



A Preliminary Assessment of Offset
Measures for Caribou for the Development
of the Dominion Jay Diamond Mine

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Introduction

Dominion Diamond Ekati ULC (Dominion, formerly Dominion Diamond Ekati Corporation, DDEC) has obtained approvals to develop the Jay kimberlite pipe (“the Jay Project”) on the edge of, and extending into, Lac du Sauvage in the Northwest Territories. The Jay Project will add to Dominion’s existing operations at the Ekati mine which is located nearby. The company expects that the Jay Project would extend its diamond mining in the region for another 10 years (Dominion 2014b at 1). Components of the Jay Project include the mining pit itself, which will require the berming and dewatering of 4 km² of Lac du Sauvage, a waste rock storage area (WRSA), and a road and powerline of approximately 5 km to connect the Jay mine and WRSA to the site of the Misery Pit. The Jay Project would otherwise use facilities (camp, airstrip, processing plant, etc.) existing for the Ekati mine (Dominion 2014b at 9).

The area of the Jay Project and the existing Ekati facilities is used as a seasonal migration route by the Bathurst herd of barren-ground caribou. It is also used occasionally by the Ahiak and Beverly caribou herds. According to traditional knowledge the esker which runs on the west side of Lac du Sauvage, and between the existing Ekati facilities and the Jay Project site is of particular importance to migrating caribou, as is the Narrows, a small stretch of water southeast of the Jay Project connecting Lac du Sauvage and Lac du Gras. The road and power line components of the Jay Project would cross the esker.

The Bathurst caribou herd is of high cultural and practical importance to indigenous communities. The herd has experienced a dramatic decline in population, from a population of approximately 480,000 in 1985 to 20,000 or less in 2015 (GNWT ENR 2016). The cause of this decline is not simple or apparent, but the cumulative impact of development in the herd range is believed to be one contributing factor (GNWT ENR 2016, Dominion 2014a).

The Jay Project proposal has been reviewed by the Mackenzie Valley Review Board (MVRB or Review Board), which issued a Report of Environmental Assessment and Reasons for Decision (REA) on February 1, 2016 (MVRB 2016). The MVRB considered submissions from Dominion and many other parties. A major aspect of the MVRB review was an assessment of the Developer’s Assessment Report (DAR) prepared for Dominion, one section of which deals with barren-ground caribou (Dominion 2014a).

The DAR examined many potential impacts of the Jay Project, and existing and planned developments, upon the Bathurst herd. These included the barrier effect of roads and direct road mortality, sensory and behavioural disturbance from human facilities and activity, and dust deposition on forage plants. It provided metrics for each of these factors. It determined that most of the effects of development come from loss of habitat quality due to sensory disturbance (Dominion 2014a at 12-131). Its overall conclusion, however, was: “The cumulative effects from the Project and other developments should not

have a significant influence on the ability of the Bathurst caribou herd (and the Ahiak and Beverly herds) to be self-sustaining and ecologically effective” (Dominion2014a at 12-130).

In its REA the MVRB rejected that conclusion, stating (MVRB 2016 at 111-112):

The Review Board finds that the Jay Project is likely to cause significant adverse impacts on caribou, due to:

- new physical and sensory barriers to caribou on an important caribou movement corridor
- the vulnerability of the Bathurst herd at this time
- the addition of impacts from the Jay Project to cumulative effects that are already significant
- flaws in the assessment endpoint as the basis for Dominion’s significance predictions
- the importance of the Bathurst herd to Aboriginal communities
- the lack of a plan to protect and manage the Bathurst caribou herd, despite years of stakeholders’ efforts

The MVRB went on to comment that the DAR’s stated goal of a “self-sustaining and ecologically effective” Bathurst herd was inadequate because it failed to consider that impacts could be significant for other reasons, such as the loss of harvesting opportunities of aboriginal people (MVRB 2016 at 114). The MVRB was also concerned with any additional impacts to the already vulnerable herd.

Despite these finding and the adoption of what it called a “precautionary approach,” the MVRB did not disallow the project. Rather, it stated, “In the Review Board’s view, this does not mean that the Jay Project cannot go ahead, but it means that a comprehensive and innovative combination of mitigation measures is required to reduce the risks of serious harm to the Bathurst herd to the lowest level possible.” (MVRB 2016 at 115). The MVRB required a number of specific mitigation measures to be applied to the design and operation of the Jay Project. It also required a program of offsets, framed as enhanced mitigation. Such offsets had been offered by Dominion as an undertaking (Dominion 2015) during the MVRB hearing. The text of required Measure 6-2(a) is set out in the section below. The response of Dominion has been a Caribou Mitigation Plan (CMP), released in May 2017 (Dominion 2017).

The intent of this document is to apply an evaluation framework for offsetting to the measures required by the MVRB and the approach being taken by Dominion as expressed in its CMP. We have previously provided the Government of the Northwest Territories Department of Environment and Natural Resources with a preliminary evaluation framework (Poulton 2017) and it is that work which will be used herein. A full summary version of that framework is included

as Appendix I. This document will consider the applicability to each section to offset measures planned by Dominion for the Jay Project.

The Measure

Measure 6-2 (a): Caribou Offset and Mitigation Plan (from MVRB 2016)

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 EA Report. 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-UT2-06⁵⁷ and incorporate the following into the Plan:

- *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:*
 - *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. Following implementation of the Caribou Offset and Mitigation Plan, Dominion will:

- *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. The GNWT will enforce the Caribou Offset and Mitigation Plan under section 95 of the Wildlife Act.

Assessment of Offset Provisions

The standard definition of offsetting, as paraphrased in the above-mentioned evaluation framework, refers to the intentional creation of *measurable ecological benefits* to compensate for the residual ecological losses from development (Poulton 2018). Both Dominion and the MVRB are concerned with the impacts upon the Bathurst caribou herd and intend the offset measures to benefit that herd. This task is complicated, however, by the lack of a clear causal link between the measurable impacts of the Jay Project or of the prescribed offsets on the welfare of the herd.

The MVRB accepts the implicit causal connection between road traffic, dust, sensory disturbance and direct habitat loss on the Bathurst herd. It is not possible, however, to trace particular variations in those factors to measurable impacts on the herd. Therefore, while offsetting measures may seek to neutralize these particular discrete factors, it is not possible to measure the benefit to the caribou. Offsetting of the discrete factors amounts to offsetting for caribou only by implication. This complicates the application of the theory of offsetting.

The same gap of uncertainty between the discrete residual impacts and the welfare of the Bathurst herd is referred to in the CMP, which notes that direct offsetting of impacts on the herd is not possible because of the small size of the residual effects (Dominion 2017 at 1-3). It takes the position that the resulting arrangement is not technically a biodiversity offset, but “consistent with the intent of offsets” and part of “a trend towards net-neutral or net-positive benefits on barren-ground caribou populations” (Dominion 2017 at 1-3). This is a reasonable characterization of the apparent intent of the offset program prescribed.

The Mitigation Hierarchy

1. *Has the proponent taken all reasonable measures to avoid environmental impacts?*
2. *Has the proponent taken all reasonable measures to minimize those environmental impacts which are unavoidable?*
3. *Has the proponent taken all reasonable measures to restore on-site environmental loss which might be temporarily unavoidable, but which can be restored?*

Many of the elements of Measure 6-2(a) and the CMP refer to mitigation actions to be taken on the Jay Project. These measures in themselves may be classified as avoidance and mitigation measures, earlier steps on the mitigation hierarchy than offsetting. As such, they reduce the environmental impact, and thus the offset obligations of the Jay Project. The purported offsetting comes from the required application of those mitigations to other Ekati operations, as required by the third bullet in Section ii of Measure 6-2(a) and in the CMP, together with the accelerated reclamation of the Long Lake Containment Facility.

It is beyond our expertise to critique the avoidance, mitigation and on-site restoration measures provided for by the Jay Project. Presumably the MVRB, having access to all evidence and experts, was in the best position to make those assessments. The MVRB accepted the mitigations offered by Dominion (as set out in Section 6.4.5 of the REA) but went further to prescribe extra mitigation measures for caribou aimed at disturbance from roads (Measure 6-1) and suggested work to improve caribou detection technology to enhance all caribou mitigation measures (MVRB 2016 at 129). While the MVRB's decision may always be critiqued, for the purposes of this document it will be treated as an adequate and appropriate consideration of avoidance, mitigation and on-site restoration. The CMP contains a very good articulation of the mitigation hierarchy (Dominion 2017 at 1-2).

The criteria of the mitigation hierarchy, then, will here be assumed to have been met for the purpose of this document.

Clarifying Residual Loss(es)

4. What is the nature of the residual environmental loss(es) after all questions 1 to 3 have been answered in the affirmative?

As noted above, the MVRB did find a number of significant adverse impacts on caribou. Further, setting aside the judgment of significance, the DAR reviews several other impacts. Helpfully, the DAR also provides metrics and quantifications for these impacts. Some of these are summarized on Table 1 below, though these are provided for illustrative purposes only. The particular figures set out in the table should be reviewed for their adequacy and should be supplemented with actual data as it becomes available. The specificity and quantification of these impacts provides a solid basis for the design of offsets and a determination of their adequacy. As noted above, however, the offsetting of each of these discrete impacts will amount to offsetting for caribou only by implication, and thus is not likely to be amenable to measurement.

Table 1 - Identified Impacts of the Jay Project and Applicable Metrics (to be completed by developer in annual reporting)

Nature of Impact	Metric	Projected Residual Impact	Reference(s) (Dominion 2017 page unless indicated otherwise)
Road impacts	Number of truckloads; traffic speed; caribou road mortalities	56 trips per day	12-59 – 12-60; 12-97
Dust dispersal	Kg/h/yr	4,722 kg/h/yr	12-58
Sensory disturbance (scheduling of activities in relation to migration)	Absolute and percentage changes in different quality habitats in each season; Number of disturbance events; Proportional decrease in parturition rates		12-92 – 12-96; 12-102 – 12-115.
Accelerated progressive reclamation of Long Lake Containment Facility			
Injuries and entrapment of caribou at waste rock storage area (egress ramps to be installed)			

Determining Offsetability

5. *Are the objects of the residual loss of high conservation concern?*
6. *Is the object of the residual loss replaceable given the state of knowledge and experience with restoration techniques?*

7. *Are there actual offset opportunities available within the trading rules established? (See the discussion of equivalency below.)*
8. *Is there sufficient expertise and capacity available to actually deliver the planned offset in a timely and reliable manner?*

Clearly the major concern with respect to the offsetability of impacts on the Bathurst caribou herd is the precipitous decline in the herd population over past decades. A leading publication from the Business and Biodiversity Offset Programme (BBOP)* on the limits of offsetting prescribes the dual criteria of irreplaceability and vulnerability to determine whether offsetting is advisable and practical (BBOP 2012). If either of these criteria is considered to be high, offsetting is dictated against as a practical option. In the BBOP scheme, irreplaceability refers to the likelihood that the affected biodiversity will be necessary to meet conservation goals (BBOP 2012 at 5). With the vastly reduced numbers of the Bathurst herd it is likely that any sub-population of surviving animals will play an important role in the herd's eventual recovery, if and when that may come about, or at least none can clearly be considered to be extraneous to that goal.

Vulnerability refers to the "likelihood or imminence of biodiversity loss (e.g., of a particular species) due to current or impending threatening processes." (BBOP 2012 at 5). The population trend data on the Bathurst herd indicates its vulnerability. This concern is amplified by the lack of understanding of the cause of the decline, and thus what measures may be taken to stabilize or grow the population. The BBOP publication notes: "A satisfactory offset for *highly vulnerable* biodiversity features (e.g., regionally or globally threatened species or ecosystems) will generally be difficult and involve high risk for biodiversity, especially where the cause of decline is unknown, or not tractable with current knowledge." (BBOP 2012 at 7, italics in original) One may fairly conclude that the Bathurst herd is of high conservation concern and that any losses to it are not likely replaceable within current knowledge. A strong argument might be made, therefore, that losses to the herd are not offsetable.

If one considers the individual impacts as discrete, rather than components of an overall impact on caribou, then the issue of offsetability is somewhat easier to address. Road impacts, dust dispersal, sensory disturbance, etc. are all amenable to practical reduction measures and, in themselves, are not of critical conservation concern. Given that the causal link to caribou is not well-understood, this places a particular onus on the proponent to demonstrate that the offsetting of the discrete impacts is thorough and

* The Business and Biodiversity Offset Programme is an international collaboration of over 80 government agencies, corporations, environmental groups and researchers working to establish standards, processes and methodologies in the practice of biodiversity offsetting. The author is a member of the Advisory Group of BBOP.

adequate, the risk being that any shortfall in the design or performance of the offsets may trigger unforeseeable effects on the Bathurst herd.

The MRVB held that the Project was not to be disallowed on the basis of its residual effects and could go ahead with the prescribed mitigations (MVRB 2016 at 115), so this issue can be treated as addressed, at least provisionally, notwithstanding the above.

Conservation Objectives and Priorities

- 9. Are the conservation objectives relevant to the project impact clear? Has adequate consultation taken place with communities, stakeholders, indigenous populations, etc. to understand the values at stake? Has enough scientific knowledge been gathered to understand the ecological functions and relationships which support the values and objectives?***

The task of assuring that the environmental objectives of the Jay Project align with community values and are supported by sound science was assigned to the MVRB, and the references to community and expert input throughout the REA suggest that the task was taken seriously.

The goal of the mitigation and offsetting program prescribed by the MVRB is somewhat ambiguous as it is expressed in different terms in various part of the REA. One expression (on page 126) of the MVRB's expectation is that the prescribed measures "will mitigate the significant adverse impacts on caribou that are otherwise likely." Similarly, the goal is subsequently expressed to be to reduce impacts to caribou "to a level where they are no longer significant" and "to the greatest extent possible" (both on page 127). These rather soft expressions are followed, however, by seemingly more absolute language: "to avoid net adverse impacts to caribou" (page 129) and "no net addition of impacts to the Bathurst caribou herd" (page 130). It is somewhat unclear, therefore, if the MVRB is setting a standard for offsetting of strict no net loss or the more relative standard of no significant loss or reduction of impacts to the greatest extent possible. In practice, however, this distinction may not result in any difference in operationalizing the prescribed offsets. The CMP avoids this subject by referring, as described above, to the intention to act consistent with the intent of offsets and in keeping with a trend toward net-neutral or net-positive results.

Equivalency

- 10. What proxies and indicators are necessary and appropriate to measure the status and any change in those objectives?***
- 11. Has the anticipated or actual residual loss from the development project been adequately quantified in the selected metric(s)?***

- 12. Are the outcomes of the offset measures under consideration capable of being measured in those same metric(s)?***
- 13. Using those metric(s) which are common to both the outcomes of the development and the offset measures, what amount of offset measures must be undertaken to produce positive outcomes equivalent to the negative impacts of the development.***

Each of the discrete impacts found by the MVRB is amenable to quantification, and in fact such quantification has been provided in the DAR, and are reproduced in Table 1. Those same metrics should be applicable to the positive impacts of the offset measures prescribed for the Ekati site. In turn, this should provide a reliable guide to the amount of offsetting measures required to produce positive impacts equivalent to the negative impacts of the Jay Project. This is a result of the MVRB prescribing specific offset measures for each discrete negative impact, rather than a more general requirement that offsets address the impact on the population of the Bathurst caribou herd, which, as previously mentioned may not be offsettable.

Permissible Offset Measures

- 14. Is the current ecological composition and status of the offset site (or object, if not site-based) well understood and documented sufficient to describe baseline conditions?***
- 15. Are trends and factors inducing change well understood and documented sufficiently to describe a counterfactual?***
- 16. Do the proposed offset measures serve the conservation objectives?***
- 17. Would the offset measures be carried out otherwise, by the proponent or some other party (including government)?***
- 18. Would the intended outcomes of the offset measures occur otherwise?***
- 19. If the offset is based on positive management actions, what does experience tell us about the chance of success or failure in achieving stated objectives?***
- 20. If the offset is based on averted losses, what is foundation for expecting the losses in the absence of the offset? Is it sufficiently real that the offset adds value?***

The criteria represented by questions 17 and 18 are based on the offset requirement of additionality. In order for a conservation action and its outcome to count as a credit toward offsetting they must not have occurred otherwise, that is in the absence of the offset initiative. This requires an exercise in projecting both the relevant parties' actions and the environmental results of those actions in a hypothetical world where neither the offset nor the primary development project proceed.

In the case of the Jay Project, the offset measures are to be taken at the site of the Ekati mine. In order to determine if those actions are additional we must assess the likelihood that those actions would have occurred, in part or in whole, at the Ekati mine if the Jay Project and its required offsets were not proceeding. The assessment of this baseline situation is obviously an uncertain exercise, but reference can be made to such factors as:

- Other regulatory requirements;
- The Environmental Agreement;
- Financial incentives;
- The pattern of upgrades and improvements in operations at the Ekati mine;
- Dominion and affiliates corporate policies for upgrades and improvements in operations;
- Standards and best practices in the mining industry.

To the extent that a review of these factors suggests that improvements in the Ekati operations might have occurred in any case, those improvements should not count as credit toward the Jay Project offset obligations.

Ekati Mine Operational Scheduling

One aspect of the CMP which is problematic in terms of additionality is the operational scheduling of the Ekati mine (Dominion 2017, s 2.1). Based upon the submission of the Independent Environmental Monitoring Agency (IEMA), Dominion suggests that any modification to Ekati mine operation that reduces the impact on caribou would represent an offsetting of cumulative effects. To qualify as creditable for offset purposes any modification must be additional. The scheduling of mine activities set out in Section 2.1 of the CMP is described as “currently planned” and “not designed around caribou.” It appears, therefore, that the scheduling was already in place and is not in response to the need to offset. This means that it ought not to qualify as a creditable measure for offsetting. Rather, it can be characterized as baseline avoidance or mitigation at the Ekati site.

Caribou Road Mitigation Plan

The status of the application of the Caribou Road Mitigation Plan (CRMP) to the roads of the Ekati mine is more ambiguous, and likely more favourable as an offset measure. The CMP states in Section 2.2:

Although this plan was developed specifically for the Project, the CRMP is an Appendix in the Ekati mine WEMP 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. (Dominion 2017 at 2-2)

The fact that the application of the CRMP to the Ekati roads was done prior to the approval of the Jay Project, if viewed in isolation, might be interpreted to mean that it was not in response to the offset requirement and thus would not be additional. However, it appears that the measure was taken in anticipation of the approval of the Jay Project, something which would be in keeping with the discussions of offsetting before the MVRB panel.

Mitigation of Fugitive Dust

Dominion has applied dust mitigation in the form of watering and application of dust suppressant at the Ekati mine and that can therefore be seen as part of its baseline operating standards. It proposes to conduct a pilot project to test alternative, and presumably improved, dust suppressant on the Misery Road. If the pilot proves successful the new measures will be applied at both the Jay site and Ekati site wide.

The application of either the old or new dust suppressant measures at the Jay site ought to be seen as avoidance or mitigation of impacts (i.e., earlier steps in the mitigation hierarchy), not an offset measure. This is because it is not an improvement upon an existing situation.

Whether the development and application of the improved dust suppressant measures to the Ekati site qualifies as an offset measures depends upon the general test set out above of whether Dominion could reasonably be expected to have taken the measure in the absence of the Jay Project and its offset requirements. In particular one might consider whether such application on all of the Ekati roads might flow from the mitigations required by the MVRB in Measure 6-1, particularly the development of a best practices document on dust management.

One aspect of this measure which is particularly noteworthy is the willingness of Dominion to share any improved technology with other mine operators. While such sharing of best practices is suggested by MVRB Measure 6-1, it would be an extra voluntary step that could magnify the benefit of Dominion's pilot project on the Bathurst herd. The benefits from such sharing, if the new measures were in fact taken up by the other mine operators, should be potentially considered as creditable for offset purposes, depending on if they positively impact the same ecosystem components as the Jay Project, especially the Bathurst caribou herd.

Progressive Reclamation at the Ekati Mine

Dominion has an obligation to reclaim the Long Lake Containment Facility and related Waste Rock Storage Area. Because that obligation pre-dates the Jay Project, compliance with that obligation in itself cannot be considered to be additional and therefore is not a valid offset measure.

In response to the MVRB Measure 6-2a, however, Dominion proposes to accelerate that reclamation. The benefit of the acceleration, therefore, is clearly additional. The additional benefit will be the difference between the positive impact as provided in the accelerated scenario and the positive impact which would have been provided when the LLCF and WSRA would otherwise have been reclaimed. This will include the temporary benefits of restored conditions during the intervening accelerated period and also those benefits which might accrue from maturing or serial succession of the benefits at an accelerated rate in the future.

Research Measures

Part of Measure 6-2a of the MVRB and the CMP (Section 4) is the provision of funding of research into the zone of influence of mines on the Bathurst caribou herd. In addition to that commitment, Dominion is proposing to provide funding for four years of 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)” (Dominion 2017 at 4-3). Specific factors are listed in the CMP as potential subjects for research.

The provision of research as a potential offset measure is often regarded with skepticism. This is because the benefits of the research on actual ecosystem function are speculative. Improved knowledge in itself does not lead to improved ecosystem function, in the absence of further physical measures being taken.

The current situation, however, might be seen as an exception. The collective lack of understanding of the causes of the Bathurst herd decline and the contribution of various potential stressors, including the zone of influence of mines, is clearly a barrier to the management and maintenance of the herd. The crisis in the herd population reduces the risk that research results are likely to be purely academic or sit unused between the covers of a journal. This suggests that in this case the proposed research programs might validly be seen to be additional and valid offset measures. The measurement of the benefits provided by them will be inherently difficult, however, particularly if it is found that the most influential factors affecting the Bathurst herd are not conducive to management actions (e.g. weather, climate change).

Risk Management

- 21. Are the “delivery risks” (the risk of offset measures failing to deliver intended outcomes) well understood and quantifiable?***
 - a. Are the positive management measures the best available?***
 - b. Is the offset employing a variety of techniques or relying on a single technique?***

- 22. Is the risk from the change in location of ecological features or functions well understood and quantifiable?*
- 23. What time lag is expected between the development impacts and the implementation of offset measures? What time lag is expected between the implementation of offset measures and achievement of the target condition? What margin of error surrounds these time estimates?*
- 24. Based on the above, what multiplier is most representative of the total risk and time lags and most likely to mitigate them?*

Neither the REA nor the CMP specify an identifiable and measurable outcome expected from each offset measure. It is therefore impossible to assess any risk that the measure may not achieve that outcome, or in what timeframe. This is particularly so with respect to impacts on the Bathurst caribou herd.

Again, this aspect of assessment is simplified if we focus on the discrete impacts. The expected reduction in dust, for example, at the Ekati operation might only be targeted to match that of the new dust created in the region from the Jay Project. In that case there would seem to be little risk of failure or a significant time lag. Unless the shifting of the location of the dust in the region were deemed to be significant, there may be little need to apply a multiplier.

If, however, the discrete impacts are taken as contributory to caribou welfare, then the degree of uncertainty in their effectiveness would suggest a substantial multiplier. The complication with that, however, is that uncertainty in the caribou outcomes of offset measures is matched by uncertainty in the caribou outcomes of the development impacts.

Long-Term Management

- 25. Is ownership of the offset project (including land and all other assets) clear and legally secured?*
- 26. Is authority and accountability for the long-term management of the project clearly defined? Is it secured through necessary legal arrangements and clarity around decision-making, etc?*
- 27. Does the long-term management system take into account a variety of interests? Is the structure satisfactory to achieve this, if desired?*
- 28. Is there sufficient funding secured to cover all costs of long-term management and monitoring?*
- 29. What are the monitoring requirements of the offset project? Are their clear monitoring protocols and defined time intervals? How is data reported and to whom?*

Virtually all of the offset measures fall within Ekati's ongoing operations. (The only possible exception is any uptake from other mining operations on any new dust suppression techniques that the prescribed research might produce, but the actions of those other companies should not likely be considered Ekati's responsibility or as an offset credit to it.) This means that Ekati not only is able to maintain control of the measures, but is in the only position to do so. There is no need to involve third party managers or trustees.

All of the physical offset measures focus on mitigation of impacts of Dominion's own Ekati operations, impacts which will not endure beyond the life of those operations. There is therefore no need to provide for governance of the offset measures beyond the life of Ekati's operations. The only future-oriented arrangements required to ensure that the offset measures are followed through over their lifespan is adequate enforcement provisions for the MVRB's required measures, something provided by for in Section iii of Measure 6-2(a).

Monitoring and reporting are explicitly provided for in both the REA and the CMP. While some elaboration will likely be required in order develop protocols, etc., the current provisions are likely adequate at this stage.

Social Aspects

- 30. Does the offset project respect all legal and traditional rights?*
- 31. Has consultation with affected communities and stakeholders been adequate to understand their values and concerns?*
- 32. Is traditional knowledge being adequately considered in impact mitigation and offset design?*
- 33. Are there questions of equity between communities or stakeholder groups as a result of the offset? Has that been adequately addressed?*
- 34. Is the offset project creating new opportunities for involvement, education, or employment?*

The ultimate judgment on whether the social aspects of the offset project are adequately dealt with will come from the local communities, both indigenous and otherwise. As well, the courts may be called upon to determine whether the Crown's obligation to consult with First Nations has been satisfied. We are unable to make any judgment on either of those aspects.

However, we note that the MVRB received abundant submissions from affected First Nations and made many explicit references to the Traditional knowledge, views and interests of them. It

has provided for a defined role for traditional knowledge in caribou monitoring and mitigation (Measure 6-5), including Dominion's funding of a Traditional Knowledge Elders advisory group.

Conclusion

The offset provisions for the Jay Project are unconventional in a number of ways. The core dilemma which faces both Dominion and the MVRB is that the causal relationship between the discrete impacts found in the REA and the welfare of the Bathurst caribou herd is unclear. The prescription of offsets is based on the assumption that the discrete impacts must in some manner contribute to the cumulative stress on the herd. Therefore the cumulative positive impacts of the physical offset measures are assumed to benefit the herd. The unclear causation means that it is difficult to judge the adequacy of the offset measures as measurably benefiting the ecosystem of the caribou, a key aspect of the definition of offsetting.

Accepting that limitation, however, the measures to offset the discrete physical impacts (road impacts, dust, sensory disturbance) of the Jay Project can be analyzed using the offset assessment framework that we have earlier provided. While the specifics of performance measures of those physical offset measures have yet to be developed, we believe that they meet the essential criteria to be considered valid. The exception is the scheduling of the operation of the Ekati mine, which was previously decided upon and therefore cannot be considered additional.

Research is often greeted skeptically when offered as a form of offset for a physical impact on the ecosystem. In the current circumstances, however, the lack of understanding of the reasons for the decline of the Bathurst caribou herd give a special weight to the opportunity to improve our knowledge. The research aspect so the CMP can contribute to improved knowledge, which may be essential to the maintenance and sound management of the herd. Given that, the validity of the research as an offset might be viewed more positively.

Saying that those measures can be considered valid, however, leaves open the question of their scope and scale, and whether they will offer benefits of a size comparable to the residual impacts expected from the Jay Project. Those aspects of the offset plan will have to be more fully fleshed out.

Reference List

- Business and Biodiversity Offset Programme (BBOP 2012), *Resources Paper: Limits to What Can be Offset* (Washington D.C.: Forest Trends) online: BBOP <http://www.forest-trends.org/documents/files/doc_3128.pdf>.
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Appendix 1 – Assessment Process Summary

The Mitigation Hierarchy

- 1. Has the proponent taken all reasonable measures to avoid environmental impacts?*
- 2. Has the proponent taken all reasonable measures to minimize those environmental impacts which are unavoidable?*
- 3. Has the proponent taken all reasonable measures to restore on-site environmental loss which might be temporarily unavoidable, but which can be restored?*

Clarifying Residual Loss(es)

- 4. What is the nature of the residual environmental loss(es) after all questions 1 to 3 have been answered in the affirmative?*

Determining Offsetability

- 5. Are the objects of the residual loss of high conservation concern?*
- 6. Is the object of the residual loss replaceable given the state of knowledge and experience with restoration techniques?*
- 7. Are there actual offset opportunities available within the trading rules established? (See the discussion of equivalency below.)*
- 8. Is there sufficient expertise and capacity available to actually deliver the planned offset in a timely and reliable manner?*

Conservation Objectives and Priorities

- 9. Are the conservation objectives relevant to the project impact clear? Has adequate consultation taken place with communities, stakeholders, indigenous populations etc. to understand the values at stake? Has enough scientific knowledge been gathered to understand the ecological functions and relationships which support the values and objectives?*

Equivalency

- 10. What proxies and indicators are necessary and appropriate to measure the status and any change in those objectives?*
- 11. Has the anticipated or actual residual loss from the development project been adequately quantified in the selected metric(s)?*
- 12. Are the outcomes of the offset measures under consideration capable of being measured in those same metric(s)?*

13. *Using those metric(s) which are common to both the outcomes of the development and the offset measures, what amount of offset measures must be undertaken to produce positive outcomes equivalent to the negative impacts of the development.*

Permissible Offset Measures

14. *Is the current ecological composition and status of the offset site (or object, if not site-based) well understood and documented sufficient to describe baseline conditions?*
15. *Are trends and factors inducing change well understood and documented sufficiently to describe a counterfactual?*
16. *Do the proposed offset measures serve the conservation objectives?*
17. *Would the offset measures be carried out otherwise, by the proponent or some other party (including government)?*
18. *Would the intended outcomes of the offset measures occur otherwise?*
19. *If the offset is based on positive management actions, what does experience tell us about the chance of success or failure in achieving stated objectives?*
20. *If the offset is based on averted losses, what is foundation for expecting the losses in the absence of the offset? Is it sufficiently real that the offset adds value?*

Risk Management

21. *Are the “delivery risks” (the risk of offset measures failing to deliver intended outcomes) well understood and quantifiable?*
- a. *Are the positive management measures the best available?*
 - b. *Is the offset employing a variety of techniques or relying on a single technique?*
22. *Is the risk from the change in location of ecological features or functions well understood and quantifiable?*
23. *What time lag is expected between the development impacts and the implementation of offset measures? What time lag is expected between the implementation of offset measures and achievement of the target condition? What margin of error surrounds these time estimates?*
24. *Based on the above, what multiplier is most representative of the total risk and time lags and most likely to mitigate them?*

Long-Term Management

25. *Is ownership of the offset project (including land and all other assets) clear and legally secured?*
26. *Is authority and accountability for the long-term management of the project clearly defined? Is it secured through necessary legal arrangements and clarity around decision-making, etc?*

27. *Does the long-term management system take into account a variety of interests? Is the structure satisfactory to achieve this, if desired?*
28. *Is there sufficient funding secured to cover all costs of long-term management and monitoring?*
29. *What are the monitoring requirements of the offset project? Are their clear monitoring protocols and defined time intervals? How is data reported and to whom?*

Social Aspects

30. *Does the offset project respect all legal and traditional rights?*
31. *Has consultation with affected communities and stakeholders been adequate to understand their values and concerns?*
32. *Is traditional knowledge being adequately considered in impact mitigation and offset design?*
33. *Are there questions of equity between communities or stakeholder groups as a result of the offset? Has that been adequately addressed?*
34. *Is the offset project creating new opportunities for involvement, education, or employment?*