
TO: Brian Aglukark
Nunavut Planning Commission

From: Todd Burlingame
Baffinland Iron Mines Corporation

File: Proposed Plan Amendment
North Baffin Regional Land Use Plan
Amendment #3

Date: November 29, 2017

REFERENCE: SUMMARY OF CARIBOU-RELATED MITIGATION FOR RAIL

Baffinland submits to the Nunavut Planning Commission (NPC), for reference, a listing of caribou protection measures established through the NPC and Nunavut Impact Review Board (NIRB) review processes related to the Mary River Project and Early Revenue Phase project.

INTRODUCTION

A number of documents capture the commitments Baffinland has made with regard to caribou. These documents include mitigation for various project activities and components. A number of documents reference caribou protection measures which have been established and are currently adopted specifically related to mitigation to trucking via the Northern Transportation Corridor.

The information summarized in this memo pertains specifically to mitigation related to rail, as contained in the following source documents:

1. Final Hearing Report. Mary River Project. Baffinland Iron Mines Corporation. NIRB File No. 08MN053. September, 2012. (Baffinland, 2012)
2. Commercial Production Lease of Inuit Owned Lands #Q13C301. Mary River Caribou Protection Measures. January 29, 2014. (QIA and Baffinland, 2014)
3. Mary River Project Final Environmental Impact Statement. Baffinland Iron Mines Corporation. February 2012. (Baffinland, 2012)
4. NIRB Project Certificate No. 005 Conditions. Issued to Baffinland Iron Mines Corporation for development of the. Mary River Project Proposal in the. Qikiqtani Region of Nunavut. May 28, 2014. (NIRB, 2014)
5. Terrestrial Environment Mitigation and Monitoring Plan. Baffinland Iron Mines Corporation. Document: BAF-PH1-830-P16-0027. Issue date, March 14, 2016.
6. Environmental Protection Plan. Issued August 30, 2016.

Reference: Summary of caribou-related mitigation for rail**Final Hearing Report for the Mary River Project (NIRB File No. 08MN053)**

The following commitments related to caribou were identified in the Final Hearing Report:

- Commitment 15 - Baffinland is committed to creating crossings along the railway track which facilitate the passage of caribou.
- Commitment 71 - Baffinland is committed to investigating any mortality to caribou resulting from project activity, and to investing in a precautionary monitoring and adaptive management program to mitigate caribou responses to development activities.
- Commitment 72 - Baffinland is committed to implementing appropriate measures to ensure that all caribou carcasses linked to the project activities are discarded in accordance with applicable regulations and guidelines.
- Commitment 73 - Baffinland is committed to implementing traffic controls along the railway if it is determined that the caribou mortality rate is impacted by the railway.

Commercial Production Lease of Inuit Owned Lands #Q13C301. Mary River Caribou Protection Measures.

What follows are excerpts from the supplemental caribou protection measures ("Mary River CPM") developed by QIA for application to the Mary River Project Area (as defined at section 3.6 of the IIBA). These measures have been developed and agreed upon through collaboration between QIA and Baffinland. These Mary River CPM incorporate significant roles for the Terrestrial Environment Working Group ("TEWG"). In developing these Mary River CPM, QIA and Baffinland have fully considered all provisions of the NBRLUP and in particular those set out in Appendix I, entitled "DIAND Caribou Protection Measures". They were further informed by Baffinland's Final Environmental Impact Statement for the Mary River Project, as well as the Final Environmental Impact Statement ERP Addendum and participation in NPC and NIRB processes related to the ERP proposal. The Mary River CPM will be included as part of the Terrestrial Environment Management and Monitoring Plan ("TEMMP") and further managed by the TEWG.

- Item 6 - Based upon monitoring results, including the application of thresholds, the Permittee may intensify mitigation within the Mary River Project Area during pre-calving, calving and post-calving seasons (15 May to 15 July), including consideration of measures such as modifying or restricting traffic on roads and railway if cow-calf pairs or groups with calves are observed within proximity of the road or railway. A distance of 100 m from roads and railway is selected as the initial basis from which modifications or restrictions shall apply. Thresholds should be subject to modification based upon herd size.
- Item 7 - In the event that any Project Protection Zones are established in accordance with the principles set out at Section 2 above, the following mitigation measures could be considered for application in "high probability" areas:
 - Applying lower slope road and rail bed berms, and lower embankment heights where possible;
 - Design and modify the road and rail bed configuration to maximize sightlines for drivers and avoid blind spots (corners and angle of approach up the berm onto the road/rail surface);
 - Managing snow clearing and height of snow berms so that they do not restrict vision for drivers and caribou to see each other;
 - Design and modify the road (and rail bed) configuration to maximize sightlines for caribou approaching the road and rail bed and avoid blind spots;
 - Ensure that escape routes are conspicuous off the road surface, especially in zones rated as high probability encounter areas;
 - During snow-clearing ensure that snow banks are maintained at less than 1 m (and preferably at less than 0.5 m based on research at the Ekati diamond mine (Rescan, 2011) and are broken into sections with gaps so caribou are not 'trapped' on the road or railway; and
 - Signage for known caribou crossings throughout Project infrastructure.

Reference: Summary of caribou-related mitigation for rail**Mary River Project Final Environmental Impact Statement**

The following mitigation and monitoring commitments were presented in the Final Environmental Impact Statement for the Mary River Project:

- Wildlife monitoring on railway and Tote Road;
- Wildlife monitoring by the HTO;
- Wildlife monitoring by employees;
- Record of collision on railway and Tote Road; and
- Record of all observed wildlife mortality reported by personnel.

Project Certificate No. 005 Conditions

The following conditions related to caribou were deemed appropriate by the NIRB during the project review process:

- Condition No. 53 - The Proponent shall demonstrate consideration for the following:
 - Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads;
 - Specific measures intended to address the reduced effectiveness of visual protocols for the Milne Inlet Tote Road and access roads/trails during times of darkness and low visibility must be included;
 - Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times. The details of these monitoring and mitigation measures shall be developed in conjunction with the TEWG;
 - Evaluation of the effectiveness of proposed caribou crossings over the railway, Tote Road and access roads as well as the appropriate number;
 - Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded; and
 - Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.
- Condition No. 54 - The Proponent shall provide an updated TEMMP which shall include, but not be limited to the following:
 - Details of the methods and rationale for conducting monitoring prior to the commencement of construction;
 - Monitoring for caribou presence and behavior during railway and Tote Road construction;
 - Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife;
 - Details of monitoring and mitigation activities, which should be established in collaboration with the TEWG and are expected to include:
 - Dustfall (fugitive and total suspended particulates), that addresses methods to reduce risk to caribou forage from dustfall;
 - Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway and Tote Road. Using the result of this information, an early warning system for caribou on the railway and Tote Road shall be developed for operation;
 - Details of monitoring thresholds related to level of mitigation and management; and

Reference: Summary of caribou-related mitigation for rail

- Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effects on caribou behaviour resulting from increased human access caused by upgrades to the Tote Road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.
- Condition No. 58 - Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:
 - An examination for trends in the measured natural variability of valued ecosystem components in the region relative to the baseline reporting;
 - A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway, the Tote Road and associated access roads/trails;
 - A description of the extent of dustfall based on measured levels of dustfall (fugitive and finer particles such as total suspended particulate) on lichens and blueberries, and ash content of caribou fecal pellets;
 - A demonstration and description of how the monitoring results, including the railway, road traffic, air traffic and dustfall contribute to cumulative effects of the project;
 - Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program; and
 - Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the QIA and affected communities, and shall be circulated as new information becomes available.
- Condition No. 60 - Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected; and
- Condition No. 171 - The Proponent shall include within its updated TWMMMP, a commitment to establish deterrents along the railway and Tote Road embankments at any areas where it is determined that caribou are utilizing the embankments or transportation corridors to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.

Terrestrial Environment Mitigation and Monitoring Plan

- Project activities will be planned and conducted to minimize the project footprint to the extent possible, thus minimizing the direct loss of habitat or the reduction of habitat effectiveness (indirect habitat loss);
- Sensory disturbances will be limited where possible throughout the year. This will be realized by developing a blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou and other wildlife may be negatively affected;
- Active caribou calving sites (as identified by Project biologists or observed by aircraft pilots) will be avoided between May 15 and July 15, and where possible, there will be no increase in mine construction or operational activity within 3 km of the calving sites during this time period;
- If any females (one or more) are observed within 3 km of a planned project activity such as drilling or road construction from May 15 through to July 15, then the activity location will either be moved or the activity deferred as appropriate and if possible, until a later date when caribou are not present;
- Should a female caribou or a female with calves approach within 3 km of project activities (between 15 May and 15 July), the animals will be observed on the ground. If it is obvious they are being disturbed, the activity will cease until they have moved at least 3 km away;
- If caribou approach a project activity site before work commences, the Environment Department shall be notified immediately and will determine the necessary measures that need to be taken to protect caribou activity;
- If caribou approach a project site while work is in progress, caribou will be observed for signs of disturbance;

Reference: Summary of caribou-related mitigation for rail

- If the caribou are disturbed, the activity will be modified or cease until the caribou have moved away or they are guided away from the worksite;
- Monitoring and mitigation measures will be implemented at points where the railway, roads, trails or flight paths pass through caribou calving areas, particularly during caribou calving times;
- Protocols will be implemented for documentation and reporting of all caribou collisions and mortalities as well as mechanisms for adaptive management responses designed to prevent further interactions;
- If caribou approach a project activity site before work commences, the animals will be observed on the ground and if it is obvious that they are being disturbed, work will not commence until they have moved on. If caribou approach a project site while work is in progress, caribou will be observed for signs of disturbance. If the caribou are disturbed, the activity will be modified or cease until the caribou have moved away or they are guided away from the worksite;
- Snow management activities will, either cumulatively through the season or within a reasonable period of a weather event, maintain a snow bank height less than 1 m along the railway and Tote Road with smooth top edges. This will permit caribou to cross the transportation corridor without being blocked by steep snow banks. In addition to reducing the barrier effect, this snow management practice will also likely reduce drifting snow;
- Identified trail crossings along the railway and the Tote Road where the physical structure might result in a barrier to caribou movement will be constructed of finer fill material to replicate natural trail conditions, preventing leg entrapment, and gentler gradients to reduce the visual barrier of the embankments. Any additional (*i.e.*, new) trail crossings identified during construction or operation will also be modified with gentler slopes and finer fill if caribou deflections are detected;
- An on-site review of caribou trail crossings will be conducted and adjustments implemented to the structure of embankments with QIA-identified elders and hunters;
- Wildlife signage will be posted at trail crossings along the Tote Road. Railway operators will be made aware of the crossing areas along the railway;
- A large railway bridge will be constructed at the Cockburn Lake caribou water crossing; the bridge will be tall enough (10 magl) to allow caribou to pass underneath;
- Consistent trainset passes will be employed along the railway to which caribou are expected to adapt;
- Surveillance system along the railway corridor will be used to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded;
- Based on IQ knowledge provided by hunters and elders, if migratory caribou start to move through the RSA again, then the leading caribou will be allowed to cross over the Tote Road and railway undisturbed so that others will follow;
- Railway operators will be required to report any caribou sighting along the railway;
- In terms of Project management, the threshold for caribou mortality is zero — that is, any project-related caribou mortality will trigger an investigation into the cause of the accident and potential contributing factors (direct and/or indirect). Depending on the outcome of the investigation, additional mitigation actions may be implemented to prevent future mortality. If caribou mortality increases due to Project activities, the effects can be readily mitigated by increasing traffic controls including seasonal traffic limitations of both the Tote Road and rail. Timing and duration of limitations will be determined by repeated on-site observations of caribou behaviour along the transportation corridors as the Project proceeds through construction and operation;
- Wildlife right-of-way policy on Project roads and railway;
- Reporting and documentation of all mortalities and near misses is mandatory, and follow-up investigations will be conducted for all mortality events;
- When caribou are observed on roads or railway, a “caribou advisory” will be issued through the site radio network to alert operators and drivers that caribou are in the area and to maintain extra vigilance while driving or operating the railway in accordance with Baffinland’s Caribou Decision Tree;

Reference: Summary of caribou-related mitigation for rail

- Any carcasses will be promptly removed from transportation corridors to discourage further collisions (*e.g.*, scavengers on railway);
- Whenever practical and not causing a human safety issue, a stop work order will be used when wildlife in the area may become endangered (*i.e.*, risk of physical injury or death) by the work being undertaken; and
- The train is expected to operate 300 days per year, so seasonal stoppages are possible if large groups of migratory caribou move through the area.

Environmental Protection Plan

- The mitigation presented in the Environmental Protection Plan is captured within the TEEMP.