT Department of Infrastructure, and all departments, must act in accordance with maintaining the Honour of the Crown in their dealings with Aboriginal Rights holders. These rights are enshrined in the Constitution Act 1982 and foundational documents such as Treaties.
2. That the Review Board consider its role as a third party undertaking consultation and accommodation in light of Supreme Court of Canada rulings *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.*, 2017 SCC 40 and *Chippewas of the Thames First Nation v. Enbridge Pipelines Inc.*, 2017 SCC 41.

2.2.2 Responses

Response to Recommendation 1

The GNWT is of the view that it has made multiple efforts to consult with and understand the concerns of the YKDFN in relation to TASR in efforts to maintain the honour of the Crown in its dealings with YKDFN to date during EA1617-01. Further, the GNWT is of the view that YKDFN's assertion that the GNWT has conducted itself in bad faith at multiple points in this proceeding is not consistent with the GNWT efforts outlined in the consultation and engagement record. In-fact, the consultation remains ongoing. The GNWT has encouraged YKDFN's participation in EA1617-01 since the GNWT became aware of YKDFN's concerns outside of its asserted territory. The full extent of the GNWT's consultation and engagement with YKDFN can be found in an updated Engagement and Consultation Log, which will be submitted to the Review Board for upload to the public registry on November 1, 2017.

The GNWT wishes to clarify certain points regarding the regulatory and environmental assessment submissions, as well as correspondence between the GNWT and YKDFN, from May 30, 2016 to June 26, 2017: The GNWT's original understanding of YKDFN assertions is consistent with both Chief Drygeese Territory (asserted) and Akaitcho Dene First Nations Asserted Territory not overlapping with the proposed TASR route and prior submissions by YKDFN during the Environmental Assessment of the NICO Project (EA0809-004; [PR#371](#) and [PR#387](#)).

The GNWT's understanding subsequent to the WLWB's land use permit and water licence preliminary screening and public review was that YKDFN did not assert any Aboriginal or Treaty rights in the TASR area but did have concerns about potential impacts to moose, bison and heritage resources outside of the project footprint, and to YKDFN traditional practices "immediately to the south of the proposed project" ([PR#24](#)). As a result, the GNWT committed to further consultation with YKDFN during additional regulatory stages and wildlife monitoring and mitigation planning when it responded to reviewer comments on July 4, 2016 ([PR#24](#)). On October 7, 2016, after the TASR project was referred to environmental assessment (EA), the GNWT sent a letter to the YKDFN encouraging its participation in the EA and setting out the GNWT's commitment to consulting with YKDFN during the EA process ([PR#49](#)).

The GNWT has made multiple efforts to communicate with and provide opportunities for YKDFN to share its outstanding concerns about potential impacts to barren-ground and/or woodland caribou from the TASR. The YKDFN first shared

details of its concerns with the GNWT in its Technical Report on October 11, 2017 ([PR#217](#)).

At the May 25, 2017 Adequacy Statement Response Technical Review Session, the YKDFN mentioned that it had, but did not provide details of, outstanding concerns regarding potential impacts to barren-ground and/or woodland caribou from the TASR. The GNWT subsequently sent a letter to YKDFN on June 6, 2017 seeking clarification and a full understanding from YKDFN of the nature of its concerns regarding potential impacts to barren-ground and/or woodland caribou from TASR.

Following receipt of YKDFN's June 14, 2017 letter, which did not set out any specific outstanding concerns regarding potential impacts to barren-ground or woodland caribou from the TASR, the GNWT sent a follow-up letter dated June 26, 2017, again seeking to obtain a better understanding from YKDFN of the nature of its concerns about potential impacts to barren-ground and woodland caribou. Appended to that letter was a list of concerns that had been raised by YKDFN and other parties regarding potential impacts to barren-ground and woodland caribou and steps the GNWT is taking to avoid or mitigate any potential adverse impacts to barren-ground and woodland caribou from the TASR. This June 26 letter invited YKDFN to advise Michael Conway, the Regional Superintendent of the North Slave Region of the Department of Infrastructure, by July 17, 2017, of the specific outstanding concerns YKDFN had regarding potential impacts to barren-ground and/or woodland caribou from the TASR ([PR#123](#)).

Additional opportunities to participate were extended to YKDFN, including the following:

- YKDFN was invited by the Review Board to attend the Technical Session held from August 15-17, 2017 in Behchokò ([PR#137](#)), but did not attend.
- The GNWT invited YKDFN to the GNWT's TASR Wildlife Monitoring and Management Plan (WMMP) Overview Session held at the Tree of Peace in Yellowknife on September 28, 2017 from 1-4 p.m. YKDFN accepted this invitation but did not attend.
- The GNWT invited YKDFN to a second overview session for the WMMP on October 3, 2017. YKDFN accepted this invitation but did not attend the session.

As of October 24, 2017, the GNWT had not been advised of any outstanding concerns regarding potential impacts to barren-ground and/or woodland caribou. The GNWT understands that the time that YKDFN staff can spend on EA1617-01 is limited; however, the GNWT believes that it would not have been onerous for the

YKDFN to advise the GNWT of any outstanding concerns regarding potential impacts to barren-ground and/or woodland caribou.

On October 24, 2017, after reviewing YKDFN's technical report, the GNWT sent a letter to YKDFN encouraging YKDFN to consider any further recommendations it may wish to make to prevent likely significant adverse impacts of TASR on woodland caribou, inform the GNWT of any recommendations prior to the public hearing and convey any further recommendations to the Mackenzie Valley Review Board at the public hearing in Whatì from November 15-17, 2017 ([PR#230](#)). Additionally, the GNWT has advised YKDFN that it is making transportation to and from the hearing available to the YKDFN, as a registered party to the EA and YKDFN has informed the GNWT how many seats it would require.

Finally, as stated in the cover letter for the GNWT's responses to technical reports, the GNWT is open to meeting with any of the parties before the public hearing to discuss the GNWT's responses to technical reports in more detail.

Following receipt of MVEIRB's report of environmental assessment (REA), the GNWT will write to all Indigenous governments and Indigenous organizations, including the YKDFN, to seek their views on whether potential adverse impacts of the proposed TASR on asserted or established Aboriginal and/or Treaty rights have been fully addressed in the REA, assess whether any additional accommodations are required and thereby maintain the Honour of the Crown prior to any decision being made by the responsible ministers under section 130(1) of the *Mackenzie Valley Resource Management Act*.

Response to Recommendation 2

Although this YKDFN recommendation is directed to the Review Board, the GNWT wishes to note that the MVEIRB is not a final decision-maker for the TASR. This is in contrast to the National Energy Board's final decision-making role in the two cited decisions. The MVEIRB is not required to assess the adequacy of Crown consultation and accommodation or fulfill the Crown's duty to consult and accommodate prior to issuing any environmental assessment report. The responsible ministers are the final decision makers and rely on the Review Board's environmental assessment process to assist in fulfilling the duty to consult and accommodate. This reliance on the Board process is further described in GNWT's October 7, 2016 letter to YKDFN ([PR #49](#)).

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