



May 19, 2017

Chuck Hubert - Senior Environmental Assessment Officer
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Re: Measure 6-2a Caribou Offset and Mitigation Plan

Dominion Diamond Ekati Corporation (DDEC) is pleased to provide the following submission regarding the Jay Project (the Project) as per the *Report of Environmental Assessment and Reasons for Decision* (REA) Measure 6-2a: Caribou Offset and Mitigation Plan (CMP). The conditions associated with Measure 6-2a are provided in Table 1-1. The CMP also addresses conditions identified in Measures 6-3 and 6-5 related to research on dust distribution, and Traditional Knowledge (TK) and community monitoring, respectively.

Condition No.	Description of Condition
i	Dominion will offset residual adverse impacts to caribou by human activities that cumulatively affect the Bathurst caribou herd, beyond direct impacts of the Jay Project. Dominion will set out these offsets in a Caribou Offset and Mitigation Plan, which it will complete within one year of Minister's acceptance of this Report of EA. This plan will be in force throughout the duration of the Jay Project.
ii	Dominion will implement the Caribou Offset and Mitigation Plan as described in DAR-MVEIRB-UT2-06 and incorporate the following into the Plan: <ul data-bbox="461 1507 1328 1822" style="list-style-type: none">• caribou offsets related to roads that result in enhanced mitigation, such as scheduling of activities during caribou migration or dust suppression offsite from Jay Project• zone of influence research with funding as committed by Dominion• identify mitigation actions from the Plan and apply at other Ekati operations• options for the scheduling of other Ekati operations to offset Jay Project impacts during caribou migration periods• an enhanced dust mitigation study including:

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	<ul style="list-style-type: none"> ○ a pilot test on application of dust suppressant ○ a dustfall sampling program ○ report on results and propose improvements to be incorporated into the Air Quality Emission Monitoring and Management Plan ○ if dust mitigation improvements are identified, Dominion will apply them on all roads at Ekati ● accelerate progressive reclamation of Long Lake Containment Facility substantially beyond current Interim Closure and Reclamation Plan requirements to return it to productive caribou habitat sooner ● incorporate waste rock storage area egress ramps, designed in consultation with Elders to prevent injuries and entrapment of caribou
iii	<p>Following implementation of the Caribou Offset and Mitigation Plan, Dominion will:</p> <ul style="list-style-type: none"> ● annually report on the effectiveness of monitoring, mitigation and adaptive management of the Caribou Offset and Mitigation Plan to communities in person in a culturally appropriate manner ● annually report on the activities conducted under the Caribou Offset and Mitigation Plan and the effectiveness of related monitoring, mitigation and adaptive management, to GNWT ENR, WRRB and IEMA ● submit an updated Caribou Offset and Mitigation Plan for approval by GNWT ENR every three years. Prior to approval, the GNWT should provide the opportunity for public comment.
iv	<p>The GNWT will enforce the Caribou Offset and Mitigation Plan under the Section 95 of the Wildlife Act.</p>

EA = environmental assessment; DAR = Developer's Assessment Report; IEMA = Independent Environmental Monitoring Agency; MVEIRB = Mackenzie Valley Environmental Impact Review Board; GNWT = Government of the Northwest Territories; ENR = Department of Environment and Natural Resources (for GNWT).

The CMP was also a result of engagement with Aboriginal communities, government regulators and the Independent Environmental Monitoring Agency (IEMA) during the environmental assessment (EA) review for the Jay Project.



The objectives of the CMP are to mitigate and compensate for residual effects of the Jay Project on the Bathurst caribou. These objectives are met through the implementation of a number of different monitoring programs, additional mitigations and accelerate reclamation activities; all of which are intended to act as offsets.

If you have any questions, please contact the undersigned.

Sincerely,

A handwritten signature in black ink that reads 'Claudine Lee'.

Claudine Lee, M.Sc., P.Geol.
Head of Environment

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CARIBOU MITIGATION PLAN FOR THE JAY PROJECT

Prepared for: Dominion Diamond Ekati Corporation

Prepared by: Golder Associates Ltd.

May 2017

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Abbreviations

Abbreviation	Definition
AQEMMP	Air Quality and Emissions Monitoring and Management Plan
CMP	Caribou Mitigation Plan
CRMP	Caribou Road Mitigation Plan
DAR	Developer's Assessment Report
DDEC	Dominion Diamond Ekati Corporation
EA	environmental assessment
Ekati mine	Ekati Diamond Mine
ENR	Department of Environment and Natural Resources, Government of the Northwest Territories
GNWT	Government of the Northwest Territories
GPS	global positioning system
Project	Jay Project
IBA	Impact Benefit Agreement
ICRP	Interim Closure and Reclamation Plan
IEMA	Independent Environmental Monitoring Agency
LLCF	Long Lake Containment Facility
MVEIRB	Mackenzie Valley Environmental Impact Review Board
PK	processed kimberlite
REA	Report of Environmental Assessment
TK	Traditional Knowledge
WEMP	Wildlife Effects Monitoring Program
WRRB	Wek'èezhi Renewable Resources Board
WRSA	waste rock storage area
ZOI	zone of influence

Units of Measure

Unit	Definition
%	percent
km	kilometre
m	metre

1 INTRODUCTION

The Caribou Mitigation Plan (CMP) for the Jay Project (Project) was a commitment by Dominion Diamond Ekati Corporation (DDEC) during the environmental assessment (EA) review process for the Jay Project (Project) to echo and address concerns expressed by the Parties and community members in their Technical Reports and during the Public and Community Hearings about the decline in the Bathurst caribou herd. An initial draft was provided in DAR-MVEIRB-UT2-06 as an undertaking to the Public Hearing. The information presented here is the CMP that DDEC committed to fully developing in the undertaking. DDEC remains committed to reduce or eliminate any small residual impacts from the Project on caribou and to work with the Government of the Northwest Territories (GNWT) and Aboriginal governments to support the management and protection of the entire herd. The CMP was also a requirement provided by Measure 6-2a from the Mackenzie Valley Environmental Impact Review Board (MVEIRB) Report of Environmental Assessment and Reasons for Decision (REA; MVEIRB 2016) on the Project (May 19, 2016). The conditions associated with Measure 6-2a are provided in Table 1-1. The CMP also addresses conditions identified in Measures 6-3 and 6-5 related to research on dust distribution, and Traditional Knowledge (TK) and community monitoring, respectively.

Table 1-1 Conditions of Measure 6-2a – Caribou Offset and Mitigation Plan

Condition No.	Description of Condition
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Table 1-1 Conditions of Measure 6-2a – Caribou Offset and Mitigation Plan

Condition No.	Description of Condition
iv	The GNWT will enforce the Caribou Offset and Mitigation Plan under the Section 95 of the Wildlife Act.

EA = environmental assessment; DAR = Developer’s Assessment Report; IEMA = Independent Environmental Monitoring Agency; MVEIRB = Mackenzie Valley Environmental Impact Review Board; GNWT = Government of the Northwest Territories; ENR = Department of Environment and Natural Resources (for GNWT); WRRB = Wek’èezhì Renewable Resources Board.

1.1 Mitigation Hierarchy

Caribou and wildlife mitigation commitments for the Project follow the standard mitigation hierarchy (IFC 2012; BBOP 2015), which includes:

- **Avoid:** measures taken to completely avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure and engineered designs of facilities (e.g., waste rock storage areas [WRSAs]).
- **Minimize:** measures taken to reduce the duration, intensity and/or extent of impacts that cannot be avoided.
- **Reclaim:** measures taken to rehabilitate degraded ecosystems or restore ecological function following exposure to impacts that cannot be completely avoided and/or minimized.
- **Offset:** measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimized and/or rehabilitated or restored. Offsets are achieved once compensation is sufficient that the outcome is no net loss or a net gain for the feature (e.g., valued component) for which compensation was developed. Offsets can take the form of positive management interventions, such as restoration of degraded habitat, arrested degradation or averted risk, and protecting areas where there is imminent or projected loss.

Adverse effects from a project should be mitigated as much as possible using avoidance, followed by minimization, reclamation, and finally, offsetting (BBOP 2015). This is because effects that are avoided entirely or minimized mean that the effects from a Project prior to implementing reclamation or offsetting are reduced. The use of offsets also requires that significant effects are measurable through monitoring to determine that an offset results in a neutral or net positive result (i.e., the offset is effective) as described by Federal biodiversity offset guidelines (Government of Canada 2016).

In review of the effects to caribou predicted in the Developer’s Assessment Report [DAR; DDEC 2014]), the incremental decrease in fecundity from the Project was conservatively predicted to be 0.3%, before applying actions in the Caribou Road Mitigation Plan (CRMP). For example, the energetics model assumed that caribou do not habituate to disturbance, do not cross roads, lose same amount of body mass regardless of distance from development, and do not increase food intake outside the zones of influence (i.e., no compensatory foraging). All of these model assumption/conditions likely overestimated the actual decrease in fecundity. The CRMP provides additional mitigation and monitoring to reduce effects to caribou from Jay Road traffic (Section 12.4.2.3.2 of the DAR; DDEC 2014]). The cumulative effects analysis showed that natural factors (such as population cycles and insect harassment) remain

the primary determining factors in caribou energetics, abundance and distribution. Direct habitat loss from the residual physical footprint of the Project (e.g., WRSA) is less than 0.1% of the seasonal ranges of the Bathurst herd. Physical disturbance from previous and existing developments has had little, if any, ecologically measurable influence on the carrying capacity of the seasonal ranges (less than 2% cumulative direct habitat loss). The population modelling completed for Adequacy Review response DAR-MVEIRB-15 (Adequacy Review Item 8.8) demonstrated that the Bathurst herd's ability to increase is dependent on caribou vital rates and is not prevented by cumulative effects of development disturbance. Importantly, all of the analyses used a precautionary approach to predict maximum effects and manage uncertainty; hence, most ecological effects are likely to be considerably smaller than those presented in the assessment making them directly unmeasurable. Measuring effects indirectly through predictive models requires making numerous assumptions that cannot be validated or estimated with enough precision to provide strong linkage to the Project. Without strong linkage, measuring effectiveness of mitigation, including offsets, becomes problematic and results in uncertainty about whether effectiveness has been under or overestimated.

The Project will use hierarchical mitigation to avoid, minimize, and reclaim adverse effects associated with the effects pathways identified in the DAR (DDEC 2014). Measuring the effectiveness of offsets on the abundance and distribution of the Bathurst herd is predicted to not be possible because of the small residual effects calculated for the Project. However, DDEC committed to compensate for the small residual effects to caribou presented in the Jay Project DAR in the form of enhanced mitigation and financial support for caribou research. While these do not technically represent biodiversity offsets, they are consistent with the intent of offsets. Assuming that the predicted mine-related mechanisms (direct habitat loss, dust and other sensory disturbances, barriers to movement/migration) decrease caribou survival and reproduction rates, then by extension reductions in these effects through successful implementation of the CMP should be considered as a trend towards net-neutral or net-positive benefits on barren-ground caribou populations.

The commitments that comprise the CMP consist of:

- Project mitigation;
- financial support for research to inform future actions on the zone of influence (ZOI) and the management of the Bathurst caribou herd;
- offsetting of any small impacts through enhanced mitigation (e.g., CRMP) to be applied to the entire Ekati mine site;
- enhanced dust suppression;
- accelerated progressive reclamation efforts for the Long Lake Containment Facility (LLCF) and WRSAs; and,
- support for community-based monitoring of caribou.

DDEC is also committed to ensuring that TK is used to inform the development and continued adaptive management of the Plan, and will work with Aboriginal communities and/or governments and TK holders during the engagement process for the life of the Jay Project.

The CMP is not part of the Wildlife Effects Monitoring Plan (WEMP) but is related and to the WEMP and other management plans including:

- CRMP (Appendix C of the WEMP);
- Air Quality and Emissions Monitoring and Management Plan (AQEMMP);
- Interim Closure and Reclamation Plan (ICRP); and,
- Waste Rock and Ore Storage Management Plan.

2 PROJECT MITIGATION

In their Technical Report during the EA review of the Project, the Independent Environmental Monitoring Agency (IEMA) argued that because the Ekati mine was part of the existing development landscape, that any modification by DDEC to Ekati mine operation that reduced effects to barren-ground caribou would represent a Project offset of cumulative effects (IEMA 2015). During the EA review, some of the ways identified that this could be accomplished included strategic scheduling of Ekati mine operational activities (including Jay pit development and mining) to reduce disturbance to caribou, development of a CRMP, use of more effective fugitive dust mitigation, and accelerated progressive reclamation of Ekati mine components such as the LLCF and WRSAs. Some of the enhanced mitigations are in place now, such as dust suppression and the CRMP and should be benefitting barren-ground caribou; others will be in place with development of the CMP. These enhanced mitigations are reviewed in the subsequent sections.

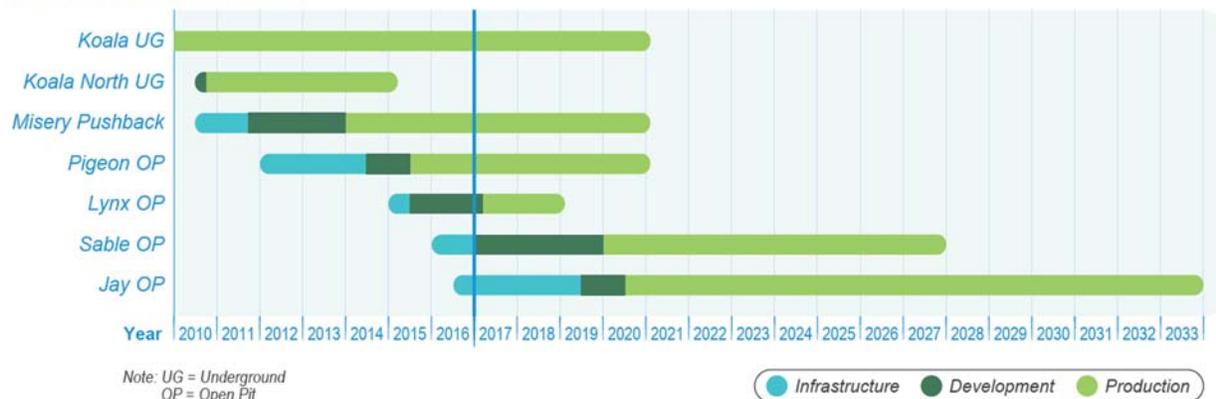
2.1 Ekati Mine Operational Scheduling

Adaptively managing the schedule of Ekati mine operational activities is a form of enhanced mitigation identified in Measure 6-2a that DDEC could implement as part of the CMP. The CRMP provides the mechanism by which operational activities will be managed to mitigate effects to caribou and other wildlife.

However, the currently planned schedule of mining activities (i.e., construction, mining, and closure) may also reduce cumulative effects of development disturbance to barren-ground caribou by minimizing the amount of overlap with mining activities within caribou seasonal ranges, thus limiting cumulative effects from multiple development activities. Figure 2.1-1 shows the current Life of Mine Plan proposed for the Ekati mine and indicates that based on the current Life of Mine Plan, after 2020, mining activities are expected to be limited to the Sable and Jay pits. As per Figure 2.1-1, after 2027, the Sable Pit will no longer be actively mined leaving Jay Pit as the only ore extraction activity at Ekati mine until 2033. Reclamation activities may be under way at five pits by 2020. While the Life of Mine Plan is not designed around caribou, the limited overlap in the mining schedule will be protective of caribou.

Figure 2.1-1 Ekati Life of Mine Plan

Ekati Mine Plan, 2010 to 2030



2.2 Caribou Road Mitigation Plan

During the Project Technical Sessions of the EA review process in April 2015, DDEC made the commitment to provide a CRMP that gives further details on strategies to reduce the impacts from the Jay roads to caribou. The CRMP describes the mitigation and monitoring for the Project roads with respect to caribou and was developed through a series of engagement meetings. Since its initial draft in May 2015, DDEC hosted three workshops and revised the CRMP after each to incorporate feedback from communities, regulatory agencies, and IEMA. The CRMP was revised again based on feedback during the Public Hearings for the Jay Project DAR. Although this plan was developed specifically for the Project, the CRMP is an Appendix in the Ekati mine WEMP (DDEC 2017a) and applies to other roads at the Ekati mine, including the Misery Road and Sable Road. The CRMP was applied to the Misery and Sable mine roads before approval of the Jay Project as form of compensatory mitigation. The most recent version of the CRMP (DDEC 2017a) is currently under review for approval by ENR as required by Measure 6-1.

The objectives of the CRMP are to:

- avoid and minimize (reduce) the risk of caribou and other wildlife mortalities from vehicle traffic;
- avoid and minimize the barrier effect of the Jay and Misery roads (and other Ekati mine roads) to caribou movement and migration; and,
- limit the effect of sensory disturbance from roads and traffic on caribou behaviour.

The CRMP includes progressively enhanced mitigation, which is adaptively managed through monitoring feedback on the proximity and behaviour of caribou to the Ekati mine and roads. The approach of the CRMP is that mitigation and monitoring is intensified through a series of caribou distance-based triggers to manage disturbance, barrier effects and mortality risk by roads and traffic. Examples include reductions in traffic speed or road closures, when triggered, to allow caribou to move across roads and reduce sensory disturbance and mortality risk. Implementation of the CRMP will further reduce the small effects to caribou calculated and described in the Jay Project DAR because the predicted effects did not assume such mitigation was in place during construction and operations.

2.3 Mitigation of Fugitive Dust

Fugitive dust at the Project and Ekati mine is due to wind erosion of fugitive sources, removal and displacement of rock and overburden from the pit, rock crushing, and movement of vehicles/equipment on site. Mitigation to control dust at the Ekati mine has included watering and applying dust suppressant to the roads, and monitoring is completed through the AQEMMP. Further studies on the rate and spatial extent of dust deposition, triggers for adaptive management, and the effectiveness of mitigation methods to limit dust generation are part of the AQEMMP for the Project (DDEC 2017b). This plan meets Measure 6-3 of the REA. For example, recent research on the distribution of dust at the Ekati mine indicates that the spatial extent of dust deposition is within 1 km (Chen et al. 2017).

DDEC is currently completing a pilot test application of an alternative dust suppressant prior to application on the full extent of the Misery Road to determine its effectiveness, given the Ekati mine's unique northern climate and associated challenges. DDEC has begun a comprehensive trial on the Misery Road with the objective to determine whether this product reduces fugitive dust from roads better than current dust suppression practices (Section 3.4.1 of the AQEMMP). DDEC initiated the pilot test application in 2016 before approval of the Jay Project as form of compensatory mitigation. It is assumed that additional

or different mitigation that reduces fugitive dust production will also have a corresponding reduction to sensory disturbance and associated ZOI of caribou (and would be considered off-site and on-site offsetting). However, it is important to note that the relative contribution of dust as a sensory disturbance mechanism to changes to caribou distribution is unknown. Thus, techniques of monitoring caribou distribution (i.e., magnitude and spatial extent of the ZOI) may not be sensitive enough to detect a small change in caribou distribution even if different mitigation reduces the amount and/or spatial extent of fugitive dust. A reduction in fugitive dust represents a successful, measurable improvement to dust mitigation that may be applied to Jay and the Ekati site as an offset. The results of this program will be shared with other mine operators through a best practices document as per Measure 6-1.

This program is expected to cost in excess of \$75,000 a year based on a two year minimum project (\$150,000). Based on the initial program success, the dust suppressant trial will be expanded to the entire length of the Misery Road in 2017. This expanded trial will include reducing the buffer around waterbodies from 30 m to 15 m, which will reduce the untreated segments of the road from more than 6 km to less than 2.7 km. The results of this full scale trial will inform the future of the dust suppressant program on all roads at the Ekati mine site including the Project, which could represent an expenditure of an additional \$975,000 to 2030. *(Note: This does not include the cost of the new product which is approximately 4 times the cost of DL-10 and is expected to be approximately \$1.5 million in 2017.)*

2.4 Progressive Reclamation at the Ekati Mine

The current ICRP for the Ekati mine (ICRP; BHP Billiton 2011) outlines the schedule of reclamation activities for infrastructure. Community organizations and IEMA requested that DDEC consider rescheduling reclamation activities to begin earlier than presented in the ICRP as a means of compensating for the residual effects of the Project. As a result, DDEC committed to rescheduling of reclamation activities at the LLCF and WRSAs as part of the CMP. The Conceptual Closure and Reclamation Plan for the Jay Project (DDEC 2016) included progressive reclamation of the LLCF, and Pigeon and Beartooth pits. The overall reclamation goal for the LLCF is to design and construct a long-term cover that will physically stabilize the processed kimberlite (PK) with a landscape that will be available for human and wildlife use, which is consistent with Measure 6-2a of the REA. The ICRP will be updated and be inclusive following the issuance of the updated Ekati mine Water Licence to incorporate the Project.

DDEC is proposing to complete the progressive reclamation of the LLCF at an accelerated rate. Main focus areas for the acceleration of progressive reclamation will be within the LLCF and the WRSAs. Ekati's reclamation process has been accelerated through a number of factors including:

- expanded scope of reclamation research activities;
- purchase of equipment dedicated to progressive reclamation and research;
- enhanced progressive reclamation in other mine areas; and,
- community input and TK.

An overall site wide reclamation objective for the Ekati mine is that wildlife are able to safely use the reclaimed areas. Currently the ICRP has outlined conceptual locations for the WRSA wildlife access

ramps; however, their specific locations, and design features will require input from community groups. The locations and design are to be defined based on engagement with local communities and their understanding of caribou migration paths and observations made at the site prior to and during operations. DDEC anticipates a potential positive impact to wildlife by constructing wildlife access ramps at an accelerated rate. This accelerated effort would serve as a compensatory off-site mitigation for the Project. The design of the access ramps will require engagement with communities and regulatory agencies. A realistic accelerated effort for the access ramps would be to have closure objectives for WRSAs discussed and designs finalized and constructed after the update of the ICRP that will result from the approval of the Jay Water Licence.

This accelerated effort would, therefore, serve as an off-site compensatory measure for the Project. DDEC's commitment to reclamation can be further observed by the dedication of resources specifically focused on reclamation. Recently, the Reclamation team has been increased in size by adding an Environment Reclamation Specialist to support the current reclamation team with planning, executing and monitoring reclamation projects and research at the Ekati mine site.

2.4.1 Community Involvement and Traditional Knowledge

As part of the CMP, DDEC has acknowledged the value of community engagement and TK. The reclamation plan for 2017 will include the involvement of high school students from the surrounding communities to assist with established and new reclamation research plots, assist with weed management in the main camp area, and with the installation of surface water management channels. DDEC has also proposed the an engagement program with Elders from the community of Kugluktuk. TK held by these Elders regarding northern estuary plants will be used to contribute to the cover system of the LLCF. Following the results of this initial engagement, future engagement plans could involve a trip to Kugluktuk by Ekati's Reclamation team to harvest seed and plant material from the area with the intention of using it as part of the overall LLCF reclamation research.

3 COMMUNITY-BASED CARIBOU MONITORING

Although not specifically a condition of MVEIRB's Measure 6-2a, DDEC will include support for community-based monitoring of caribou as part of the CMP to address conditions in Measure 6-5 pertaining to TK and community monitoring. DDEC committed to the development of a Caribou Monitoring Strategy/Plan in direct collaboration with Impact Benefit Agreement (IBA) communities that will be supported by at least \$100,000 (either direct financial or in kind support) annually from the start of construction to the end of the operations phase (an estimated \$1.3 million total for the Project). This strategy will include some or all of the following:

- workshops with TK holders, community technical experts, and other representatives;
- community site-based monitoring programs for the caribou spring and fall migrations to help understand factors influencing caribou and guide scientific studies;
- a review of previous recommendations from communities on how TK should be aligned in the Caribou Monitoring programs;
- provision of regular caribou engagement reports to IBA communities; and,
- sharing of scientific information and sampling methods to foster an understanding with the communities on how caribou are monitored at the Ekati mine.

DDEC supported community-based monitoring by the Tłı̄ch̄ Government's Boots on the Ground and the Lutsel K'e Dene First Nation's Moccasins on the Ground caribou monitoring programs, which were initiated in 2016. DDEC also contributed to the Lutsel K'e Dene First Nation's harvest monitoring program, which builds on the existing Ni Hat'ni Dene Program. DDEC will continue to work directly with communities to advance this component of the CMP.

4 ZONE OF INFLUENCE RESEARCH

Caribou and other wildlife may alter their movements, behaviour or use of habitat in proximity to developments in response to sensory disturbance. Sensory disturbances from development that may alter how animals may perceive and use otherwise undisturbed habitat include noise, smells, dust, lights and the general presence of people. The spatial (and temporal) extent of a change in movement, behaviour or habitat use across the landscape is termed a ZOI. Various types of caribou monitoring completed near the Ekati and Diavik mines have detected effects to caribou movements at fine scales (ERM Rescan 2014) and feeding decisions by cows with calves at intermediate scales (DDMI 2011). The ZOI for reduced feeding by cows with calves was estimated to be from 5 to 7 km (DDMI 2011). In addition to altering behavioural activities, analysis of radio-collar and aerial survey data have detected an avoidance of caribou from 11 to 14 km from the Ekati and Diavik mines (Boulanger et al. 2012). Thus, sensory disturbance may alter where animals position themselves in space but also may influence their foraging and resting activities.

DDEC committed to provide a total of \$1,050,000 in financial offsetting to support research that assists in determining the drivers of the ZOI and the changes in the Bathurst caribou herd. This financial offsetting will include:

- geo-fence GPS collars to provide finer-scale location data about interactions with the Ekati mine;
- research on the accuracy and precision of ZOI estimation, particularly ZOI magnitude; and,
- research on factors contributing to the decline of Bathurst caribou.

DDEC will form a working group to review proposed research and award funding. It is anticipated the group would include members from community organizations, GNWT Department of Environment and Natural Resources ENR, and DDEC.

4.1 Ekati-Specific Research

DDEC committed to provide funding in 2017 and 2018 (\$300,000 in total) for the installation of 50 geo-fenced collars. In 2016, 17 collars were purchased for deployment by ENR on Bathurst female and male caribou. While not the intent of DDEC's contribution, deployment of geo-fenced collars on males will provide new information since Bathurst caribou males have never been collared previously. The data from the geo-fenced collar program are expected to help evaluate movement responses of caribou to the Jay and Misery roads and Ekati mine facilities.

An added benefit to Bathurst caribou is that geo-fenced collars are approximately half the weight of more traditional collars, which reduces the energetic burden of caribou wearing collars. While these energetics savings may not be measurable, it is consistent with the intent of offsetting and another way that DDEC is compensating for the small residual effects of the Project through the CMP.

4.2 Zone of Influence

DDEC committed to provide \$125,000 in both 2018 and 2019 (\$250,000 in total) for review and analysis of the data from the geo-fenced collar program and to help increase the accuracy and precision of the ZOI. This includes the initial ZOI studies using geo-fenced collar data. Research on ZOI will also include input based on TK as required by Measure 6-5 from the REA.

DDEC will also host a workshop in the latter half of 2017 with communities, ENR, and IEMA to identify and discuss the drivers of caribou ZOI magnitude and spatial extent. The workshop goal will include identifying the key questions concerning the ZOI, with input from TK, and how they might best be answered using current methods including differences in the level of precision. As noted previously, noise, smells, dust, lights, and the general presence of people have been proposed as sensory disturbance mechanisms or drivers of the predicted ZOI. These potential stressors often occur together at the same time and at varying intensities, making it difficult to separate their individual effects on caribou. It is recognized that research into drivers of a ZOI may require assumptions about their ecological and demographic implications to caribou. For example, the spatial extent and amount of dust deposition can be measured with good precision but how this influences fecundity and abundance of caribou at the scale of the herd is problematic because there is no demonstrated empirical linkage. There are numerous natural factors that likely have a larger influence on caribou reproduction, survival, and abundance. As such, results from research on mine-related drivers must assume that any reduction in the potential mechanism (e.g., dust deposition) is predicted to decrease the magnitude and spatial extent of ZOI, and subsequently benefit caribou even though the benefit cannot be measured.

5 BATHURST HERD RESEARCH

DDEC will provide grant funding in the amount of \$200,000 in 2017 and \$100,000 in each of the following three years (2018-2020) towards research to help determine the magnitude and spatial and temporal extents of the key factors limiting the Bathurst herd (i.e., the primary environmental factors that caused the decline of the herd). In addition, knowledge of the key factors limiting the Bathurst population could lead to the development of strategies and plans by government to improve the health of the herd (another form of offsetting).

DDEC expects that TK Holders will be involved in every step of planning and follow-up with respect to research undertaken by governments and co-management boards; from developing questions and methods, to interpreting and communicating the results. The same working group involved in the direction of funds for ZOI research (Section 4) will also review proposals and recommend candidates for overall research on the conservation of the Bathurst herd. DDEC will distribute grant funding in consideration of the recommendations made by the working group. The following environmental and biological factors are put forward as possible research proposals for consideration:

- temporal miss-match hypothesis (forage phenology miss-matched with calving, and/or nutritional condition of forage during lactation and preparing body fat for and during pregnancy);
- sensitivities of pregnancy rates (body mass loss associated with forage quantity or quality);
- influence of wildfire on winter forage availability;
- foraging time within and outside the ZOI, and compensatory foraging; and,
- pregnancy rates (use local knowledge and expertise) combined with government calving surveys (next photo census 2018).

6 REPORTING

The CMP represents a series of DDEC financial and mitigation commitments (Sections 2 to 4) as part of the Project regulatory approvals. These commitments are likely to be completed according to different schedules. The progress or completion of commitments related to Ekati mine operation or closure (Section 2) can be communicated through existing monitoring reports (e.g., WEMP, AQEMMP, ICRP) or reporting of individual research studies (Sections 3, 4, and 5). Submission of these reports will meet the conditions in Measure 13-3 for annual reporting, as well as for the identification of actions or adaptive management and how the EA measures have been met.

For the CMP, Measure 6-2a provides the guidance of annual reporting of the CMP including:

- in person to communities in a culturally appropriate manner; and,
- to ENR, Wek'èezhì Renewable Resources Board, and IEMA.

To meet the reporting requirements of Measure 6-2a, DDEC will prepare a concordance table of the CMP commitments that indicates the commitment status and, when complete, references the associated reports. DDEC will continue to report annually and provide updates on the CMP commitment status every three years to ENR until the conditions of the CMP commitments have been met. Table 6.1-1 provides the current status of CMP commitments.

Table 6-1 Status of Caribou Mitigation Plan Commitments

Commitment	Description of Commitment	Status	Reporting Reference
Operational Scheduling	DDEC will schedule Ekati mining activities to compensate for small residual effects to caribou by the Jay Project.	In progress	CMP, Section 2.1.
Caribou Road Mitigation Plan	DDEC will develop a CRMP to reduce effects to caribou by Jay Project and other Ekati mine road traffic.	Complete	CRMP, March 2017.
Enhanced Dust Mitigation	DDEC will complete a dust mitigation trial and apply the most effective product to Jay and Ekati mine roads.	In progress	AQEMMP (see CMP, Section 2.3).
Progressive Reclamation	DDEC will reschedule reclamation activities earlier to compensate for effects to caribou by the Jay Project.	In progress	CMP, Section 2.4.
Community-based Caribou Monitoring	DDEC will directly support community-based monitoring annually (\$100,000 per year) during Jay Project operation (estimated \$1.3 million for Jay Project).	In progress. Supported Tłı̨ch̨ Government monitoring in 2016, and will support Lutsel K'e Dene First Nation in 2017.	CMP, Section 3.
ZOI Research, Ekati-specific	DDEC will purchase 50 geo-fenced collars (\$300,000 in total) for deployment by ENR.	In progress. DDEC purchased 17 geo-fence collars in 2016, which were deployed on Bathurst caribou. Additional collars will be purchased in 2017 and 2018.	CMP, Section 4.1.

Table 6-1 Status of Caribou Mitigation Plan Commitments

Commitment	Description of Commitment	Status	Reporting Reference
ZOI-drivers	DDEC will provide \$125,000 in both 2018 and 2019 (\$250,000 in total) for review and analysis of geo-fenced collar data to help increase the accuracy and precision of the ZOI.	To begin in 2018.	CMP, Section 4.2.
Bathurst Herd Research	DDEC will provide matching grant funding in the amount of \$200,000 in 2017 and \$100,000 in each of the following three years (2018-2020) towards research to help determine the magnitude and spatial and temporal extents of the key factors limiting the Bathurst herd (i.e., the primary environmental factors that caused the decline of the herd).	In progress.	CMP, Section 5. Chen et al. 2017, Journal of Environmental Protection

AQEMMP = Air Quality and Emissions Monitoring and Management Plan; DDEC = Dominion Diamond Ekati Corporation; CRMP = Caribou Road Mitigation Plan; CMP = Caribou Mitigation Plan; ENR = Department of Environment and Natural Resources; ZOI = zone of influence.

The reporting of the CMP will also include the schedule of financial commitments of the CMP through the next five years, as indicated in Table 6-2.

Table 6-2 Estimated Schedule of Financial Commitments for the Caribou Mitigation Plan

Commitment	Description of Commitment	Total	2016 (Actuals)	2017	2018	2019	2020	2021	2022 onwards
Community-based Caribou Monitoring	DDEC will directly support community-based monitoring annually	\$100,000 per year during Jay Project operation (estimated \$1.3 million for Jay Project)	\$50,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
ZOI Research, Ekati-specific	DDEC will purchase 50 geo-fenced collars for deployment by ENR	\$300,000	\$70,000	\$150,000	\$80,000	-	-	-	-
ZOI Research-Drivers	DDEC will provide \$125,000 over two years for review and analysis of geo-fenced collar data to help increase the accuracy and precision of the ZOI	\$250,000	-	\$125,000	\$125,000	-	-	-	-
Bathurst Herd Research	DDEC will provide matching grant funding in the amount of \$200,000 in the first year and \$100,000 in each of the following three years towards research to help determine the magnitude and spatial and temporal extents of the key factors limiting the Bathurst herd	\$500,000	\$200,000	\$100,000	\$100,000	\$100,000	-	-	-

- = denotes that a financial commitment is not scheduled or required.

DDEC = Dominion Diamond Ekati Corporation; ZOI = zone of influence.

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