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ECCC File: 5300 000 048/003  
MVEIRB File: EA-1617-01

October 11, 2017

via email to: [stoogood@reviewboard.ca](mailto:stoogood@reviewboard.ca)

Simon Toogood  
Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
P.O. Box 938  
Yellowknife, NT X1A 2N7

Dear Mr. Toogood:

**RE: EA-1617-01 – Government of the Northwest Territories  
– Tłı̄chq̄ All-Season Road – Final Technical Report**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) regarding the above-mentioned proposed project and is submitting the attached Final Technical Report via email as requested by MVEIRB. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

Should you require further information, please do not hesitate to contact Bradley Summerfield at (867)669-4707 or [Bradley.Summerfield@canada.ca](mailto:Bradley.Summerfield@canada.ca).

Sincerely,

Margaret Fairbairn  
A/Regional Director

Attachment: Environment and Climate Change Canada's Final Technical Report  
cc: Georgina Williston, Head, Environmental Assessment North (NT and NU),  
EPOD-PNR



ENVIRONMENT AND CLIMATE CHANGE  
CANADA'S  
TECHNICAL REPORT TO THE  
MACKENZIE VALLEY ENVIRONMENTAL  
IMPACT REVIEW BOARD

RESPECTING  
THE TŁĮCHQ ALL-SEASON ROAD  
PROPOSED BY  
THE GOVERNMENT OF THE  
NORTHWEST TERRITORIES

October 11, 2017

**Government of the Northwest Territories Tłı̄chǫ All-Season Road  
Environment and Climate Change Canada  
Technical Report to the Mackenzie Valley Environmental Impact Review Board**

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## 1.0 List of Acronyms

CCME	Canadian Council of Ministers of the Environment
CEPA	<i>Canadian Environmental Protection Act</i>
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWQGPAL	Canadian Water Quality Guidelines for the Protection of Aquatic Life
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
ESC Plan	Erosion and Sediment Control Plan
MBR	<i>Migratory Birds Regulations</i>
MBCA	<i>Migratory Birds Convention Act</i>
MVEIRB	Mackenzie Valley Environmental Impact Review Board
RSA	Regional Study Area
SARA	<i>Species at Risk Act</i>
TASR	Tłı̨chǫ All-season Road
TSS	Total Suspended Solids
VC	Valued Component
WMMP	Wildlife Management and Monitoring Plan

## 2.0 Executive Summary

The Government of the Northwest Territories' (the Proponent) Tłı̨chǫ All-Season Road (TASR) Project (the Project) consists of the construction and operation of a 94 km all-season access road from Highway 3 to the community of Whatı̨. Project construction is proposed to take place over four years and will consist of a two-lane gravel road with culverts and double lane bridges over rivers and streams.

Environment and Climate Change Canada (ECCC) participated in the Environmental Assessment (EA) process to date, providing information requests and technical comments to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) and attending the Technical Sessions held in Bechokǫ from August 15<sup>th</sup> to 17<sup>th</sup>, 2017. This technical report summarizes the results of ECCC's review of the information provided throughout the EA process that is within ECCC's mandate. This technical report also provides ECCC's expert advice on the Proponent's assessment of the environmental effects and proposed mitigations, and identifies outstanding concerns and recommendations for consideration by MVEIRB.

ECCC has identified concerns regarding potential acid rock drainage and metal leaching from borrow sources for road construction. In response, the Proponent has committed to avoiding borrow sources that are potentially high or moderately acid generating. ECCC is satisfied with the Proponent's commitment and has no further outstanding concerns regarding acid rock drainage and metal leaching at this time.

ECCC has discussed potential impacts from the Project to water quality. Concerns regarding the Erosion and Sediment Control Plan (ESC Plan), ability to respond to thaw and/or erosion events and the need to identify lessons learned from other northern projects have been discussed. The Proponent has committed to addressing these concerns during the Water Licensing process. ECCC is satisfied with the Proponent's commitment and notes that the ESC Plan, response measures and lessons learned could be reviewed during the regulatory phase if they are provided upfront with the Water Licence Application.

ECCC has provided advice on additional mitigation, monitoring and thresholds for the In-Field Water Analysis Monitoring Plan. The Proponent has committed to providing an updated In-Field Water Analysis Monitoring Plan during the Water Licencing process. ECCC notes that if committed to, the Proponent could address the additional recommendations provided by ECCC in the updated In-Field Water Analysis Monitoring Plan.

ECCC has provided information and advice on a number of potential wildlife issues and has made recommendations accordingly. These include collecting avian species at risk baseline information, identifying potential impacts on avian species at risk and migratory birds and specific mitigation and monitoring measures for species that are known to use quarries and borrow sources as nesting sites. ECCC has discussed the Project footprint in the Northwest Territories (NT1) range for Boreal Caribou and recommends additional mitigation measures to address residual impacts.

### **3.0 Environment and Climate Change Canada’s Mandate, Roles, and Responsibilities**

The mandate of ECCC is determined by the statutes and regulations under the responsibility of the Minister of Environment and Climate Change. In delivering this mandate, ECCC is responsible for the development and implementation of policies, guidelines, codes of practice, inter-jurisdictional and international agreements, and related programs. ECCC’s specialist advice is provided in the context of the *Canadian Environmental Protection Act* (CEPA), the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act* (MBCA), and the *Species at Risk Act* (SARA).

The following information provides an overview of the legislative, policy or other directives under the responsibility of ECCC that relate to the Project, or the EA. The summaries have been prepared for ease of reference and convenience, but for purposes of accuracy, interpretation and application of the legislation, regulation or policy, original documents including any subsequent amendments should be consulted.

#### **3.1 *Canadian Environmental Protection Act, 1999*** (<http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=26A03BFA-1>)

CEPA provides the Government of Canada with tools to protect the environment and human health and establishes strict deadlines for controlling certain toxic substances. A key aspect of CEPA is the prevention and management of risks posed by toxic and other harmful substances. Substances that are declared “toxic” under CEPA are added to the List of Toxic Substances in Schedule 1 of the Act. CEPA regulates many of the substances that have a deleterious effect on the environment.

#### **3.2 *Fisheries Act – Pollution Prevention Provisions*** (<http://laws-lois.justice.gc.ca/eng/acts/f-14/>)

Efforts taken under CEPA are complemented by actions taken under other federal Acts administered by the Minister of the Environment. ECCC’s mandate for water quality stems from the pollution prevention provisions of the *Fisheries Act* (including section 36), which are administered and enforced by ECCC. The Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act* states that compliance with the federal *Fisheries Act* is mandatory. Subsection 36(3) of the *Fisheries Act* specifies that, unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. Proponents should note that only a federal regulation under the *Fisheries Act* or another Act of Parliament can authorize a discharge of a deleterious substance; no federal permit, provincial, territorial or municipal regulatory permit or approval allows for exemption from the *Fisheries Act*.

In the application of the *Fisheries Act*, court cases have accepted that a discharge or effluent that is acutely lethal to fish is deleterious. In other words, results of tests designed to determine whether fish will die in an effluent or discharge within a specified time period will determine one aspect of deleteriousness. However, any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat is also deleterious. For example, substances (such as sediment) that smother nesting areas or spawning grounds, or interfere with reproduction, feeding or respiration of fish at any point in their life cycle are also considered deleterious. In general, any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat may be considered deleterious. Heated discharges are also considered deleterious since the definition of deleterious (*Fisheries Act* section 34) also includes water that has been so changed by heat that it can be deleterious to fish and fish habitat.

The act of depositing a deleterious substance should be considered a violation of the *Fisheries Act*, regardless of whether the water itself is made deleterious by the deposit. Subsection 36(3) of the *Fisheries Act* makes no allowance for a mixing or dilution zone. Any measurements or tests to determine whether something is deleterious should be done where the substance is at its highest concentration, typically at the point of discharge to the receiving water.

### 3.3 *Migratory Bird Convention Act, 1994* (<http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>)

The purpose of the MBCA is to implement the Migratory Birds Convention between Canada and the United States by protecting and conserving migratory birds, as populations and individuals. Within this context, it is the responsibility of the Government of Canada to protect and conserve the roughly 500 species of migratory birds regularly occurring in Canada. ECCC provides the list of bird species protected under the MBCA, which derives from Article I of the Migratory Birds Convention. This list includes all seabirds (except cormorants, pelicans), all waterfowl, all shorebirds and most landbirds (birds with principally terrestrial life cycles).

Section 5.1 of the MBCA prohibits the deposit of a substance that is harmful to migratory birds in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area. This Act also prohibits the possession of a migratory bird, nest or egg without lawful excuse. The *Migratory Birds Regulations* (MBR) provide for the conservation of migratory birds and for the protection of individuals, their nests and eggs. A prohibition against hunting is set out in section 5 of the MBR. The term 'hunt' is given a specific definition in section 2 of the MBR and includes attempting in any manner to kill, injure or harass migratory birds. A prohibition against the disturbance, destruction, or taking of a nest, egg or nest shelter of a migratory bird is set out in subsection 6(a) of the MBR.



Migratory birds, the nests of migratory birds and/or their eggs can be inadvertently harmed or disturbed as a result of many activities, including but not limited to clearing trees and other vegetation, draining or flooding land, or using fishing gear; this is known as incidental take. This inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs is prohibited under the MBCA. Incidental take, in addition to harming individual birds, nests or eggs, can have long-term consequences for migratory bird populations in Canada, especially through the cumulative effects of many different incidents. For further details, please refer to the Avoidance of Detrimental Effects to Migratory Birds website at: <http://ec.gc.ca/paom-itmb/default.asp?lang=En&n=C51C415F-1>.

### 3.4 *Species at Risk Act*

(<https://www.registrep-sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>)

Provisions of SARA refer specifically to the EA of projects. Section 79 of SARA requires that the federal authorities responsible for the EA notify the competent minister(s) in writing if a project is likely to affect a listed wildlife species or its critical habitat and to identify the adverse effects of the project. If the project is carried out, that authority must also “ensure that measures are taken to avoid or lessen those effects and to monitor them.” The measures taken must be consistent with any applicable recovery strategy or action plan under SARA. Accordingly, the results of this EA inform MVEIRB as the Responsible Authority in the context of fulfilling the obligations of section 79 of SARA.

Endangered and threatened migratory bird species at risk (species, subspecies, and distinct populations) have federal legislative protection under the SARA. The purpose of SARA is to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are Extirpated, Endangered or Threatened as a result of human activity and to manage species of Special Concern to prevent them from becoming Endangered or Threatened. SARA supports the federal commitments under the 1996 Accord for the Protection of Species at Risk, which outlines commitments by federal, provincial and territorial ministers to designate species at risk, protect their habitats and develop recovery plans as well as complementary legislation, regulations, policies and programs, including stewardship.

ECCC has responsibilities for overall administration of SARA (subsection 8[1]). As well, SARA defines “competent ministers” as the Minister responsible for the Parks Canada Agency (with respect to individuals of a wildlife species in or on federal lands administered by that Agency); the Minister of Fisheries and Oceans (with respect to aquatic species other than individuals on lands administered by the Parks Canada Agency); and the Minister of ECCC (with respect to all other individuals of a wildlife species). Competent ministers have responsibilities regarding recovery planning, protection, permitting, and other activities identified within the legislation.

SARA sets out a process for an independent assessment of species potentially at risk and for their consideration by Governor in Council for listing on Schedule 1 of SARA as Extirpated, Endangered, Threatened, or of Special Concern. These assessments fall within the purview of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; [http://www.cosewic.gc.ca/eng/sct5/index\\_e.cfm](http://www.cosewic.gc.ca/eng/sct5/index_e.cfm)). SARA requires that recovery strategies and action plans be developed by the competent minister for species listed as Extirpated, Endangered or Threatened. Management plans must be developed for species of special concern.

SARA also provides measures for the protection of listed threatened, endangered or extirpated species and their residences. Under section 32 and 33 of SARA, individuals and residences of aquatic species and birds protected by the MBCA are automatically protected anywhere they are found in Canada. These general prohibitions apply to all other Extirpated, Endangered or Threatened species listed on Schedule 1 of SARA when they are on federal lands in the provinces and on land under the authority of the Minister of ECCC or of the Parks Canada Agency in the territories. These prohibitions can also apply on non-federal (provincial, territorial and private) lands if the Governor in Council makes an order to that effect, based on a recommendation from the federal Minister of ECCC (SARA sections 34 and 35).

Based on the best available information, SARA requires an identification of critical habitat for Threatened, Endangered, and Extirpated species to the extent possible in a recovery strategy or action plan. SARA defines the critical habitat of a species as “*the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or an action plan for the species.*” Once critical habitat is identified in a final recovery strategy or action plan, SARA sets out a process to evaluate existing protection mechanisms, and if necessary, to put in place additional protection under SARA. The timelines and instruments, which can be used to achieve critical habitat protection vary depending on land ownership and the species involved. SARA is designed to turn first to existing laws and initiatives before contemplating using SARA prohibitions directly, looking to federal laws when critical habitat occurs on federal land and to laws of the province or territory or Acts of Parliament including SARA when critical habitat occurs on non-federal lands.

## **4.0 Environment and Climate Change Canada's Technical Review Comments and Recommendations**

### **4.1 Aquatic Environment**

#### **4.1.1 Acid Rock Drainage and Metal Leaching**

##### References:

- Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Environmental Quality Guidelines. Available at: <http://ceqg-rcqe.ccme.ca/en/index.html#void>.
- Commitments from the Technical Session – September 1, 2017 (PR#171).
- Price, W.A. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials. MEND Report 1.20.1.

##### Proponent's Conclusion:

The Proponent stated during the Technical Sessions on August 16, 2017 that borrow sources characterized with high or moderate identification of acid rock drainage or metal leaching potential will be avoided as sources for construction (PR#171).

##### Environment and Climate Change Canada's Conclusion:

Borrow source locations that have been characterized with high or moderate acid rock drainage or metal leaching potential should not be used as sources for construction. Once a source or rock with potential acid rock drainage and/or metal leaching has been exposed it becomes more difficult to mitigate or to ensure that it will not create adverse water quality issues that would pose a risk when the source is in proximity to a body of water frequented by fish.

ECCC further notes that metal leaching can also occur in neutral pH conditions. Acid-base testing and metal leaching testing should be undertaken under the guidance of a qualified professional geochemist. Results from these tests would provide insight on the potential effects to water quality. ECCC notes that the Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials (Price, 2009) is a reputable resource for evaluating acid rock drainage and metal leaching potential in rock. Effects on water quality should be assessed using the results from all testing in comparison to baseline data and considering accepted protective standards, such as the Canadian Council Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQGPAL).

##### Environment and Climate Change Canada'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.

## 4.1.2 Erosion and Sediment Control

### References:

- Commitments from the Technical Session – September 1, 2017 (PR#171).
- Developer's Response to Environment and Climate Change Canada's Information Requests 1, 2, 3, 4, 7, 11 and 12. June 29, 2017 (PR#128).
- ECCC #6 – Erosion and Sediment Control Plans. Government of the Northwest Territories, Department of Transportation – Tłı̨chǫ All-season Road – Type A Land Use Permit and Type B Water Licence Application (W2016E0004 &W2016L8-0001, WLWB ORS) Available at:  
[http://lwbors.yk.com/LWB\\_IMS/ReviewComment.aspx?appid=10878](http://lwbors.yk.com/LWB_IMS/ReviewComment.aspx?appid=10878).
- Project Description Report, Appendix W – Department of Transportation Erosion and Sediment Control Manual January 2013 (PR#7).

### Proponent's Conclusion:

In the July 6, 2016 response to ECCC#6 on the Wek'èezhii Land and Water Board Online Review System, the Proponent stated that it will be using the Government of the Northwest Territories, Department of Transportation, Erosion and Sediment Control Manual as guidance in the development of an ESC Plan, which will include requirements for monitoring, reporting and adaptive management. The ESC Plan will be finalized by the contractor, and the Proponent will ensure the contractor is fully aware and capable of addressing the ESC Plan requirements while the Proponent provides oversight and remains accountable. In the June 29, 2017 response to ECCC IR#1 (PR#128), the Proponent responded to ECCC's request for a draft ESC Plan to be provided during the EA process by stating that the ESC Plan cannot be developed or finalized until the overall procurement process for the Project has been completed. Procurement is not expected to be completed until after the EA process is complete. Should the Project proceed, the Proponent stated that the ESC Plan would be available for review during the regulatory phase of the environmental review process and once final road designs are available. During the Technical Sessions on August 16, 2017 the Proponent committed to providing a draft ESC Plan, response measures for potential thermal erosion events, and relevant lessons learned from other northern projects (e.g., Inuvik to Tuktoyaktuk Highway) with respect to erosion and sediment control, with the Water Licence Application for approval (PR#171).

### Environment and Climate Change Canada's Conclusion:

An ESC Plan has not yet been provided for the Project. This type of plan is essential to guide the Project-specific application/implementation of the Proponent's Erosion and Sediment Control Manual (Appendix W, Project Description Report, PR#7). ECCC notes that although the ESC Plan would be relevant to assessing potential impacts during the EA, it could also be reviewed during the regulatory phase if provided upfront with the Water Licence Application (as committed to by the Proponent, PR#171).

ECCC is concerned with thermal erosion as the Project is in the area of discontinuous permafrost. The ability to respond to thaw and/or erosion events and identification of monitoring and response measures for thermal erosion should be included in the ESC Plan. Response measures should include reporting as well as maintaining the appropriate materials and equipment for stabilization if needed. Lessons learned from other northern road projects with respect to sedimentation and erosion control should also be included in the ESC Plan. Similar to the ESC Plan, ECCC notes that although the response measures and lessons learned from other northern projects would be relevant to assessing potential impacts during the EA, these could be reviewed during the regulatory phase if provided upfront with the Water Licence Application (as committed to by the Proponent, PR#171).

Environment and Climate Change Canada'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.

### **4.1.3 In-Field Water Analysis Monitoring Plan**

References:

- Commitments from the Technical Session – September 1, 2017 (PR#171).
- Developer's Response to Environment and Climate Change Canada's Information Requests 1, 2, 3, 4, 7, 11 and 12. June 29, 2017 (PR#128).
- ECCC #1 – Monitoring Plan. Government of the Northwest Territories, Department of Transportation – Tłı̄chǫ All-season Road – Type A Land Use Permit and Type B Water Licence Application (W2016E0004 & W2016L8-0001, Wek'èezhii Land and Water Board Online Review System [WLWB ORS]) Available at: [http://lwbors.yk.com/LWB\\_IMS/ReviewComment.aspx?appid=10878](http://lwbors.yk.com/LWB_IMS/ReviewComment.aspx?appid=10878).

Proponent's Conclusion:

As stated in the Proponent's July 6, 2016 response to ECCC #1 on the Wek'èezhii Land and Water Board Online Review System, the In-Field Water Analysis Monitoring Plan will provide a monitoring plan for erosion and sediment controls as well as for water quality. This Plan will be updated to include grab samples to measure Total Suspended Solids (TSS) at selected sites and time periods over the course of construction. In the June 29, 2017 response to ECCC IR#2 (PR#128), the Proponent stated that it is not possible to provide a finalized In-Field Water Analysis Monitoring Plan at this point and it will only be available for review during the regulatory phase prior to construction. During the Technical Sessions on August 16, 2017 the Proponent committed to providing an updated In-Field Water Analysis Monitoring Plan with further details on monitoring frequency and duration with the Water Licence Application for approval (PR#171).

In the June 29, 2017 response to ECCC IR#2 (PR#128), the Proponent stated that the Project is not expected to cause significant changes to the aquatic environment and therefore, the Proponent has not committed to any long term monitoring.

Environment and Climate Change Canada's Conclusion:

ECCC notes that although an updated draft In-Field Water Analysis Monitoring Plan would be relevant to assessing potential impacts during the EA, it could also be reviewed during the regulatory phase if it is provided upfront with the Water Licence Application, as committed to by the Proponent (PR#171). Essential elements that should be included in the updated In-Field Water Analysis Monitoring Plan include descriptions of monitoring for water quality and erosion and sedimentation, study design, frequency/duration, sampling locations and parameters, thresholds for action (triggers), action responses (adaptive management), and quality assurance and quality control.

ECCC has concerns regarding monitoring of Project effects on the aquatic environment. Monitoring should be completed until results demonstrate that there will be no erosion and/or water quality issues to confirm the prediction that the Project will not cause changes to the aquatic environment. This monitoring should also be included in the updated In-Field Water Analysis Monitoring Plan that the Proponent has committed to providing during the Water Licence process.

Environment and Climate Change Canada's Recommendations:

- 4.1.3-1 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.
- 4.1.3-2 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.

## 4.2 Terrestrial Environment

### 4.2.1 Avian Species at Risk – Impact Assessment

#### References:

- Consideration of Environment and Climate Change Canada Bird Data for the Environmental Assessment of the Tłı̨chǝ All-Season Road. Golder Associates on behalf of the Government of the Northwest Territories, Department of Infrastructure. Technical Memorandum, September 8, 2017 (PR#176).
- Comment and Response Table for Draft Terms of Reference and Draft Adequacy Statement, Review Comment Table. GoC-ECCC-7 Topic: Baseline Information Requirements Reference: Draft Terms of Reference (PR#76).
- Compiled Online Review System First Round of Information Requests and Responses, Review Comment Table. GoC-ECCC-IR-#9: Avian Species at Risk – Suitable Habitat (PR#169).
- Developer’s Adequacy Statement Response (PR#110).
- Developer’s Response to ECCC Information Requests 6, 8 and 9 (PR#140).
- Ecosystem Classification Group, 2007 (rev. 2009). Ecological Regions of the Northwest Territories – Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. viii + 173 pp. + folded insert map.
- June 9, 2017 Meeting Report, Government of the Northwest Territories and ECCC – ECCC IR#9, Avian Species at Risk Suitable Habitat Analyses Adequacy Statement Response (PR#132).
- Mackenzie Valley Environmental Impact Review Board (MVEIRB) EA 1617-01 Adequacy Statement. Outstanding Information Needs to Satisfy the Terms of Reference, Tłı̨chǝ All-Season Road, Government of the Northwest Territories, Department of Transportation. October 28, 2016 (PR#70).
- Recovery Strategy for the Olive-sided Flycatcher (*Contopus cooperi*) in Canada. *Species at Risk Act*, Recovery Strategy Series (PR#41).
- Recovery Strategy for the Common Nighthawk (*Chordeiles minor*) in Canada. *Species at Risk Act*, Recovery Strategy Series (PR#39).
- Tłı̨chǝ All Season Road Project, EA1617-01 Technical Session Presentation, August 15-17, 2017, Bechokǝ (PR#161, Slide 10).
- Technical Session Transcript for Day 1. August 15, 2017, Bechokǝ (PR#158, pg. 45 and 46).

Proponent's Conclusion:

The Proponent used Landsat SPOT 4/5 imagery data to establish habitat suitability indices for wildlife Valued Components (VCs). Based on habitat associations obtained from scientific literature for avian species at risk VCs, each of the land cover classes was assigned to one of two categories, either moderate to high suitability or low to nil suitability. This analysis was used to conclude that the Project will not lead to significant environmental impacts to avian species at risk VCs (PR#110).

The Proponent met with ECCC on June 9, 2017 to discuss ECCC IR#9 regarding available migratory bird monitoring data to inform the effects assessment (PR#132). ECCC committed to providing the Proponent with point count survey data from acoustic recordings obtained in 2015 and 2016 from ECCC's monitoring program along Highway 3. The Proponent committed to assess the data provided by ECCC and either update their effects assessment with the data or provide an explanation as to why the data would not be included (PR#132). The Proponent has stated that the Fortune Minerals Ltd. NICO Project migratory bird data is not relevant to the Project as the majority of data was collected in the Taiga Shield Ecozone (PR#132). The Proponent later added that of the 44 point counts conducted in the Taiga Plains Ecozone portion of the Fortune Minerals Ltd. NICO Project area, none of the avian species at risk VCs were detected (PR#140).

At the Technical Session in Bechokò, the Proponent committed to complete an analysis of the avian species at risk VCs using the migratory bird data provided by ECCC on June 30, 2017 in their technical session presentation (PR#158, PR#161). However, the Proponent provided MVEIRB with a technical memorandum on September 8, 2017, which detailed why they would not be using the ECCC data as a surrogate dataset to reassess Project impacts (PR#176). In the technical memorandum, the Proponent concluded that the data provided by ECCC did not lend itself to verifying the avian species at risk VC habitat suitability indices included in the Adequacy Statement Response and that their consideration would not change the conclusions regarding impacts to avian species at risk. The technical memorandum further stated that an EA can be completed in the absence of baseline data and still provide confidence in assessment conclusions by applying conservatism so that effects have not been underestimated (PR#176).

Environment and Climate Change Canada's Conclusion:

ECCC is concerned that avian species at risk could be impacted by the Project through habitat loss, habitat alteration, habitat fragmentation, disturbance, and mortality. Subsection 79(2) of SARA states that during an assessment of a project the Responsible Authority must identify the adverse effects of the project on listed wildlife species and their critical habitat, ensure that measures are taken to avoid or lessen those effects, and that the effects need to be monitored.



The suitable habitat indices established by the Proponent and provided in the Adequacy Statement Response do not provide ECCC with sufficient confidence in the Proponent's assessment conclusions regarding impacts to avian species at risk (see ECCC IR#9, PR#169). Habitat suitability indices based on literature and expert opinion can be less reliable than those from analyses using empirical data. This is especially true in instances where there is important knowledge gaps related to the distribution and habitat associations for breeding birds, as there is in northern boreal ecosystems. In the Northwest Territories, many bird species are at the northern extent of their breeding range, few studies have been conducted over this large area and even fewer studies were designed to maximize detection of all bird species. Traditional point count surveys are conducted three to five hours after sunrise when most bird species are active; yet do not overlap periods of increased activity for other important avian species at risk (e.g., sunset for Common Nighthawk, and night for Yellow Rail). As a result, it is not uncommon for the northern boundary of a species' range to change as new or more accurate information is obtained.

In the absence of baseline data, ECCC suggested that surrogate data sources at appropriate spatial and temporal scales could be useful to inform the assessment of avian species at risk. ECCC noted the availability and potential value of including surrogate data sources in the Project assessment early in the EA process as part of the ECCC draft Terms of Reference and draft Adequacy Statement comments (PR#76). Analysis of existing datasets from ECCC and the Fortune Minerals Ltd. NICO Project was suggested to inform and refine the impact assessment following a review of the Adequacy Statement Response (PR#169). These recommendations from ECCC were consistent with MVEIRB's determination that additional information was required regarding the habitat ranges of wildlife and species at risk and the likelihood of their presence in the immediate vicinity of the Project area (PR#70).

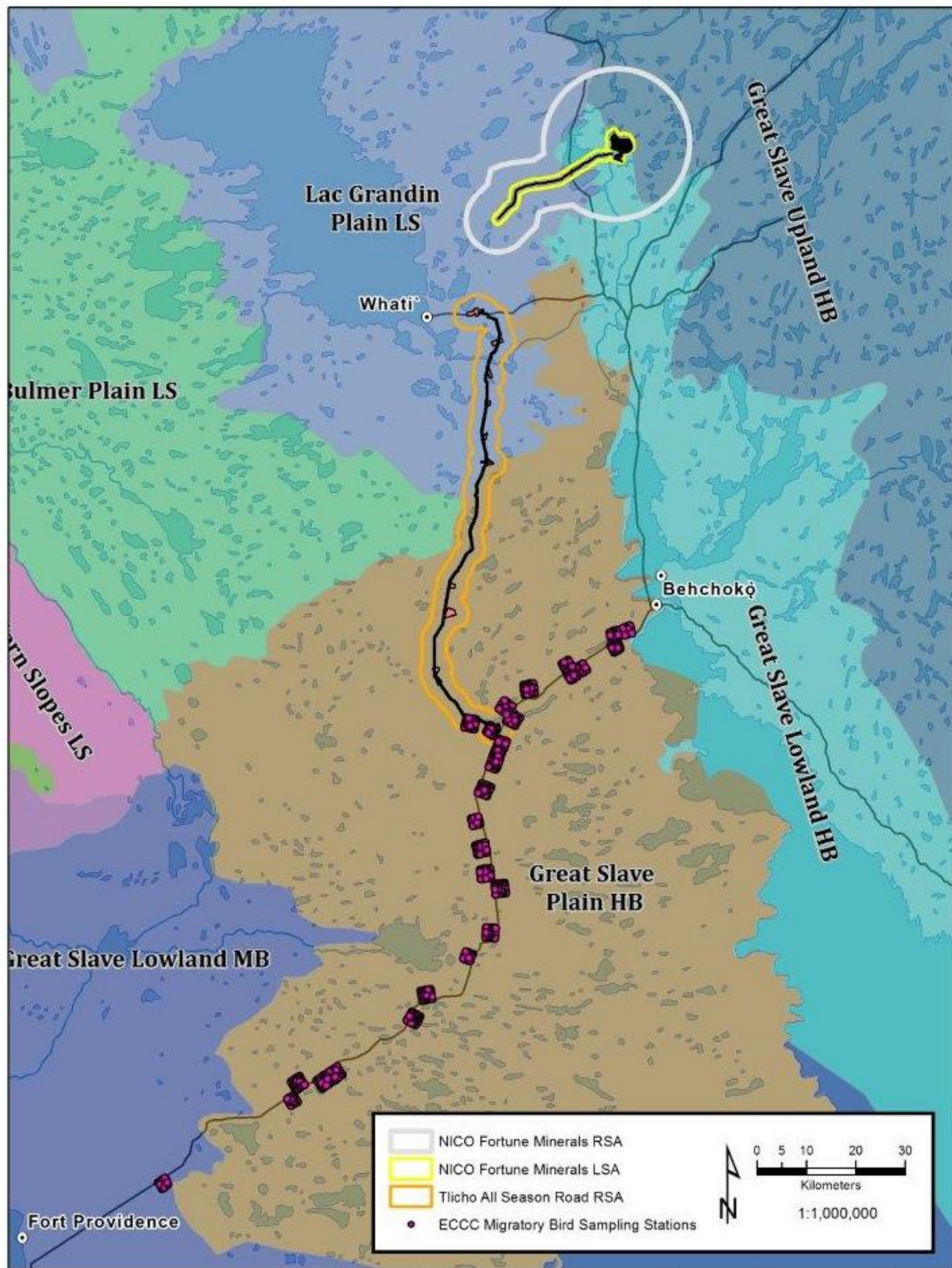
ECCC provided the Proponent with a dataset containing survey results from an ECCC monitoring program that intersects with a portion of the Project Regional Study Area (RSA) to refine the impact assessment. The ECCC study area was located along Highway 3 between Behchokǫ and Fort Providence (Figure 1). Three minute point counts surveys from 362 sampling locations in June 2015 and 439 sampling locations in June 2016 were conducted using autonomous recording units. Data were analyzed using standard protocols providing a community level assessment of migratory birds in the area after sunrise (i.e., abundance data).

The number of land cover types covered by the sampling locations in the ECCC study was raised as a concern by the Proponent. ECCC notes that land cover information should be intersected at a scale reflecting differences in sound attenuation among land cover types (e.g. open versus closed canopies), which influences the area over which birds are detected. It is unclear in the Proponent's consideration of the ECCC data how the land cover information used by the Proponent was intersected with the ECCC autonomous recording unit sampling locations (i.e., at the point-level or spatial units quantifying land cover types within a sampling radius of each sampling location). ECCC agrees that the Proponent might not be able to generate strong inferences for each and every land cover type as the sampling design was not set up to achieve this goal. Nonetheless, the ECCC dataset could provide useful information for a subset of land cover types, including burnt areas.

The Proponent questioned whether the spatial scale of inference was valid for sampling locations outside the Project's RSA. ECCC notes that Level IV ecoregions, delineated based on regional differences in climate, physiography, vegetation, soil, water, and fauna (Ecosystem Classification Group, 2007 [rev. 2009]), are an appropriate scale of inference for avian point count surveys with considerable replication such as the ECCC data. Only considering sampling locations within a relatively small RSA would prevent the use of rare high quality data collected in similar nearby northern ecosystems that are less than 100 km away. ECCC data were collected almost entirely within the Great Slave Plain High Boreal ecoregion, which also encompasses approximately 59% of the RSA (Figure 1). For this reason, ECCC recommended that data collected by the Fortune Minerals Ltd. NICO Project at 44 sampling locations within the Lac Grandin Plain Low Subarctic ecoregion also be included as a surrogate dataset to quantify habitat associations for the Project (Figure 1). However, the Proponent determined that no avian species at risk were detected at these sampling locations indicating gaps in information related to presence, abundance and habitat associations for avian species at risk in 41% of the RSA.

The Proponent considered the clustered distribution of the ECCC sampling locations to be problematic. ECCC notes that routine statistical procedures are now available to account for non-independence among sampling units from a given study. The potential negative effects of double counting or reporting information from sampling locations spatially clustered can be accounted by adding random effects (i.e., random intercept or slope) in models. As the Proponent stated (PR#176), there are "*only six unburned sites*" (or clusters); however, the monitoring program contained a relative large sample size within unburnt habitat (n = 86). However, ECCC is of the opinion that the ECCC data is well suited to generate models from which inferences can be made throughout the Great Slave Plain High Boreal ecoregion because the number of sampling locations can be considered large enough and that the distribution of the sites (or clusters) is based on a stratified-random sampling design along Highway 3. The ECCC data is particularly well suited to generate strong inferences about bird association with burnt habitats, which represents approximately 66% of the RSA within this ecoregion. The Proponent's supporting example of detection of Common Nighthawk in low suitability habitat only highlights the need to understand habitat selection at multiple spatial scales, (i.e., importance of landscape context and habitat edges). This was discussed in ECCC IR#9 (PR#169) and concerns were raised in the identification of critical habitat for avian species at risk (see recovery strategies for Common Nighthawk [PR#39] and Olive-sided Flycatcher [PR#41]).

In summary, the Proponent has highlighted that the Fortune Minerals Ltd. NICO Project data does not contain avian species at risk detections and therefore cannot be used as a surrogate data source to refine the impact predictions. The Proponent has also highlighted concerns with using the ECCC dataset as a surrogate dataset. ECCC advises that, in the absence of using surrogate datasets, the alternate approach to improve certainty in the avian species at risk assessment is to collect baseline data. Baseline data would be instrumental when assessing potential impacts of the Project given the permanent and irreversible nature of impacts of the proposed Project and the knowledge gaps in presence, abundance and habitat associations presented above (and also referred to in recovery strategies). Baseline data could also be used to verify that measures taken to avoid or lessen any potential effects to avian species at risk are effective.



**Figure 1.** TASR Ecoregion Map with Environment and Climate Change Canada's Migratory Bird Sampling Stations

Environment and Climate Change Canada’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.

**4.2.2 Avian Species at Risk – Mitigation and Monitoring at Quarries and Borrow Sources**

References:

- Commitments from the Technical Session – September 1, 2017 (PR#171).
- Developer’s Response to Environment and Climate Change Canada’s Information Requests 1, 2, 3, 4, 7, 11 and 12. June 29, 2017 (PR#128).
- Technical Session Transcript for Day 2. August 16, 2017, Bechokò (PR#159).
- Tłı̨chǫ All-Season Road Updated Draft Wildlife Management and Monitoring Plan (WMMP). September 22, 2017 (PR#192).

Proponent’s Conclusion:

The Proponent stated in the June 29, 2017 response to ECCC IR#11 (PR#128), that effective management of pits and quarries to minimize disturbance and avoid destruction of avian species at risk (Bank Swallow and Common Nighthawk) nests and eggs is a current and ongoing mitigation for all Government of the Northwest Territories highway operations. The same measures will be applied to the Project construction and operation phase and were developed using ECCC guidance. Environmental Monitors will conduct regular inspections and a slope of less than 70% will be maintained on all quarry stockpiles, overburden and exposed soil banks in order to prevent creating suitable nesting habitat for Bank Swallows.

During the Technical Session on August 16, 2017 the Proponent committed to updating the Wildlife Management and Monitoring Plan (WMMP) to include specific mitigation and monitoring for avian species at risk at quarries and borrow pits (PR#171). In the Updated Draft WMMP, the Proponent restated that quarries will be operated in accordance with the ECCC brochure “Bank Swallows in Sandpits and Quarries” during construction and operation of the Project (Appendix F, PR#192). Additionally, Appendix C of the Updated Draft WMMP states that bird nest monitoring and camp surveillance will be completed at specific locations, including Project infrastructure and quarries, at least once per week as part of mitigation monitoring.

Environment and Climate Change Canada's Conclusion:

ECCC is concerned about potential disruptive activities to avian species at risk at quarries and borrow sources. Bank Swallow, Common Nighthawk and other migratory bird species are known to nest on stockpiles, overburden piles and on flat cleared and/or areas that contain gravel. Disturbance at quarries and borrow sources presents higher risks for Bank Swallows and Common Nighthawk (both avian species at risk VCs) related to potential nest abandonment and destruction of nests/eggs.

In ECCC IR#11 (PR#128), ECCC requested specific avian species at risk mitigation measures be identified to minimize disturbance and avoid the destruction of avian species at risk nest and eggs at quarries and borrow sources as the WMMP focused primarily on mitigating effects of land clearing activities. The Proponent's response did include a general description of proposed mitigation and monitoring measures at quarries and borrow sources to address ECCC's concerns. However, details were lacking and the Proponent stated that the WMMP would be finalized during permitting. ECCC made further requests for details at the technical session related to the frequency of monitoring, reporting, and specific mitigation measures the Proponent was committing to before, during and after occupation by avian species at risk at quarries and borrow pits (PR#159). Although further details regarding monitoring aspects were included in the updated draft WMMP, specific details on mitigation measures were not provided. The Proponent references the ECCC brochure "Bank Swallows in Sandpits and Quarries" but no clear indication of how this guidance, or portions of it, would specifically be implemented for this Project is provided.

The monitoring frequency at active sites proposed by the Proponent (i.e., one bird nest monitoring survey per week) may be insufficient to detect nesting if other habitat management measures are not fully adhered to. Adequate prevention and monitoring are necessary at these sites as birds can initiate nests within days at inactive or quiet sites during the nesting season. It is unclear what measures will be taken if birds do nest and how activities at these sites may be managed to minimize impacts. Given the high likelihood of Bank Swallows returning in subsequent years, it is unclear how nesting habitat will be managed once avian species at risk have left and if it will be included as a reclamation objective as to not impact reproductive success in subsequent years. The details are important to determine whether there will be residual impacts to avian species at risk related to the Project.

Environment and Climate Change Canada's Recommendations:

- 4.2.2-1 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.
- 4.2.2-2 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.

- 4.2.2-3 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.
- 4.2.2-4 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.
- 4.2.2-5 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.

#### **4.2.3 Avian Species at Risk and Migratory Birds – Mitigation and Monitoring in the Updated Draft Wildlife Management and Monitoring Plan**

##### Reference:

- Tłı̨chǫ All-Season Road Updated Draft Wildlife Management and Monitoring Plan (WMMP). September 22, 2017 (PR#192).

##### Proponent's Conclusion:

The Updated Draft WMMP (PR#192) states that, to the extent possible, clearing activities are to occur outside the breeding bird nesting season (May to mid-August). Pre-clearing surveys conducted by qualified biologists would precede vegetation clearing activities should they be required during the sensitive nesting period. "No-work zones" will be observed for identified active nests, nests will be protected by a buffer that protects the nest while allowing construction to continue and nests will be monitored weekly. Details of nests identified and the mitigation will be included in the weekly wildlife monitoring reports.

The Proponent will deter birds 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 on infrastructure, the nest will not be disturbed until after the birds have left the area.

The Update Draft WMMP explains how wildlife mortality and the effectiveness of mitigation measures will be reported. Reporting includes notifying interested parties, including ECCC through weekly, annual and comprehensive (i.e., detailed trend analysis following construction and following five years of operational monitoring) reporting. Any wildlife concerns or bird nesting observed during mitigation monitoring will be reported to the Government of the Northwest Territories, Department of Environment and Natural Resources to determine an appropriate course of action.

Environment and Climate Change Canada's Conclusion:

ECCC acknowledges and supports the Proponent's intent to avoid clearing activities during the general nesting period for migratory birds. The nesting periods provided by ECCC are a general guidance to assist Proponents in planning their field activities. It is important to note that breeding periods may vary from year to year due to climatic conditions and some species may nest outside the dates provided if conditions are favourable.

ECCC supports the use of a qualified biologist for pre-clearing surveys. However, few details are provided about these surveys in the Updated Draft WMMP. Information such as the expected frequency of use, types of circumstances and specific survey methods are lacking. In most habitats, the ability to detect active nests remains very low while the risk of disturbing breeding birds and their eggs is high and could lead to incidental take.

The wording used in the Updated Draft WMMP should emphasize that "no-work zones" and "buffers" are established with the primary objective to protect nests by minimizing disturbance in the vicinity. Only after assessing the effectiveness of "no-work zones" or "buffers" should disruptive activities continue. If migratory bird nests containing eggs or young are located or discovered during operations, all disruptive activities in the nesting area should be halted until nesting is completed. Any active nest found should be protected with a buffer zone determined by a setback distance appropriate to the species and taking into consideration the intensity of the disturbance and the surrounding habitat. Buffer zones should be kept in place until the young have naturally and permanently left the vicinity of the nest. If work is proposed in the areas where migratory birds are nesting, options like avoiding, adapting, rescheduling or relocating activities that could disturb or destroy the nests, should be considered.

ECCC is supportive of the Proponent's proposed measure to manage bird nesting on infrastructure, such as the use of placing covers, screens or netting on vents, holes and crevices. However, these mitigation measures should be put in place prior to the arrival of birds in the spring, rather than prior to when the disturbance or maintenance activities are scheduled as specified in Section 2.5.1 of the Updated Draft WMMP (PR#192). This will prevent birds from initiating nesting on infrastructure during the breeding season. Activities such as cleaning, application and removal of protective coatings (e.g., paints) and demolition should not take place during the breeding season on infrastructure where migratory birds are nesting, as there is a risk of disturbing or destroying eggs or nestlings.

ECCC supports the Proponent reporting all wildlife mortality and effectiveness of mitigation measures to inform adaptive management. However, throughout the Updated Draft WMMP, the Proponent has inconsistently indicated when ECCC will be contacted or engaged to discuss concerns regarding avian species at risk and migratory birds. For example, the Updated Draft WMMP specifies that in the event that a bird nest is identified during construction or a wildlife incident occurs it will be reported to the Government of the Northwest Territories, Department of Environment and Natural Resources, but does not specify that ECCC should also be contacted at these times.

Environment and Climate Change Canada's Recommendations:

- 4.2.3-1 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.
- 4.2.3-2 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.
- 4.2.3-3 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.eenordrptno-eanorthpnrnw.ec@canada.ca).
- 4.2.3-4 ECCC recommends that the Proponent incorporate all of the above recommendations into the next revision of the WMMP.

#### **4.2.4 Boreal Caribou – Assessment, Mitigation and Monitoring**

References:

- Boreal Caribou Meeting Summary – Boreal Caribou Impact Mitigations. January 20, 2017 (PR#107).
- Developer's Adequacy Statement Response (PR#110).
- Developer's Response to ECCC Information Requests 5 and 10 (PR#135)
- Developer's Response to ECCC Information Requests 6, 8, and 9 (PR#140)
- Developer's Response to ECCC Information Requests 1, 2, 3, 4, 7, 11, and 12 (PR#128).
- Canadian Zinc Information Request Round 2 Responses – Commitment Table (EA1415-01 – PR#355).  
Available at: [http://reviewboard.ca/upload/project\\_document/EA1415-01\\_CanZinc\\_IR2\\_response\\_attachment\\_-\\_commitments\\_table.PDF](http://reviewboard.ca/upload/project_document/EA1415-01_CanZinc_IR2_response_attachment_-_commitments_table.PDF)
- Commitment 9 - Additional Boreal Caribou Maps and Narrative for Figures Provided in the Government of the Northwest Territories Response to ECCC IR#7 (PR#199).
- Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal population, in Canada (PR#38).
- Tłı̨chǫ All-Season Road Adequacy Statement, Section 4.1 – Boreal Caribou Population Health Meeting Summary. November 10, 2016 (PR#99).



- Tłı̨chǫ All-Season Road Updated Draft Wildlife Management and Monitoring Plan (WMMP). September 22, 2017 (PR#192).

Proponent's Conclusion:

The Proponent predicts that the addition of the Project represents an increase of <0.1% disturbance (1,780 ha) within the Northwest Territories range (NT1) of Boreal Caribou (PR#110). The Proponent concluded that habitat disturbance in the NT1 range is approaching the 65% threshold identified in the national recovery strategy (PR#38). However, the addition of the Project and reasonably foreseeable developments would not lead to exceeding the recovery strategy threshold (PR#110, PR#135).

The Proponent predicts that effects to Boreal Caribou movement from either habitat fragmentation or avoidance of the Project will be localized and not likely measurable at the scale of the NT1 range. The Proponent also provided a quantitative analysis of habitat connectivity with the NT1 range. The results indicated that the small changes to the distribution of undisturbed habitat with the NT1 range were not predicted to adversely affect Boreal Caribou (PR#140).

In the Updated Draft WMMP (PR#192), a number of mitigation and monitoring measures are proposed to address potential impacts of the Project on Boreal Caribou. Mitigations include reduced speed limits, following recognized guidelines for dust suppression, blasting measures, notification and reporting system and awareness training for employees. The Boreal Caribou collaring program will be continued and expanded to inform mitigations and monitor Project effects.

Environment and Climate Change Canada's Conclusion:

The national recovery strategy goal for Boreal Caribou is to achieve self-sustaining local populations in all Boreal Caribou ranges throughout their current distributions in Canada (PR#38). The likelihood of the self-sustaining population is based on two indicators, population trend and disturbance level within a Boreal Caribou range. Recovery is achieved for Boreal Caribou in the Northwest Territories range (NT1) by maintaining population and range conditions that support its current self-sustaining status.

The Government of the Northwest Territories is the government organization with primary management responsibility for Boreal Caribou in the Northwest Territories. The Government of the Northwest Territories is also leading the development of regional range plans for the species; however, a range plan for the North Slave Region has yet to be developed.

ECCC is concerned with undisturbed habitat in the NT1 range approaching thresholds established in the recovery strategy for Boreal Caribou. ECCC's estimate of the new buffered disturbance resulting from the Project's footprint is 4,380 ha, including all proposed borrow sources. Despite this disturbance estimate being higher than the Proponent's, ECCC acknowledges that the contribution of the Project to the overall habitat disturbance within NT1 would not lead to exceeding the recovery strategy threshold.

ECCC met with the Proponent to discuss Boreal Caribou concerns related to the Project on November 10, 2016 and January 20, 2017 (PR#107, PR#99). NT1 habitat disturbance and recovery estimates, lack of baseline information to assess Project effects and information available to update the population trend assessment in the recovery strategy were all discussed. The Proponent initiated a Boreal Caribou collaring program in March 2017 to address knowledge gaps within the North Slave Region. Maps showing the seasonal movements of 20 collared female Boreal Caribou between mid-March and mid-September are presented in the Response to ECCC IR#7 (PR#128) and Commitment 9 from the Technical Session (PR#199).

Although the collaring data represents a small sample size and a short period to date, some useful information about movements and seasonal distribution of Boreal Caribou near the Project is emerging. The potential effects of the Project on Boreal Caribou habitat connectivity has been of concern to ECCC and is directly related to the population and distribution objectives in the recovery strategy. Potentially at risk from the Project is the functional loss of an estimated 142,600 ha patch of undisturbed habitat that lies directly east and extends to the boundary of the range. The calving and early-mid-summer movements of collared caribou confirm use of this patch of undisturbed habitat east of the Project for calving. To date, the Proponent notes four instances of collared Boreal Caribou crossing the proposed Project alignment and no crossings of Highway 3 (PR#199). ECCC supports the need to continue and expand the Boreal Caribou collaring program in the North Slave Region to monitor potential effects of the Project on habitat use and movements.

ECCC supports mitigation measures proposed to date in the Updated Draft WMMP (PR#192). ECCC notes the absence of measures such as installing windrows to discourage predator/harvester access and limit sightlines at intersections with linear features, which was recommended by the Government of the Northwest Territories, Department of Environment and Natural Resources during the EA for the Canadian Zinc Corporation Prairie Creek All-Season Road (EA1415-01 – PR#355). ECCC encourages MVEIRB to verify the adequacy of the proposed measures in the WMMP with other interested parties having shared management responsibilities for Boreal Caribou and actively participated in this EA including the Tłı̨chǫ Government, the Wek'èezhìi Renewable Resources Board and the North Slave Métis Alliance.

Environment and Climate Change Canada's Recommendations:

- 4.2.4-1 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.
- 4.2.4-2 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.

## 5.0 Conclusion

The specifics of ECCC's outstanding issues have been discussed in detail in this technical report and for convenience, ECCC's recommendations have been re-stated below. We trust that the issues brought forward by ECCC will assist MVEIRB in further assessing the potential for significant adverse effects from the Project and recommending mitigation to avoid these potential affects.

ECCC's technical comments and recommendations provided are intended to provide expert advice to decisions-makers, in accordance with its program-related responsibilities and associated guidelines and policies. These comments are in no way to be interpreted as any type of acknowledgement, compliance, permission, approval, authorization, or release of liability related to any requirements to comply with federal or territorial statutes and regulations. Responsibility for achieving regulatory compliance lies solely with the Proponent.

### 5.1 Summary of Environment and Climate Change Canada's Recommendations

#### **Issue 4.1.1: Acid Rock Drainage and Metal Leaching**

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.

#### **Issue 4.1.2: Erosion and Sediment Control**

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.

#### **Issue 4.1.3: In-Field Water Analysis Monitoring Plan**

4.1.3-1 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.

4.1.3-2 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.

**Issue 4.2.1: Avian Species at Risk – Impact Assessment**

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.

**Issue 4.2.2: Avian Species at Risk – Mitigation and Monitoring at Quarries and Borrow Sources**

4.2.2-1 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.

4.2.2-2 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.

4.2.2-3 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.

4.2.2-4 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.

4.2.2-5 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.

**Issue 4.2.3: Avian Species at Risk and Migratory Birds – Mitigation and Monitoring in the Updated Draft Wildlife Management and Monitoring Plan**

4.2.3-1 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.

- 4.2.3-2 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.
- 4.2.3-3 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.eenordrpntno-eanorthpnrnw.t.ec@canada.ca).
- 4.2.3-4 ECCC recommends that the Proponent incorporate all of the above recommendations into the next revision of the WMMP.

**Issue 4.2.4: Boreal Caribou – Assessment, Mitigation and Monitoring**

- 4.2.4-1 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.
- 4.2.4-2 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.