October 20, 2023

Mark Nelson and Nicole Goodman
Environmental Superintendents
Diavik Diamond Mines (2012) Inc.
PO BOX 2498
SUITE 300, 500750TH AVENUE
YELLOWKNIFE NT X1A 2P8
E-mail: Mark.Nelson2@riotinto.com and Nicole.Goodman@riotinto.com

Dear Mark Nelson and Nicole Goodman:

Status of Approval Conditions for the Wildlife Management and Monitoring Plan for the Diavik Diamond Mine

In a letter dated September 18, 2020, the Department of Environment and Climate Change (ECC), formerly Environment and Natural Resources (ENR), informed Diavik Diamond Mines Inc. (DDMI) that they were required under section 95 of the *Wildlife Act* to submit an updated Wildlife Management and Monitoring Plan (WMMP) for approval by the Minister of ECC. ECC received DDMI's updated WMMP on April 1, 2021, and initiated a public review of the document. DDMI responded to comments made on the WMMP and incorporated feedback into a final Tier 3 version submitted for approval November 8, 2021.

ECC approved the WMMP on July 15, 2022, with seven conditions. DDMI resubmitted the WMMP on October 13, 2022, with changes to address the conditional approval letter and discussions with ECC staff in August 2022.

ECC has reviewed the final WMMP and considered the comments submitted on the publicly reviewed version, DDMI's responses to reviewer comments and recommendations, responses to Aboriginal Consultation, previous annual Wildlife Monitoring Plan Reports, and relevant correspondence.

This letter is to notify DDMI that five out of seven approval conditions have been satisfied as outlined in Attachment 1. As per Attachment 1, the two outstanding approval conditions will need to be addressed by December 31, 2023.

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This WMMP addresses some closure-related activities that may be started prior to full closure. A revised Tier 2 WMMP which aligns with the Final Closure and Reclamation Plan and addresses all closure and post-closure activities will be required when DDMI applies to renew their water licence, which expires December 31, 2025, or one year in advance of the end of commercial operations, whichever comes first. Going forward, further direction may be given to DDMI through the annual reporting and review cycle to support adaptive management.

Please contact Dr. James Hodson, Manager, Habitat and Environment, at (867) 767-9237 extension 53231 or by email at james_hodson@gov.nt.ca if you have any questions.

Sincerely,

(for) Erin Kelly, Ph.D.
Deputy Minister
Environment and Climate Change

Attachment 1 - Status of Approval Conditions for the Diavik Diamond Mine Wildlife Management and Monitoring Plan

Attachment 2 – Environmental Monitoring Advisory Board's (EMAB) March 29, 2023, comments on DDMI's updated Zone of Influence (ZOI) analysis Plan

c. Distribution list

Distribution list

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Skye Lacroix
Project Officer
Kitikmeot Inuit Association

Daniel Coombs
Fisheries Protection Biologist
Fisheries and Oceans Canada

Dylan Price
Environmental Specialist
Environmental Monitoring Advisory Board

Kyla Gray
Environment Advisor, Environment
Diavik Diamond Mines (2012) Inc.

Attachment 1 - Status of Approval Conditions for the Diavik Diamond Mine Wildlife Management and Monitoring Plan

The Minister of Environment and Climate Change (ECC) approved the Diavik Diamond Mine Wildlife Management and Monitoring Plan (WMMP) on August 8, 2023, with seven conditions.

Requirement for a Wildlife Management and Monitoring Plan

Under subsection 95(1) of the *Wildlife Act*, a developer may be required to prepare a WMMP for approval by the Minister of ECC, and to adhere to the approved plan if the Minister is satisfied that the proposed development is likely to:

a) *result in a significant disturbance to big game or other prescribed wildlife;*
b) *substantially alter, damage or destroy habitat;*
c) *pose a threat of serious harm to wildlife or habitat; or*
d) *significantly contribute to cumulative impacts on a large number of big game or on habitat.*

The WMMP Guidelines describe the factors that were considered by the Minister in determining whether a WMMP would be required for the Diavik Diamond Mine. On September 18, 2020, a letter was sent to Diavik Diamond Mine Inc. (DDMI) providing the determination that a WMMP was required for this development.

WMMP Timeline

ECC received DDMI's updated WMMP on April 1, 2021 and initiated a public review of the document through the Have Your Say webpage and an email distribution list consisting of government agencies and Indigenous governments and Indigenous organizations party to the Environmental Agreement and regulatory boards. DDMI's responses to the comments were circulated October 18, 2021 and posted to the ECC WMMP Resources page. DDMI responded to comments made on the WMMP and incorporated feedback into a final Tier 3 version submitted for approval November 8, 2021.

ECC initiated Aboriginal Consultation on the WMMP submitted for approval via a letter distributed to potentially affected Indigenous governments and Indigenous organizations on February 16, 2022. ECC received one response by the March 4, 2022, deadline and replied on May 4, 2022.

On July 15, 2022, the Minister of ECC approved the WMMP with seven conditions. DDMI submitted a revised Tier 3 WMMP on October 13, 2022, which reflected changes requested in the conditional approval letter and discussions with ECC staff in August 2022. Additionally, DDMI provided a separate Zone of Influence (ZOI) Analysis Plan on November 10, 2022, as per approval Condition 1.

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On January 11, 2023, the Environmental Monitoring Advisory Board (EMAB) submitted comments and recommendations to ECC regarding their comments and concerns on DDMI's revised Tier 3 WMMP. DDMI provided a revised version of the ZOI Analysis Plan on February 20, 2023, that ECC then distributed for comments. EMAB provided comments and recommendations on March 29, 2023 (see Attachment 2), to ECC and cc'd DDMI in the correspondence. ECC provided EMAB's responses to DDMI on September 22, 2023, after discussion between the two organizations; DDMI had expected ECC to distribute the EMAB ZOI comments, while ECC had assumed EMAB cc'ing DDMI on the correspondence, sufficed. Moving forward, all reviews related to WMMPs will be conducted through the Land and Water Board's Online Review System to avoid such communication issues. Additionally, ECC responded to EMAB's January 11, 2023, letter on March 16, 2023.

Specific comments on the status of the WMMP approval conditions are as follows:

Approval Condition 1: *Given the lack of detail provided about the methods that will be used for ZOI analysis, DDMI will submit to ECC a detailed description of their proposed ZOI analysis methods, including which metrics of mine activity levels will be included as covariates in the analyses and how they will be derived, at least 6 months prior to the submission of the comprehensive WMMP report in 2023. ECC will circulate the description of proposed ZOI analysis methods for a 30-day review period, and DDMI will respond to reviewer comments and indicate how feedback will be incorporated into the comprehensive WMMP.*

This condition was partially addressed. DDMI provided a more detailed description of their proposed ZOI analyses on February 20, 2023. ECC circulated the ZOI analysis on February 28, 2023, and received comments from EMAB on March 29, 2023. Additionally, the Tłı̨chǫ Government contacted ECC on April 21, 2023, requesting further time to review the ZOI Analysis Plan. Timelines were disrupted by evacuations due to wildfires this summer, and after discussions with the Tłı̨chǫ Government, ECC is accepting comments from the Tłı̨chǫ Government until October 19, 2023.

ECC appreciates the additional details provided about the proposed ZOI analysis methods, and DDMI's consideration of methods used in other peer-reviewed studies and the 2021 version of Zone of Influence Technical Task Group (ZOITTG) Guidelines. ECC is generally satisfied with the proposed approach, but has some further comments and recommendations that we ask DDMI to respond to:

1. Caribou Seasonal Range Estimation: ECC shares EMAB's concern about DDMI's proposal to not evaluate ZOI in a specific year if less than 90% of the 95% Kernel Density Estimate (KDE) range for that year overlaps with the Diavik/Ekati 2012 aerial survey study area, or if the annual 95% KDE range does not include the entirety of the Ekati-Diavik mine complex.

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These criteria could result in the exclusion of several years of data. Rather than pre-defining what seems to be an arbitrarily high overlap cutoff to exclude years from the ZOI analysis, ECC would like to see Diavik conduct a sensitivity analysis to determine an appropriate cutoff so as not to exclude too many years from the analysis while still ensuring there is an adequate number of collar locations across the different distance intervals to evaluate ZOI in a given year. For example, DDMI could provide a table that summarizes the percent overlap of annual 95% KDE ranges with the Diavik/Ekati 2012 aerial survey study area, indicates whether the annual range completely contains the Ekati-Diavik mine complex, and indicates the number of collar locations contained in different distance intervals for each year (and number of unique collared caribou). DDMI could also determine what is the minimum number of collar locations across binned intervals required to ensure model convergence and use that as a criteria to exclude specific years, rather than using degree of annual range overlap as the criteria. The WMMP should include a map that shows the Diavik/Ekati 2012 aerial survey study area and proposed binned distance intervals around the Ekati-Diavik mine complex that will be used in the ZOI analysis.

2. Base Habitat Model Extrapolation: DDMI plans to extrapolate Boulanger et al.'s 2021 Base Habitat Model across years (2006-2022) and also extrapolate it to a large portion of the winter season (1 December – 30 April) which was not included in Boulanger's original model, assuming that it will do a good job of predicting caribou habitat selection during these periods where it is extrapolated, and that it will predict habitat selection by Beverly caribou. ECC recommends that DDMI evaluate how well Boulanger's model predicts the distribution of Bathurst collar locations during the winter season (1 December – 30 April) and Beverly location data across all seasons. If extrapolation of Boulanger et al.'s model does not do a good job at predicting habitat selection for this new period and herd, DDMI should fit a new winter season base habitat model using the same covariates as Boulanger et al. 2021 to generate new model coefficients.

To satisfy this Approval Condition, ECC directs DDMI to provide written responses to reviewer comments and questions from EMAB (Attachment 2), the Tłı̨chǫ Government (to be provided on October 19, 2023), and the two points provided above from ECC regarding the ZOI Analysis Plan. DDMI shall incorporate the updated ZOI Analysis Plan, including any further edits in response to ECC, EMAB and Tłı̨chǫ Government comments, into a final version of the WMMP to be submitted to ECC which will be posted on the WMMP Resources webpage. DDMI has indicated in the 2022 Wildlife Management and Monitoring Report that the results of the ZOI analysis will be provided at a later data as an addendum to the 2022 report.

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Approval Condition 2: *DDMI will ensure that Section 5.4.3 of the WMMP clarifies that, although comprehensive analysis and reporting of ZOI will occur in 2023 (which will include data up to the end of 2022), and at the end of closure and in post-closure, in each of these reporting periods annual estimates of ZOI will be reported for all intervening years in which an adequate sample is achieved. Analyses for ZOI will include a covariate(s) reflecting variation in the annual level of mine activity. The year for reporting in post-closure will be identified in the Tier 2 WMMP submitted for the closure/post-closure phase.*

This condition was satisfactorily addressed. See Approval Condition 1's response.

Approval Condition 3: *Diavik will contribute to future GNWT-coordinated efforts to undertake periodic aerial-based ZOI surveys, if deemed necessary.*

This condition was satisfactorily addressed. Aerial surveys were discontinued as part of Diavik's caribou monitoring following discussion between DDMI and ECC at the 2022 Diavik Mine Wildlife Monitoring meetings.

As per the conditional approval letter sent on July 15, 2022, as well as ECC's response on March 16, 2023, to EMAB, ECC reiterates the direction to DDMI in Approval Condition 3 is a requirement, not a voluntary arrangement.

The draft "Guidance for monitoring the zone of influence (ZOI) of anthropogenic disturbance on barren-ground caribou" (ZOITTG 2021) states that aerial survey-based estimates may help to cross-validate collar-based estimates of ZOI and may provide more precise estimates of ZOI if there are sufficient numbers of caribou in the study area or if the number of collared animals overlapping with areas near the mine is low. The guidance document also recommends conducting one aerial survey in each phase of the mine.

In the future, if there is evidence that there may be a sufficient number of caribou interacting with the mines to warrant aerial surveys, ECC will convene a meeting of the organizations participating on the ZOI task group (ZOITTG) to make a decision about whether it is necessary to resume aerial survey-based ZOI assessment.

ECC interprets Section 5.4.5 – Regional Monitoring Efforts of DDMI's WMMP to mean that DDMI will contribute to further aerial survey-based estimates of ZOI if they are deemed necessary.

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Approval Condition 4: *DDMI will, 90 days in advance of adding PK to any pit, submit to ECC for approval, and copy to EMAB and ECCC, comprehensive operating procedures for surveying wildlife presence in pit waters during infilling (e.g. timing, frequency, metrics recorded, triggers for deterrence) and deterrence methods specific to wildlife presence in the waters.*

This condition was satisfactorily addressed. ECC and DDMI met on August 29, 2022, and concluded ECC did not need to "approve" DDMI's SOPs. DDMI will prepare and provide SOPs for review in Annual Reports. Additionally, ECC has reviewed the SOPs in Appendix A of the WMMP and notes that the following SOPs provide comprehensive operating procedures for wildlife presence in waters - Raptor Pit Inspection and Bird Monitoring, Caribou Management-Observation ON and Off East Island and Wildlife Monitoring (Carnivores). ECC reminds DDMI to copy Environment and Climate Change Canada (ECCC) on updated SOPs referencing waterbirds and waterfowl.

Approval Condition 5: *DDMI will increase the blast exclusion zone for caribou to a minimum of 1 km in Section in 4.1.2.*

This condition was satisfactorily addressed. ECC and DDMI met on August 29, 2022, and discussed sensory disturbance and the 500 m distance proposed by DDMI. After internal discussions, ECC sent an email to DDMI on September 29, 2022, stating DDMI will adhere to the setback distance of 1 km. ECC notes that 1 km is consistent with the requirement for blasting at Ekati.

Approval Condition 6: *DDMI will collaborate with EMAB and submit a plan to ECC for approval within 120 days of receipt of this Reasons for Decision that will indicate how it will improve the ability of the caribou behavior monitoring program, using both group scans and focal observations, to generate results that will contribute to the monitoring objective "to determine if caribou behaviour changes with distance from the mines."*

This condition was not satisfactorily addressed. The issue of collaboration between DDMI and EMAB remains outstanding. ECC does not agree with discontinuing EMAB's involvement in the methodology selection as stated in ECC's letter to EMAB on March 16, 2023. Additionally, there was no decision provided by ECC to DDMI allowing DDMI to unilaterally decide the methodology selection. In Table 1: ENR Conditions on the Diavik WMMP, v. 1.2 (Reference No. 21452119-2395-TM-Rev0-13000 dated 23 August 2022), Diavik responded to Condition 6 by saying that in response to the 2021 Mine Wildlife Meeting minutes prepared by ECC, DDMI would revise the WMMP to replace caribou group scan methods with collar behaviour analysis, and that DDMI's 2022 Wildlife Management and Monitoring Report would contain a pooled analysis of existing group scan data to compare against 2011 results.

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DDMI did not provide any evidence that this proposed approach to addressing Condition #6 was based on collaboration with EMAB. ECC expects DDMI to collaborate with EMAB to evaluate and come to agreement on whether there is value in continuing the group scan-based behaviour monitoring program, and if so, how the program can be improved to meet the objective of determining if caribou behaviour changes with distance to the mines. ECC encourages Diavik to provide opportunities for involvement or active participation in the implementation of the monitoring programs with EMAB staff.

To facilitate a resolution to approval Condition #6, ECC will host a meeting with DDMI and EMAB. ECC will follow up with both organizations to arrange a date and time for the meeting.

Approval Condition 7: *Annual reports will be submitted to ECC by April 30 of each year. The next comprehensive analysis reports will be submitted to ECC by April 30 of 2023 and will include data collected up to December 31, 2022.*

This condition was satisfactorily addressed. DDMI provided the 2022 Wildlife Management and Monitoring Report on May 1, 2023, which aligns with the components and objectives of the WMMP and provides the analysis and reporting of data collected using methods described for wildlife valued ecosystem components and other wildlife in the WMMP.

Decision

As per to the Approval Conditions 1-7 listed above, the Minister of ECC confirms that Approval Conditions 2, 3, 4, 5 and 7 of the WMMP for the Diavik Diamond Mine have been met. Approval Conditions 1 and 6 remain outstanding. ECC looks forward to working with DDMI to ensure the outstanding Approval Conditions are met before December 31, 2023.

Attachment 2

Environmental Monitoring Advisory Board's (EMAB) March 29, 2023, comments on DDMI's updated Zone of Influence (ZOI) analysis plan

TOPIC *Be as specific as you think is appropriate; for example a section or page of the document, a recommendation #, general comment, etc.*	COMMENT *Comments should contain all the information needed for the proponent and the Board to understand the rationale for the accompanying recommendation.*	RECOMMENDATION *Recommendations can be for the proponent or for the Board. Recommendations should be as specific as possible, relating the issues raised in the "comment" column to an action that you believe is necessary.*
(DDMI-WMMP-76): Seasonal Range Estimation and Study Area Overlap Threshold, ZOI Analysis Plan, Section 2.1, pg. 2	The ZOI Analysis Plan states that: Annual-seasonal ranges will be reviewed to determine the degree of overlap with the Diavik-Ekati mine complex and to screen out ranges that are predicted to have negligible interactions (i.e., no potential ZOI estimate) between caribou and the mine complex. Each annual-seasonal range will be screened and included in the ZOI analyses if the range contains both Diavik and Ekati mines and at least 90% of the study area (i.e., the 2012 aerial survey study area). For example, if the post-calving range for a given year does not completely contain the Diavik-Ekati mine complex, then no ZOI analysis would be completed. The intent is to not confound detecting a change in distribution with a lack of exposure to sensory disturbance from the Diavik-Ekati mine complex. EMAB understands the intent to examine annual-seasonal ranges to ensure they overlap with the study area and the mines to ensure that any ZOI effect is not confounded with other factors when caribou are farther away from the mine in some years. However, we do not fully understand how the 90% threshold was chosen as the amount of required study area overlap? Are there analyses to support that decision? What happens if an annual-seasonal range overlaps 85% of the study area, would that data be excluded from a ZOI analysis? We are interested to understand how the threshold was chosen and how lower levels of overlap impact ZOI estimation.	Diavik to answer the following questions in detail: a) Why was 90% chosen as the study area-seasonal range overlap cutoff? Please discuss the ecological and analytical impacts of different threshold levels. Please discuss the same in relation to 100% overlap of the Ekati-Diavik mine complex, what happens if less of the mine-complex is inside the annual-seasonal range? b) How flexible will this threshold be if it means sample sizes are continually inadequate for ZOI analysis? What if the annual-seasonal range only overlaps a smaller, but still high (e.g. 80 or 85%) proportion of the study area?

(DDMI-WMMP-76): Seasonal Range Estimation and Study Area Overlap Threshold, ZOI Analysis Plan, Section 2.1, pg. 2 (cont'd)	In general, we are concerned that setting an arbitrarily high threshold would unnecessarily restrict sample sizes for ZOI analysis. Sample size limitation has been a constant issue across many monitoring components during the life of the mine. This concern also applies to the threshold that the annual-seasonal range overlaps **the entire Ekati-Diavik mine complex**, what happens if there is a high degree of overlap, but it is not 100% as outlined in the ZOI Analysis Plan?	
(DDMI-WMMP-77): Total Material Moved Index ZOI Analysis Plan, Section 2.4, pg. 4	DDMI proposes to use Total Material Moved (TMM) as one of the indices for disturbance to correlate with the magnitude of annual-seasonal ZOIs. TMM is assumed to be correlated with a number of potential disturbance covariates, including dust deposition, blast frequency and traffic levels. Is it possible to correlate TMM with dust deposition as measured through the Vegetation and Lichen Monitoring Program? Comparison of empirical estimates of fugitive dust levels with TMM would inform the assumption that the metrics are correlated.	Diavik to answer the following questions in detail: a) Has DDMI monitored dust deposition at the Vegetation and Lichen monitoring plots during operations? b) Could empirical measures of dust deposition collected during operations be used to correlate with Total Material Moved to understand the strength of that relationship rather than making assumptions?

WORKING WITH THE PEOPLE FOR THE ENVIRONMENT

March 29, 2023 By Email

Heather Sayine-Crawford
Director, Wildlife and Fish Division
Environment and Natural Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, NT X1A 2L9

RE: EMAB Review and Recommendations for the Diavik Caribou Zone of Influence (ZOI) Analysis Plan

Dear Heather,

The Environmental Monitoring Advisory Board (EMAB) thanks the (GNWT-ENR) for providing a copy of Diavik's Caribou Zone of Influence Analysis Plan for review.

EMAB has some recommendations on the proposed ZOI Analysis Plan. The Environmental Agreement (EA) mandates EMAB to make recommendations on monitoring reports to achieve the purposes and guiding principles in EA Article I. Attached is an Excel file with EMAB's comments and recommendations on Diavik's proposed ZOI Analysis Plan for your consideration.

EMAB contracted Management and Solutions in Environmental Science (MSES) to review the Caribou ZOI Analysis Plan and provide technical advice to the Board. We attach MSES' review for your information

If you require further information, please contact John McCullum or Mohannad Elsalhy at the EMAB office.

Sincerely,

Charlie Catholiqu,
Chair

CC: EMAB members and alternates (by email)
EMAB Parties (by email)
Kathy Unger, ENR (by email)

Attachments:
Excel Recommendations table
MSES Technical review

Memo

To:	**John McCullum, Executive Director** (emab1@northwestel.net)	File no:	**1342**
From:	Brian Kopach (brian.kopach@mses.ca)	cc:	Mohannad Elsalhy (emab2@northwesttel.net)
Tel:	(403) 400 - 5396		
Date:	**March 21 2023**		

Subject: Review of the Diavik Caribou Zone of Influence Analysis Plan

Plain Language Summary

To satisfy an approval condition for their most recent Wildlife Management and Monitoring Plan (WMMP) for the Diavik mine, Diavik Diamond Mine Inc. (DDMI) was required to develop a plan to monitor the zone of influence (ZOI) for caribou using data from collared caribou during the final years of operations and during closure. The Environmental Monitoring Advisory Board (EMAB or the Board) received a copy of the proposed ZOI methods in late February 2023 and requested that Management and Solutions in Environmental Science Inc. (MSES) complete a technical review of them and comment on: 1) The strength and weaknesses of the proposed methodology for data collection, analysis and reporting, and 2) The scientific defensibility of the proposed methods.

The approach to ZOI analysis proposed by DDMI is scientifically defensible in our opinion because they are planning to follow the analytical methods of other peer-reviewed studies on caribou and their response to disturbances (Polfus et al. 2011, Plante et al. 2018), including those around the Diavik-Ekati mine complex (Boulanger et al. 2012, 2021). This is a strength of the proposed approach to ZOI analysis, along with the fact that DDMI plans to update the base habitat models to better describe winter habitat conditions because caribou are more likely to occur in the region at this time compared to the past.

At this time, we had only a couple clarifying questions about how much overlap between the annual-seasonal range of caribou and the study area is required to see ZOI effects. And about the correlation of Total Material Moved with fugitive dust levels using monitoring data collected during operations.

Introduction

Condition 1 of the Tier 3 Wildlife Management and Monitoring Plan (WMMP) approval for the Diavik mine requires Diavik Diamond Mine Inc. (DDMI) to monitor the zone of influence (ZOI) for caribou around the mine based on guidance provided by the Zone of Influence Technical Task Group. In late 2022, DDMI completed a ZOI methods report that outlined their proposed approach to analysis of the ZOI effect around the Ekati and Diavik mines. DDMI will apply the method in the upcoming 2023 Wildlife Monitoring Report, and then during closure and post-closure of the Diavik mine. The Environmental Monitoring Advisory Board (EMAB or the Board) received a copy of the proposed ZOI methods in late February 2023 and requested that Management and Solutions in Environmental Science Inc. (MSES) complete a technical review of them and comment on: 1) The strength and weaknesses of the proposed methodology for data collection, analysis and reporting, and 2) The scientific defensibility of the proposed methods. We summarize our thoughts on these two questions in the general comments section, and in the specific comments section we identify gaps ask clarifying questions for further consideration by EMAB and DDMI.

General Comments

The ZOI Analysis Plan from DDMI attempts, as much as possible, to follow the same methods for data analysis as previous, peer-reviewed studies, of the ZOI around the Diavik-Ekati mine complex (Boulanger et al. 2012, 2021). The exact computer code was not available so DDMI is proposing to follow Boulanger et al. methods and approaches where possible, but they are also drawing from other peer-reviewed studies of caribou distribution and ZOIs (Polfus et al. 2011; Plante et al. 2018). DDMI will also update the base habitat model used by Boulanger et al. (2021) to incorporate the winter season because caribou occupancy has shifted and there is now a higher likelihood they occupy the area in the winter season. DDMI has also expanded the number of disturbance covariates they will try and correlate with the magnitude of caribou ZOIs to understand the mechanisms that might be driving any observed changes in caribou distribution around the mine complex.

We found the use of peer-reviewed methods, and updating of the base habitat model, to be strengths of DDMIs proposed ZOI analysis plan, and scientifically defensible. We did not identify any major structural weaknesses in the proposed plan, but we did not the high amount of overlap (i.e. 90%) between the annual-seasonal range and the study area around the mine complex. We understand the reasoning behind using range-study area overlap to identify which years to analyze a ZOI effect, but we are unclear why 90% was chosen as the required amount of overlap. We are concerned that an artificially high threshold could limit the data available for examining the ZOI effect and would like to see further reasoning to support the selection of such a high threshold.

Specific Comments

Issue: Seasonal Range Estimation and Study Area Overlap Threshold

Reference: ZOI Analysis Plan, Section 2.1, pg. 2

Comment: The ZOI Analysis Plan states that:

Annual-seasonal ranges will be reviewed to determine the degree of overlap with the Diavik-Ekati mine complex and to screen out ranges that are predicted to have negligible interactions (i.e., no potential ZOI estimate) between caribou and the mine complex. Each annual-seasonal range will be screened and included in the ZOI analyses if the range contains both Diavik and Ekati mines and at least 90% of the study area (i.e., the 2012 aerial survey study area). For example, if the post-calving range for a given year does not completely contain the Diavik-Ekati mine complex, then no ZOI analysis would be completed. The intent is to not confound detecting a change in distribution with a lack of exposure to sensory disturbance from the Diavik-Ekati mine complex.

We understand the intent to examine annual-seasonal ranges to ensure they overlap with the study area and the mines to ensure that any ZOI effect is not confounded with other factors when caribou are farther away from the mine in some years. However, we do not fully understand how the 90% threshold was chosen as the amount of required study area overlap? Are there analyses to support that decision? What happens if an annual-seasonal range overlaps 85% of the study area, would that data be excluded from a ZOI analysis? We are interested to understand how the threshold was chosen and how lower levels of overlap impact ZOI estimation. In general, we are concerned that setting an arbitrarily high threshold would unnecessarily restrict sample sizes for ZOI analysis. Sample size limitation has been a constant issue across many monitoring components during the life of the mine. This concern also applies to the threshold that the annual-seasonal range overlaps **the entire Ekati-Diavik mine complex**, what happens if there is a high degree of overlap, but it is not 100% as outlined in the ZOI Analysis Plan?

Questions:

a) Why was 90% chosen as the study area-seasonal range overlap cutoff? Please discuss the ecological and analytical impacts of different threshold levels. Please discuss the same in relation to 100% overlap of the Ekati-Diavik mine complex, what happens if less of the mine-complex is inside the annual-seasonal range?

b) How flexible will this threshold be if it means sample sizes are continually inadequate for ZOI analysis? What if the annual-seasonal range only overlaps a smaller, but still high (e.g. 80 or 85%) proportion of the study area?

Issue: Total Material Moved Index

Reference: ZOI Analysis Plan, Section 2.4, pg. 4

Comment: DDMI proposes to use Total Material Moved (TMM) as one of the indices for disturbance to correlate with the magnitude of annual-seasonal ZOIs. TMM is assumed to be correlated with a number of potential disturbance covariates, including dust deposition, blast frequency and traffic levels. Is it possible to correlate TMM with dust deposition as measured through the Vegetation and Lichen Monitoring Program? Comparison of empirical estimates of fugitive dust levels with TMM would inform the assumption that the metrics are correlated.

Questions:

a) Has DDMI monitored dust deposition at the Vegetation and Lichen monitoring plots during operations?

b) Could empirical measures of dust deposition collected during operations be used to correlate with Total Material Moved to understand the strength of that relationship rather than making assumptions?

References

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