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Building *Nunavut* Together
Nunavut liuqatigiingniq
Bâtir le *Nunavut* ensemble

June 23, 2023

Leah Klaassen
Technical Advisor II
Nunavut Impact Review Board
P.O Box 1360
Cambridge Bay, NU X0B 0C0

Sent VIA Email: info@nirb.ca

RE: NIRB File No: 03MN107 and 16MN056 Comment Request for Agnico Eagle's Meadowbank Complex Project 2022 Annual Report

Dear Leah Klaassen,

The Government of Nunavut (GN) would like to thank the Nunavut Impact Review Board (NIRB) for the opportunity to review and comment on Agnico Eagle Mines Ltd.'s 2022 Annual Report for the Meadowbank Complex, which reports on the amended Meadowbank Gold Mine Project Certificate (No. 004 Amendment 3) and the amended Whale Tail Pit Project Certificate (No. 008 Amendment 1).

The GN has reviewed the 2022 Annual Report and supplemental documents associated with the Meadowbank Gold Mine and the Whale Tail Pit projects and provides detailed 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 Meadowbank Complex 2022 Annual Report

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

NIRB Project Certificate No. 004 Terms and Conditions 61 and 62(f) state that:

“61. In consultation with EC, Cumberland shall incorporate into the Terrestrial Ecosystem Management Plan and the Air Traffic Management Plan a commitment for aircraft to maintain (whenever possible) a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1000 metres vertical and 1500 metres horizontal distance from observed concentrations of migratory birds, and use flight corridors to avoid areas of significant wildlife importance.”

and

“62. Cumberland shall develop and implement a noise abatement plan to protect people and wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The noise abatement plan will be developed in consultation with Elders, GN, Health Canada (HC), and Environment Canada (EC) and include:

“Require (with the exception of take-off and approach for landing), a minimum flight altitude of 610 metres above ground when flights to and from the mine site are passing sensitive wildlife and bird areas.” (NIRB 2006)

Additionally, the Project’s Terrestrial Ecosystem Management Plan (TEMP), (AEM 2019) includes the following restrictions for helicopters:

- (1) That long-range flights are a minimum of 650 m above ground level, except for take-off and landing;
- (2) Short-range flights are a minimum of 300 m above ground level, except for take-off and landings;
- (3) Caribou groups of 50 or more animals, and muskoxen of 10 or more animals must be avoided by a minimum of 1,000 m vertically and 1,500 m horizontally;
- (4) Flocks of migratory birds must be avoided by 1,100 m vertically and 1,500 m horizontally; and
- (5) Harassing wildlife (flying below 300 m) is expressly forbidden unless animals pose an immediate danger to humans.

During the NIRB's Review of the Whale Tail Project, the GN noted concerns about the potential for helicopters to disturb wildlife such as caribou (GN 2017, Comment GN-10). Similar concerns were expressed by community members from Baker Lake (e.g., Whale Tail Final Hearing Transcripts, 2019, page 561). Accurate and fully transparent reporting of helicopter traffic is important for assessing compliance with mandatory minimum flight altitudes intended to protect wildlife. Identifying where legitimate exceptions to these minimums occurred versus where lack of compliance is occurring is important in order to avoid unacceptable risks to wildlife and access to wildlife by Nunavummiut.

In the 2022 Wildlife Monitoring Summary Report (AEM 2023) data on helicopter flights are summarized by average and average maximum flight altitudes (Table 4-9). The report then goes on to discuss some of the types of flights that occurred below the mandatory minimum altitudes specified in the Project Certificate and/or TEMP. Upon review this information the GN offers the following comments:

1) Of the more than 900 hours of Project-related helicopter flights between spring and fall 2022, a majority occurred below even the lowest of the mandatory minimum altitudes; that set at 300 m for short-range flights only. The GN is concerned about the potential impacts of this low-level flying on wildlife and seeks more from the Proponent to determine if this low-level flying was justified.

2) Mandatory minimum altitudes in the TEMP and Project Certificate are 300 m and 600 m for short- and long- range flights, respectively. However, no definition of 'short' or 'long' -range, in terms of flight time or distance, is provided in either document. In order to properly monitor compliance, the GN requests that the Proponent establish reasonable definitions for short and long-range, and present flight summary data such as that in Table 4.9 of the annual report, according to these types of flights. As a starting point, the GN suggests that short-range be defined as flights of 5 km or less.

3) Table 4.9 of the report summarizes average altitudes and average maximum altitudes of the 266 helicopter flights that occurred in 2022. An additional metric, potentially more useful for assessing impacts of helicopters, would be the amount of time spent flying below the 300 and 600 m altitude minimums. This information can be easily acquired from the GPS track data already available to the Proponent.

4) The report presents three maps showing helicopter flight lines for spring, summer, and fall, 2022 (Figure 4-1 o 4-3). Flight lines for flights that had a maximum altitude of less than 300 m are presented in a different colour from other flights. Presenting in this format is somewhat misleading for 2 reasons:

(a) It only distinguishes flights with reference to the 300 m mandatory minimum altitude set for short-range flights. Many of the flights on these maps are clearly not short-range some being over 100 km in length. Flights should be presented

with reference to both of the minimum altitudes (300 and 600 m) depending upon whether they are classified as short or long-range.

(b) The maps only distinguish flights where the maximum altitude is less than 300 m. This presents an extremely biased view since a flight with a maximum altitude above 300 m could still involve flying below 300 m for a substantial portion of the journey. A more accurate representation is to use the average flight altitude (minus take-off and landings) to identify flights that occurred below mandatory minimums.

5) The report provides limited justification for flights occurring below the mandatory minimum altitudes with statements such as:

- “Many low elevation flights are related to slinging operations, and short-distance flights (Figure 4-2). Flights that involve slinging, and some passenger loads required flights under 300 m.”

And

“Some flights for environmental monitoring require lower altitudes, including flights to visually inspect water quality of the water bodies around bridges and roads, inspection of various mine infrastructure for runoffs, lake water sampling, and raptor surveys.”

And

“Flights occurred in 2022 related to search and rescue operations in Baker Lake, where low elevation flights are expected.”

“Meteorological conditions and visibility may also limit flight altitudes.”

(AEM 2023, Section 4.5.9)

More justification for flying below mandatory minimum altitudes is required. In reporting helicopter traffic, AEM should distinguish between flights where low-level flying is required by law, regulations, safety, or the performance of environmental monitoring required under the Project Certificate versus flights where low level flying was the preferred means of flying (but not required by statute, regulation or Project Certificate). For example, statements such as “Flights that involve slinging, and some passenger loads required flights under 300 m” (AEM 2023, Section 4.5.9) seem to be flights where there is no legal requirement to fly low-level but it is the preferred means from an efficiency/time-saving perspective. Transport Canada regulations only specify minimum altitudes for slinging cargo over residential areas.

RECOMMENDATION(S)

Noting the concerns of the community members from Baker Lake and those of the GN regarding potential impacts of helicopters on wildlife, the GN recommends to both NIRB and the Proponent that the following revisions be made to reporting of helicopter traffic in the 2022 and all future annual reports:

1. Based on consultation with the Project's Terrestrial Advisory Group, provide a definition of short and long -range helicopter flights.
2. Summarize annual helicopter flight data, as presented in Table 4.9 of the 2022 report, according to flight range category (short vs long-range) and the appropriate mandatory minimum altitude for each range category (i.e., 300 m for short-range, 600 m for long-range).
3. Report the metric "Hours of Flying Below the 300 and 600 m Altitude Minimums".
4. Provide maps that show short and long-range flights where the average flight altitude (minus take-off and landing) was below 300 and 600 m, respectively.
5. Provide tables, reporting total flight hours and number of flights for short and long -range flights, where average altitudes were below the mandatory minimums of 300 and 600 m respectively; distinguishing, via separate summaries, between flights where low-level flying was required by statute, regulation, or the performance of environmental monitoring required under the Project Certificate versus flights where low level flying was the preferred means of flying (but not required by statute, regulation or Project Certificate). Specific laws, regulations or Project monitoring requirements should be cited for each flight below mandatory minimums based on average flight altitude (minus take-off and landing).

than twice that of the All-Weather Access Road (AWAR), and the large size of haul trucks using it.

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

The report presents a good summary of caribou observational data but fails to conduct the types of in-depth analyses needed to detect trends and associations that may indicate significant impacts are occurring, changes in mitigation are needed or further investigation is required. Given the accumulated time series of data collected since the Project began, more in depth analyses should become an integral part of the annual report. The report should not simply be a basic summary of the data collected in the reporting year but should instead provide a more rigorous examination of whether impacts are occurring. For example:

Section 3.6.3. of the report states:

“The total number of caribou observed along the WTHR in 2022 was slightly lower than numbers observed in 2020 and 2021, and total numbers from 2020-2022 were much lower than 2019 counts (Figure 3-1). Note, total counts across years are not corrected for differences in sampling effort (i.e., the number of surveys), meaning that increases in caribou total counts may be a direct result of a higher number of surveys conducted annually.” (AEM 2023)

The significance of this potentially important observation is not discussed further in the report nor is there discussion about more in-depth analyses that could be conducted using data already available. The Government of Nunavut (GN) notes that caribou counts could have been easily corrected for sampling effort and the results presented in the report. These would have provided a more accurate and informative means of comparing annual variation in caribou counts along Project roads. For example, correcting the total number of caribou counted annually along the Whale Tail haul road during road surveys from 2019 to 2022 by the number of surveys conducted each year demonstrates that caribou counts have steadily declined (Figure 1). During the same period, traffic on the haul road has increased such that caribou counts appear to be negatively associated with haul road traffic levels (Figure 2). While there are multiple explanations for the apparent decline in haul road caribou counts and the association with traffic levels, one hypothesis is that increased traffic on the road (in particular, large haul trucks that operate on the haul road) has led to strong avoidance of the area around the road by caribou. Given the road’s location within the migration routes of several caribou herds, this is a potentially important impact.

Section 3.6.8 of the report summarizes data on caribou that were observed crossing Project roads in 2022. It is noted that a vast majority of caribou observed crossing project roads did so when the roads were closed. For example:

“During spring migration, 91% (478 of 527 caribou) of observed caribou crossings on the WTHR occurred on dates with a WTHR closure (Table 3-15). For annual caribou crossing observations on the WTHR, 83% (706 of 849 caribou) of observed crossing events occurred on dates with a WTHR closure and 15% (128 of 849 caribou) occurred on a day with a speed restriction in place.”

There are two interpretations for these observations. The first is that roads were closed in a highly effective and timely manner allowing approaching caribou to cross. In other words, 2022 road closure mitigation was successful in closing roads often enough, for long enough, and at the right time to allow caribou to cross and avoid delays in migration. The second is that caribou strongly avoid crossing open roads crossing; thus providing quantitative evidence of the importance of closures as a mitigation measure and the need to ensure sufficient periods of closure occur. However, the report does not differentiate or discuss these key differences in interpretation, provide more in-depth analyses to investigate them or draw conclusions about the impact of road closure status on caribou crossing. Instead, the report states that “[C]aribou movement patterns continue to require close monitoring and analysis in 2023.” (AEM 2023)

The suggestion that caribou movements have been, and should continue to be, closely monitored and analyzed is not supported by the lack of depth in the reporting of 2022 caribou crossing observations. More in-depth analyses are needed in-order to closely monitor project effects and support adaptive management. For example, in response to the 2021 Annual Report, the GN presented evidence, derived from data contained within the report, that after correcting for differences in numbers seen, caribou were 2-4 times more likely to be observed crossing closed versus open roads (GN 2022, GN comment #5). This finding suggests that most caribou are observed crossing roads during periods of closure in part because they strongly avoid crossing open roads; not simply because mitigation efforts were successful in closing roads often enough, for long enough, and at the right time to allow caribou to cross. Although a rudimentary approach, this highlights the importance of distinguishing between findings that could indicate the success of mitigation measures or the strength of negative effects.

Figure 1 – Annual variation in the average number of caribou observed per road survey on the Whale Tail haul road. (Data from AEM 2020, 2021, 2022, 2023. Note: Data for 2018 were excluded since road survey effort did not span the full year, in particular the peak spring migration period, and most surveys [36 of 41] were conducted in the winter)

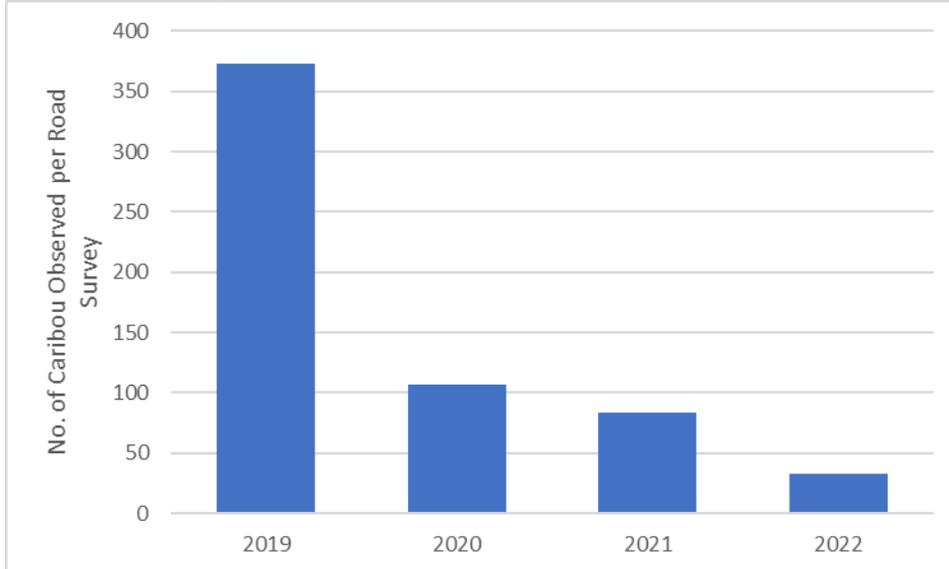
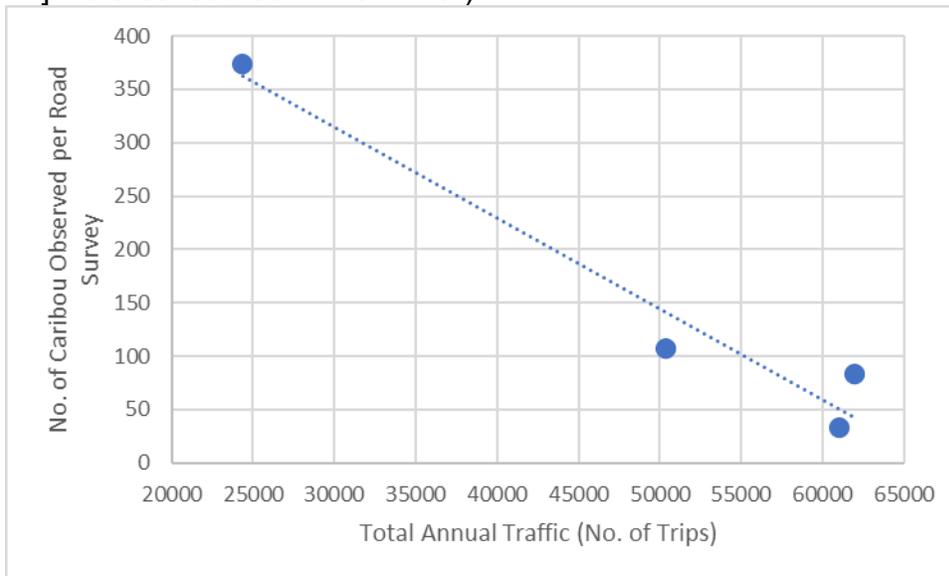


Figure 2 – Association between total annual traffic levels on the Whale Tail haul road and the average number of caribou observed during surveys of this road for each year since mining operations began at the Whale Tail pit, 2019-2022. (Data from AEM 2020, 2021, 2022, 2023. Note: Data for 2018 were excluded since road survey effort did not span the full year, in particular the peak spring migration period, and most surveys [36 of 41] were conducted in the winter)



RECOMMENDATION(S)

The GN recommends that:

1. In future reports, the Proponent includes summaries of the number of caribou observed annually and seasonally during road surveys, corrected for survey effort, for the AWAR and WTHR. Comparison of annual variation in these metrics should also be presented.
2. In future reports, the Proponent includes analysis of caribou road crossing probability for open versus closed roads based on crossing events observed during road surveys; corrected for survey effort and number of caribou present near roads.
3. Prior to drafting the 2023 Annual Report, the Proponent hold a workshop with the Project's Terrestrial Advisory Group (TAG) to reach consensus on additional analyses of caribou monitoring data and metrics that will be included in future reports.

essential vehicles shall include vehicles and equipment used to continue mining operations or hauling of ore.

Section 3.6.7 of the 2022 Annual Report, states:

“During periods of road closures or Level 3 status, a daily meeting is held with all departments to validate the essential needs requiring access to the roads (road maintenance, food, etc.). From this meeting, departure time, departure location, and the list of vehicles authorized to travel on the road will be determined. Only essential vehicles are permitted in convoys.” (AEM 2023)

The convoys operated on closed roads in 2022 are summarized in Table 3-14 of the report. Upon review of this table the following concerns are noted:

- For thirteen of the convoys on the Whale Tail Haul Road (WTHR), 11 of which occurred during the spring caribou migration, the purpose is described as for “passenger transport”. It is unclear from the information provided how this purpose fits the definition of essential traffic in the TEMP. Why are the passenger transports necessary for maintaining the safety of personnel, Emergency Response Team (ERT), security, or wildlife monitoring?
- Between April 10 to 17, there were 10 one-way convoys south or north-bound on the WTHR, including 3 round-trip (two way) convoys to bring what is described as “essential needs (food, etc.)” to the Whale Tail mine site. This raises questions about whether convoys are being managed efficiently to minimize the number needed. For example, why were 3 round-trip convoys for essential needs required within a week?

RECOMMENDATION(S)

The GN recommends the following:

1. The Proponent explain how the passenger transport convoys that took place on the closed WTHR in 2022 fit the definition of essential traffic in the Project’s TEMP. Why were passenger transports necessary for maintaining the safety of personnel, ERT, security, or wildlife monitoring?
2. The Proponent explain why 3 round-trip convoys for essential needs (food, etc.) were necessary between April 10 and 17.
3. The Proponent explain how convoys are managed to minimize the frequency of trips.

4. The Proponent explain what procedures are in place to manage stores of essential supplies (including food and fuel for maintenance of facilities) at the Whale Tail site in preparation for and during caribou migration seasons? Does the Proponent stockpile these supplies prior to migration seasons in anticipation of road closures? Since the Whale Tail site went into production in 2019, what specific measures has the Proponent taken to stockpile supplies prior to caribou migration periods in-order to minimize the need for convoys on closed roads?

A review of Appendix A of the report (AEM 2023), indicates that in general project roads were closed in 2022 in accordance the caribou decision tree procedures in the TEMP (Figure 7 and 8, AEM 2019). However, several areas of uncertainty were found as summarized in Table 1 below.

Table 1: Dates in 2022, when caribou groups above the GST were observed within 1.5 km of a project road, for which there are questions regarding the mitigation response.

Road	Date	Caribou Group Size	Question to AEM
WTHR	April 9	110	Seems road was not closed until the 10 th . Why was closure delayed?
	April 14	63	Mitigation listed in Appendix A is “open/closed”. What does this mean?
	April 15	55	Mitigation listed in Appendix A is “open/closed”. What does this mean?
	April 20	40	Mitigation listed as speed restriction. Why wasn't the road closed?
AWAR	April 9	70	Mitigation listed in Appendix A is “open/closed”. What does this mean?
	April 18	134	Mitigation listed in Appendix A is “open/closed”. What does this mean?

2) Duration of road closures and consultations prior to reopening

Table 3-9 of the report summarizes the number of days each month of 2022 that Project roads were closed for caribou. The table distinguishes between closures that last 24 hours versus those less than 24 hours. While this a useful table, the report does not provide information on the specific duration of road closure, the rationale for reopening or the required consultation that occurred on each occasion. A table is needed in the report that provides the specific dates during caribou migration seasons on which roads were closed for caribou, the duration of each closure, a summary of the consultation conducted prior to reopening on each occasion (including whether consensus was reached) and the final rationale for reopening. This table is requested so that reviewers can more fully understand how road mitigation is being implemented and how the consultation process leading to reopening is functioning. Demonstrating that the obligation to consult has been met is of particular importance.

RECOMMENDATION(S)

The GN recommends:

1. The Proponent responds to the GN's questions listed in Table 1 above.
2. That in future annual reports the Proponent include a table providing the following information:
 - The specific dates during caribou migration seasons on which roads were closed for caribou;
 - The duration of each closure;
 - A summary of the consultation conducted prior to reopening on each occasion (including whether consensus was reached); and
 - The final rationale for reopening.

ranging from ATVs to haul trucks since these factors may represent differing levels of disturbance to caribou.

IMPORTANCE TO REVIEW AND SUPPORTING RATIONALE

In reviewing the caribou behaviour study, the GN offers the following comments:

1) Vehicle/Road Type

The analyses presented in Appendix I (AEM 2023a) pool data collected along the Project's AWAR and WTHR. These two roads have differing intensities and types of traffic as well as different levels of hunting pressure. As such, behavioural responses of caribou near these two roads may differ to some degree. As the body of data collected by the study increases, future analyses should differentiate between roads and/or types of traffic (e.g., haul trucks, vans, pick-ups/cars, ATVs).

2) Walking behaviour

Walking was a common behaviour observed during the study. However, the report states that:

“The occurrence of disturbances resulted in a statistically significant increase in the proportion of response behaviour (Table 6.4-1; estimate: 0.07 ± 0.26 , p-value = 0.001), but was not important for the proportion of walking behaviour (Table 6.4-2). This may be because the amount of variability in caribou walking is much higher than caribou alert or running. Caribou are more likely to be walking as both a baseline behaviour and a response behaviour, and therefore the effect of disturbances is more difficult to detect in the modelling process.” (Section 6.4.3, AEM 2023a)

Although the analyses presented in the report treat walking as a separate behavioral category, they do not attempt to differentiate it as a response or non-response behaviour with respect to disturbance. Caribou may walk for the purpose of foraging, migration, or response to a disturbance. Direction of travel should therefore be incorporated into analyses to try and differentiate between caribou that are walking towards, away, or parallel to perceived disturbances such as roads and vehicles. It is noted that the study methodology was modified in 2022 to begin collecting data on direction of travel, but it appears from the report that direction is being categorized as either perpendicular to road or parallel. Travel perpendicular to a road should be further categorized as travel towards or away from a road, considering direction of migration as an interacting factor.

3) Time to return to 'normal' behavior

The study found that caribou behavior seems to return to normal 3 to 6 minutes after disturbance from traffic. This is a useful finding, but its significance as an effect of the Project on caribou is not placed into context with the Project's operational landscape. For example, no comparison is made to the frequency of traffic on the different roads despite there being traffic data available. In 2022, traffic frequency on the WTHR averaged 1 vehicle every 8.6 minutes when simply averaged across the year (AEM 2023b, Table 11-3). Actual frequencies may be higher since this average assumes 24-hour traffic and no days of road closure both of which are not valid assumptions.

RECOMMENDATION(S)

The GN recommends the following:

1. Future analyses of the caribou behaviour study in the annual report should differentiate between different Project roads and/or types of traffic (e.g., haul trucks, vans, pick-ups/cars, ATVs).
2. Study methodology should be modified such that future analyses are able to categorize travel direction as towards, away, or parallel to roads, accounting for prevailing direction of migration as an interacting factor.
3. Study results should be discussed in the context of data on daily and seasonal traffic frequencies on Project roads and the potential for open roads to act as a barrier to movement of caribou.

