July 11, 2023

Cory Barker
Technical Advisor III
Nunavut Impact Review Board
P.O Box 1360
Cambridge Bay, NU   X0B 0C0

Sent VIA Email: info@nirb.ca

RE: NIRB File No: 08MN053 Comment request for Baffinland Iron Mines Corporation's Mary River Project 2022 Annual Report

Dear Cory Barker,

The Government of Nunavut (GN) would like to thank the Nunavut Impact Review Board (NIRB) for the opportunity to review and comment on the 2022 Annual Report for Baffinland Iron Mines Corporation's Mary River Project.

The GN has reviewed the Mary River Project 2022 Annual Report and provides comments below (see Appendix A). Should you have any questions, please do not hesitate to contact me by email at dlapierre1@gov.nu.ca.

Qujannamiik,

Dianne Lapierre
Avatiliriniq Coordinator

On behalf of
David Kunuk, Deputy Minister
Economic Development and Transportation
Government of Nunavut

Appendix A:

Government of Nunavut Comments on the Mary River Project 2022 Annual Report

P.O. Box 1000 Stn.1500
Iqaluit, Nunavut X0A 0H0

C.P. 1000 Succursale 1500
Iqaluit, Nunavut X0A 0H0

(867) 975-7828
(867) 975-7870
www.gov.nu.ca

GN AR # 01	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Helicopter Traffic
Terms and Conditions	NIRB PC (amendment 3) terms and conditions # 59, 71, 72
References	• Baffinland Iron Mines Corporation (BIMC). (2016). Terrestrial Environment Mitigation and Monitoring Plan. • Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2021 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2023). Mary River Project Terrestrial Environment 2021 Annual Monitoring Report. • Government of Nunavut (GN). (2019a). Comments on Baffinland Iron Mines 2018 Annual Report to the Nunavut Impact Review Board. • Wolfe *et al*. (2000). *Polar Research* 19: 63-13. • Wilson and Wilmhurst (2019) *Rangifer*, 39: 27-42. DOI 10.7557/2.39.1.4586

IDENTIFICATION OF ISSUE

In 2022, between May and September, 2,691 helicopter flights (totaling 1693 hours of flying) were made to support Project-related activities (EDI 2023, Tables 5-2, 5-5). Of these flights, 58% were below the minimum altitudes set by Project terms and conditions for reducing disturbance of migratory birds and established in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) to avoid disturbance of other wildlife (EDI 2023, Table 5-5; BIMC 2016, Section 3.3.2). Although most of these low-level flights had a rationale for flying below minimum altitude thresholds (and were therefore deemed compliant with Project terms and conditions), low level helicopter flights are a potential source of disturbance to wildlife such as caribou (e.g. Wolfe et al. 2000; Wilson and Wilmhurst 2019).

In the 2022 Annual Report, the proponent provides a summary of the various rationales provided by pilots to justify flying below the minimum altitude thresholds. The most common justification provided was the short distance of a flight. Following up on comments made regarding the 2021 Annual Report (GN 2022 -GN AR Comment #3), the GN seeks to further understand how flights

are being classified as 'short distance' to determine whether this is an appropriate justification for what amounted to 48% of total flying time in 2022.

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

Given the relatively high intensity of Project-related helicopter traffic, and the expectation that this will continue, it is important to understand the basis upon which low level flying is being justified. In this regard the following comments are noted:

1. Table 5-5 (EDI 2023) indicates that 52% of helicopter hours flown in 2022 were below minimum altitude requirements set in the Project certificate and/or specified in the TEMMP but were classified as compliant because an appropriate justification for low level flying was provided by the pilot. Forty-eight percent of total flying hours in 2022, were below minimum altitude requirements but classified as compliant based on the justification that they were short distance flights (Table 5-7).

2. Table 5-6 of the (EDI 2023) describes short distance flights as: "The short distance between take-off and landing sites does not allow enough time to gain 650 magl [meters above ground level]."

3. In comments on the 2021 Annual Report, the GN asked the Proponent to clarify what criteria (distance and/or time) are used to determine when a flight is of short enough distance or duration to justify being classified as short distance and thus deemed compliant with altitudes specified in Project Certificate. (GN 2022: GN-ARC-03, part (2)). In response, the Proponent provided the following information:

   "The helicopter's average airspeed when not slinging is much faster than while slinging, therefore the pilots aren't expected to be able to reach and come down from 2,132 ft on a distance lower than 15 NM [nautical miles]." (BIMC 2022)

   Based on this response, it seems for the purpose of classification that a short distance flight is defined as one less than 15 nautical miles. However, this is not explicit in Proponent's response and should be clarified.

4. Given the high number of short distance flights conducted in 2022, 906 hours from a total 1,693 flown, it is important to understand whether the distance of these flights fit the definition of short distance provided by the Proponent to justify low level flying. This information is not provided in the annual report.

RECOMMENDATION(S)

The GN recommends that the Proponent:

1. Clarify the definition of a short distance helicopter flight, as used in classifying helicopter flights as compliant or non-compliant, in terms of a specific distance threshold. Please confirm whether short distance flights are defined, for the purpose of the Proponent's annual reporting, as those less than 15 nautical miles.

2. Add to the reporting of helicopter flights, in the current and future annual reports, descriptive statistics of distance for the flights classified as compliant because of short distance. This should include the mean, standard deviation, minimum and maximum distances of the short distance flights.

P.O. Box 1000 Stn.1500
Iqaluit, Nunavut X0A 0H0

C.P. 1000 Succursale 1500
Iqaluit, Nunavut X0A 0H0

(867) 975-7828
(867) 975-7870
www.gov.nu.ca

GN AR # 02	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Caribou Monitoring
Terms and Conditions	NIRB PC (amendment 3) terms and conditions # 54dii, 58f, 53b, 54b, 58b
References	• Agnico Eagle Mines (AEM) Ltd. (2015). Terrestrial Environment Management and Monitoring Plan - Meliadine Gold Project, Nunavut. • Agnico Eagle Mines (AEM) Ltd. (2019). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. • Baffinland Iron Mines Corporation (BIMC). (2016). Terrestrial Environment Mitigation and Monitoring Plan. • Baffinland Iron Mines Corporation (BIMC). (2022). Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2021 Annual Monitoring Report. • Baffinland Iron Mines Corporation (BIMC). (2023). Mary River Project – Sustaining Operations Proposal, NIRB File No. 08MN053 • Environmental Dynamics Inc (EDI). (2023). Mary River Project Terrestrial Environment 2021 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2015). Mary River Project Terrestrial Environment 2014 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2016). Mary River Project Terrestrial Environment 2015 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2017). Mary River Project Terrestrial Environment 2016 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2018). Mary River Project Terrestrial Environment 2017 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2019). Mary River Project Terrestrial Environment 2018 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2020). Mary River Project Terrestrial Environment 2019 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2021). Mary River Project Terrestrial Environment 2020 Annual Monitoring Report.

	• Environmental Dynamics Inc (EDI). (2022a). Mary River Project Terrestrial Environment 2021 Annual Monitoring Report. • Environmental Dynamics Inc (EDI). (2022a). Mary River Project Caribou Monitoring: Triggers and Recommendations. • Government of Nunavut (GN). (2019a). Comments on Baffinland Iron Mines 2018 Annual Report to the Nunavut Impact Review Board. • Government of Nunavut (GN). (2019b). Technical Review Comments for Baffinland Iron Mines Corp.'s (BIMC) "Phase 2 Development" project proposal. • Government of Nunavut (GN). (2019c). Final Written Submissions for Baffinland's (BIMC) "Phase 2 Development" Project Proposal • Government of Nunavut (GN). (2020). Comments on Baffinland Iron Mines 2019 Annual Report to the Nunavut Impact Review Board. • Government of Nunavut (GN). (2022). Comments on Baffinland Iron Mines 2021 Annual Report to the Nunavut Impact Review Board. • Nunavut Impact Review Board (NIRB). (2022). Reconsideration Report and Recommendations for Baffinland's Phase 2 Development Proposal.

IDENTIFICATION OF ISSUE

For monitoring caribou, the Project currently relies on snow track and Height-of-Land (HOL) surveys, as well as the recent addition (in 2021) of a pilot remote camera program. Since 2014, these monitoring programs have recorded no caribou observations, thus leaving the Proponent unable to conclude whether impacts on caribou are occurring despite community concerns that they are witnessing impacts (EDI 2023, Table O; NIRB 2022). Further, the Proponent has concluded that caribou numbers in the vicinity of the Project are too low to warrant either mitigation through adaptive management (e.g. through measures such as road or helicopter traffic management) or the implementation of more in-depth caribou monitoring at a more intensive or regional scale (e.g. EDI 2022a).

As reported in the 2022 Terrestrial Environment Monitoring Report (EDI 2023), the Proponent conducted 4 snow track surveys and 36 hours of HOL surveys in 2022. This yielded zero caribou observations leading the Proponent to conclude again that:

"[B]ecause no caribou tracks were identified during snow track surveys in 2022, it cannot be determined whether Project infrastructure is impacting caribou movement."

and

"To date, insufficient caribou observations during HOL surveys have occurred to assess any Project-related effects on caribou behaviour or habitat use." (EDI 2023a, Table O)

As detailed in comments on six previous annual reports (e.g. GN 2019a, 2020, 2022) and during review of the Final Environmental Impact Assessment for the Phase 2 Development Proposal (GN 2019b, 2019c), the Government of Nunavut (GN) has repeatedly expressed concern that these snow track and HOL surveys continue to fail in meeting the objective of detecting caribou for the purposes of mitigating and monitoring project related effects. The fact that no caribou were observed during the last 9 years of these surveys could be a result of the following:

1) Caribou were not detected because they are simply not present in the area during the survey, owing to low population density or low survey effort.

2) Caribou were not detected due to avoidance behaviour and/or deflection from Project infrastructure and activities.

The GN remains concerned that the current survey methods and level of survey effort do not offer the power to distinguish between these two possibilities. The snow track and HOL surveys have insufficient detection range and are conducted so infrequently that they are very unlikely to detect caribou present near the Project. Contrary to the Proponent's view, the GN deems these monitoring methods inadequate as surveillance mechanisms for triggering mitigation of Project effects on caribou or for acting as an early warning mechanism triggering additional monitoring programs. As such, the GN deems BIMC to be non-compliant with Project Certificate Terms and Conditions 53 (b) and (c), and 58 (b).

In addition to expressing on-going concern about the adequacy of current caribou monitoring methods employed by the Project, the GN seeks clarification from the Proponent about the purpose and objectives of snow track and height-of-land surveys, having noticed inconsistency between the annual reports and recent documents submitted by the Proponent to NIRB.

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

Detailed supporting rationales for the GN's concerns regarding the Project's caribou monitoring programs have been previously provided and are not repeated here (see GN for example GN 2019a, 2020, 2021). Instead, the GN notes some inconsistency in the Proponent's statements regarding the purpose and objectives of these programs.

In response to the GN's comments on caribou monitoring in the 2021 annual report (GN 2022), the Proponent provided the following response:

> "Regarding the Government of Nunavut's (GN's) comment: "Since 2014, these monitoring programs have recorded no caribou observations, thus leaving the Proponent unable to conclude whether impacts on caribou are occurring despite community concerns that they are witnessing impacts…" Baffinland is disappointed to see this statement given the number of times Baffinland has engaged with the GN to discuss the objective and intent of the current monitoring programs. Baffinland has been very clear

that surveillance monitoring (e.g., Height of Land (HOL) and snow track surveys) is not meant to assess Project impacts but rather the presence of caribou in the area."

(BIMC 2022)

This statement indicates that snow track and HOL survey are for surveillance purposes rather than impact monitoring. However, this response contradicts other information that has been provided about these programs. For example:

- Over the last 9 years, successive annual reports for the Project, including the 2021 report, have concluded that:

  "[B]ecause no caribou tracks were identified during snow track surveys in 2022, it cannot be determined whether Project infrastructure is impacting caribou movement."

  and

  "To date, insufficient caribou observations during HOL surveys have occurred to assess any Project-related effects on caribou behaviour or habitat use." (EDI 2023a, Table O)

  These statements suggest that snow track and HOL surveys are indeed the means of monitoring project impact.

- In the Mary River Project – Sustaining Operations Proposal currently under review by NIRB, the Proponent identifies snow track surveys as the only monitoring program to verify the prediction that "The Project will have a not significant effect on caribou movements across Project infrastructure." (Table 6.12, BIMC 2023). Furthermore, when a threshold level of deflections of caribou by the Project is reached (as measured by snow track surveys), adaptive management is to be triggered.

These statements from the Proponent indicate that snow track and HOL surveys are for the purpose of impact monitoring yet the Proponent's response to the GN's comments on the 2021 state that this is not their purpose. These conflicting statements should be clarified by the Proponent. Additionally, if these monitoring programs are for surveillance only and not impact monitoring, the Proponent should clarify what monitoring programs are currently in place to address Inuit concerns about the Project's current impacts on caribou.

Finally, while the GN accepts the Proponent's view that lack of caribou observations from snow track and HOL surveys over the last 9 years may be due to low caribou densities, the Proponent has not accounted for the effect of low survey effort on caribou observations. For example, in 2022, a total 4 snow track surveys were conducted along the Tote Road and no caribou tracks were found. Regardless of the number of caribou near the Project, and without further analysis, this level of monitoring is unlikely to yield useful results. Surveying the road for 4 days in a year for signs of deflection is not sufficient. For comparison, caribou-related road surveys at other mines in Nunavut, such as those in the Kivalliq region, are conducted at least twice weekly (AEM 2015, 2019).

The GN is concerned that this key indicator for adaptive management is not being properly monitored. A substantial increase in monitoring effort is warranted, at least on an interim basis, to prove that current the monitoring efforts are not failing to detect project impacts.

RECOMMENDATION(S)

The GN recommends that:

1. The Proponent clarify the purpose of the snow track and HOL surveys in terms of surveillance or monitoring impacts on caribou.

2. If current monitoring programs are for caribou surveillance rather than impact assessment, the Proponent should identify which programs are currently monitoring Project effects on caribou.

3. To verify the Proponent's assertion that the current low level of survey effort is not impeding the ability to detect project effects on caribou, snow track surveys along the Tote Road should be conducted twice weekly during snow cover seasons for a period of 2 years.

P.O. Box 1000 Stn.1500
Iqaluit, Nunavut X0A 0H0

C.P. 1000 Succursale 1500
Iqaluit, Nunavut X0A 0H0

(867) 975-7828
(867) 975-7870
www.gov.nu.ca

GN AR # 03	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Snow Sampling Pilot Study
Terms and Conditions	NIRB PC (amendment 3) terms and conditions # 36, 50, 54d, 58c, 187 and 188
References	• Environmental Dynamics Inc (EDI). (2023). Mary River Project Terrestrial Environment 2021 Annual Monitoring Report.

IDENTIFICATION OF ISSUE

The Proponent is currently monitoring dust fall via passive samplers which assume, in monitoring project-related dust fall, there is no redistribution dust following its initial deposition on the land. However, this assumption is somewhat tenuous in the environment of north Baffin where deposited dust could be resuspended during windy periods and thus transported greater distances than predicted by dust fall models or passive sampling. In 2022, the Proponent initiated a snow sampling pilot study linking a satellite-derived dust fall index with ground-based measurements of snow dust content. Although, sampling was limited in 2022, results from this study suggest there may be a strong relationship between the satellite-derived Snow Darkening Index (SDI) and ground-based measurements of snow dust content. The annual report does not indicate whether this pilot study will continue in 2023. Given the preliminary results, the GN strongly recommends that this pilot study continue with a greatly enhanced sampling effort. If validated through this pilot study the SDI may prove to be a valuable tool in project monitoring.

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

In 2022, the Proponent conducted a pilot study (the Surface Snow Sampling Pilot Study) looking at the relationship between a satellite-derived index of dust fall, the SDI, and the measured dust content of snow around the Project. As noted in Section 8.4.1.6 of the annual report:

> "[Calculated dustfall accumulation from the passive dustfall monitor deposition rates can provide an estimate of dustfall concentration to apply to the SDI values. This approach assumes no redistribution of dust after deposition and relies on estimating a period over which accumulation occurs. However, the SDI is a measure of the magnitude of mineral dust concentration on the snow surface at the time of image acquisition, which is the result of dust deposition and redistribution."

(EDI 2023)

This section of the report acknowledges that the passive dust monitoring program does not provide an accurate picture of the full extent of dust-fall generated by the Project since it doesn't account for redistribution of dust following its initial deposition. In the often-windy environment of north Baffin, the potential for dust to spread beyond its initial site of deposition is high. Understanding the full extent of dust-fall is important in assessing the impacts of the Project on people and wildlife. The GN thus emphasizes the importance of this pilot study.

The annual report states that there is no significant relationship between SDI and snow dust concentration. However, sample sizes were low (with only 10 samples). Despite this, Figure 8-23 of the report suggests there may be a strong relationship between the SDI and snow dust concentration. If so, accurate monitoring of Project-related dust fall could be reliably accomplished via satellite-based monitoring rather than passive dust fall monitoring; which appears to underestimate dust distribution extent.

RECOMMENDATION(S)

The GN recommends that:

1. The snow sampling pilot study be continued into 2023 and 2024 and that the future results be presented to the Project's Terrestrial Ecosystem Working Group and future annual reports.

P.O. Box 1000 Stn.1500
Iqaluit, Nunavut X0A 0H0

C.P. 1000 Succursale 1500
Iqaluit, Nunavut X0A 0H0

(867) 975-7828
(867) 975-7870
www.gov.nu.ca

---end---

P.O. Box 1000, Stn. 1500
Iqaluit, Nunavut X0A 0H0

C.P. Box 1000, Succursale 1500
Iqaluit, Nunavut X0A 0H0

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Government of Nunavut
Nunavut Kavamat
Gouvernement du Nunavut

(867) 975-7800
(867) 975-7870
www.gov.nu.ca