



EA 1314-01

Adequacy Review

Jay Project

Dominion Diamond Ekati Corporation

November 28, 2014

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1 JAY PROJECT – DEVELOPER’S ASSESSMENT REPORT ADEQUACY REVIEW ITEMS

The purpose of the adequacy review is to ensure that each item in the Terms of Reference (ToR) is answered in the Developer’s Assessment Report (DAR) with sufficient information so that the Mackenzie Valley Environmental Impact Review Board (the Review Board) and parties can understand the project and the developer’s impact predictions well enough to produce meaningful and relevant information requests. The DAR was submitted by Dominion Diamond Ekati Corporation (Dominion) on November 6, 2014.

This document lists the adequacy review items that require further information from the developer in order for the DAR to be considered adequate for review by the Review Board and parties. The document lists the adequacy review items by subject that require a response from Dominion as follows:

1. the broad topic for the adequacy item
2. the section of the Terms of Reference where a response to an adequacy review item is required
3. the corresponding section(s) in the DAR where a response to the Terms of Reference item is provided by Dominion
4. a description of why the response provided by the developer in the DAR is not adequate for review
5. the information required from the developer in order to be adequate for review

2 DEVELOPER COMMITMENTS

2.1 Contractors and subcontractors honouring commitments

ToR section

2.5 Developer, bullet 2 Honouring Commitments

DAR Sections with responses

1.2.3 Corporate and Social Responsibility

14.1.3 Existing Ekati Agreements

Adequacy item rationale

Dominion is asked to describe how it will ensure that its contractors and subcontractors honour commitments made by Dominion. In Section 14.1.3.2 of the DAR on page 14-32, Dominion responds by stating that “Contractors are encouraged to adhere to the hiring targets identified in the Ekati SEA...”. A clear description of how Dominion will not simply encourage, but ensure that Dominion commitments are honoured is required before the response to this item can be considered adequate.

Required adequacy item

Please describe how Dominion will not just encourage, but ensure that commitments described in the Socio-economic Agreement, including commitments for hiring, procurement and others are honoured by contractors and subcontractors.

3 PROJECT DESCRIPTION

3.1 Development description - geotechnical technical report

ToR section

6 Development Description

DAR section

3.3 Geological, Geochemical, and Geotechnical Setting

Adequacy item rationale

The ToR requested details about the proposed infrastructure for the Project. One of the largest features for the Jay Project will be the dike around the open pit. The Review Board has retained a third party geotechnical consultant to review the technical information related to the dike design. The DAR references the “Jay Project Geotechnical and Hydrogeological Field Investigation Factual Report” volumes 1 through 3. However, only volume 3 of this report has been appended to the DAR. To allow for a technical review of the dike design, volumes 1 and 2 are needed.

Required Adequacy Item

Please provide volumes 1 and 2 of this report. These reports will be added to Annex IX of the DAR.

4 PROJECT ALTERNATIVES

4.1 Criteria for selecting the preferred alternative

ToR section

7.3.4 Analysis of Alternative Means, bullet 2

DAR section

2.4.7.4 Evaluation Criteria

Adequacy item rationale

Dominion used technical feasibility, economic viability, environmental considerations, and socio-economic considerations as the four broad accounts for the multiple accounts analysis. For each account, sub-accounts (potential impact issues) were identified as the basis for the assessment of each account. Dominion described the indicators used for each sub-account; however, Dominion primarily included a list of the differentiating indicators. A level of transparency is needed to

ensure that Dominion considered all of the potential impacts of concern including those which were identified as non-differentiating.

Required Adequacy Item

Please confirm that all of the indicators described (differentiating and non-differentiating) represent all of the indicators considered. If it does not, please provide a comprehensive list of the indicators considered for each account and sub-account and, if they were identified as non-differentiating, why.

4.2 Sensitivity analysis on multiple accounts analysis

ToR section

7.3.4 Analysis of Alternative Means

DAR section

2.4.7.7.2 Sensitivity Analysis

Adequacy item rationale

The Review Board staff did a check of the math for the sensitivity analysis. There appears to be a discrepancy in the final values calculated.

Required Adequacy Item

Please confirm the overall alternative scores for the sensitivity analysis.

5 ENVIRONMENTAL ASSESSMENT APPROACH

5.1 Approach to cumulative effects assessment - Sable Pit

ToR section

- 3.4 Geographic scope
- 3.6 Other scope considerations
- 7.2 Cumulative effects

DAR sections:

6.5.2.2 Approach to cumulative effects assessment (pages 6-20 to 6-26)

Adequacy Item rationale

The Terms of Reference in Section 3.6 requires that *“the scope of assessment will include cumulative effects. This will involve considering impacts from past, present and reasonably foreseeable future developments or human activities that combine with the impacts of the Jay Project to affect the same valued components.”*

Section 6 of the DAR describes the environmental assessment approach and section 6.5.2.2 discusses the assessment cases. The base case in Table 6.5-1 is defined as including approved projects. This is further defined on page 6-20 as including approved but not yet completed developments such as the Lynx Project. The Sable pit and associated activities (e.g. access and powerline) is also an approved but not yet completed development and therefore has the same status as the Lynx Project.

It is unclear if the base case includes the Sable pit and associated activities (e.g. access powerline) even though Table 6.5-1 implies that as an approved project it should be included. Review of other Sections in the DAR (section 12, Barren-ground caribou and section 13, Wildlife and Wildlife Habitat) indicate that the Sable Pit was not included in the base case effects assessment or the cumulative effects assessment.

Reasonably foreseeable developments are described in Section 6.5.2.4. The Sable, Pigeon and Beartooth projects are referenced on pages 6-25 to 6-26. The Beartooth pit is described as completed and Pigeon is referenced as initiated in 2014. However, page 6-26 states that “development of the Sable kimberlite pipe is not scheduled, and was not included in the RFD [reasonably foreseeable development] case”.

The Ekati Work Program 2015 is currently under review by the WLWB and is in the public domain. Winter road construction and drilling at the Sable pit are proposed under this Work Plan for the coming 2015 winter season.

The development of the Sable pit along with associated works (e.g. access road, powerline) appears to be planned in the near future, is a reasonably foreseeable development and must be included in the cumulative effects assessment for the Jay Project.

Required adequacy item

Please include the Sable pit in the base case, application case and reasonably foreseeable development case in the cumulative effects methodology.

Please conduct a cumulative effects assessment of the Jay Project that includes the Sable pit and any associated activities (e.g. access road, powerline) as a reasonably foreseeable development. The cumulative effects assessment will consider all valued components where cumulative effects were assessed in the DAR with a particular focus on cumulative impacts to caribou and traditional wildlife harvesting.

6 CULTURAL ASPECTS

6.1 Effects on traditional wildlife harvesting and cultural intangibles

ToR section

8.2.1 Impacts to cultural aspects from project components

DAR sections

- 12.2.3 Summary of Local and Traditional Knowledge
- 15.4.1.1.6 Aboriginal Land Users' Intangible Relationship with the Land
- 15.4.1.2, 15.4.1.2.1, 15.4.1.3 Effects on Traditional Wildlife Harvesting

The importance of caribou and caribou hunting to Aboriginal groups is recognized in section 12.2.3. On pages 15-39 to 15-41, Dominion describes the incremental adverse effects from the Project to traditional wildlife harvesting. Dominion concludes that "because no mechanism exists with which to measure the extent of the effect, it has not been evaluated in this analysis".

On page 15-35, Dominion stated that the Project could affect Aboriginal land users' relationship with the land, but argues that discussing the extent or the degree of change "is inappropriate within this assessment and, likely, impossible to achieve".

Adequacy Item Rationale

Section 115 of the MVRMA requires the Review Board to consider the protection of the cultural wellbeing of residents and communities in the Mackenzie Valley. The courts have concluded that "the relationship Aboriginal peoples have with the land cannot be understated" (*Platinex v KI*, 2007). It was included in the Terms of Reference, which requires (Section 8.2.1) "*the analysis of heritage resources inclusive and cultural impacts include both tangible and intangible aspects of culture...*" (p42). Dominion has acknowledged that the Project could cause such an effect (p15-35).

The same section requires that Dominion "*provide a prediction of the total impact of the project on traditional activities, and on the potential for increased or reduced harvesting success including post-mining perceptions of the area for traditional activities and harvesting*". The Terms of Reference require Dominion to predict the impacts of the Project on traditional harvesting activities and on intangibles, even if it needs to do so qualitatively, in a non-mechanistic manner.

Evaluating cultural impacts on intangible values may be best done by a cultural anthropologist. Evaluating impacts on traditional harvesting and on intangible cultural effects can involve conducting a reasonable qualitative analysis using traditional knowledge and community views as a source of information. Such an approach is possible and has been done in previous environmental assessments for cultural impacts.

Adequacy Review Item

Please provide

1. a qualitative assessment of how the Jay Project expansion of the Ekati mine will impact or change the ability of traditional harvesters to hunt caribou and other wildlife, considering the results of population modelling required by item 8.8 below.
2. an analysis of the potential effects of the project on traditional land users that includes intangible cultural effects, including any changes to Aboriginal land users' relationship with the land

These analyses will incorporate traditional knowledge information and the views of traditional harvesters.

7 WILDLIFE AND WILDLIFE HABITAT

7.1 Bioaccumulation of contaminants

ToR section

7.4.3 Potential for bioaccumulation of contaminants from all sources within the food chain

DAR Sections with responses

13.3 Pathway Analysis (p13-74 and p12-53)

Adequacy item rationale

In Section 13.3.2.2.1 (and 12.3.2.2.1, caribou), impacts to wildlife health from runoff and long term seepage from the waste rock storage area are considered. The finding is that long-term seepage from the waste rock storage area is not expected to result in measurable change to wildlife health. To confirm this, Dominion plans to submit an Ecological Risk Assessment to demonstrate the conclusion that there will be no adverse effects to wildlife health associated with exposure to chemicals from the Project.

The section notes that a similar ecological risk assessment was prepared for the Gahcho Kué Project. Based on findings in that document, Dominion predicts that contaminants from the Jay Project will have no influence on the health of wildlife populations. However, potentially acid generating waste rock represents only 6% of the Gahcho Kué waste rock volume while for the Jay deposit potentially acid generating waste rock represents 25% of the waste rock volume. Total volumes of waste rock from the two projects for the purposes of comparison are not provided to reviewers. Predictions of the impacts of contaminants on wildlife health at the Jay Project based on the Gahcho Kué ecological risk assessment findings may therefore not be appropriate.

Required Adequacy Item

The completed ecological risk assessment document is required during this environmental assessment so that predictions of impacts to wildlife health from contaminant release associated with the Jay Project can be predicted.

Please advise the Review Board when the Ecological Risk Assessment for the Jay Project will be submitted.

8 BARREN-GROUND CARIBOU

8.1 Times when caribou are particularly sensitive to potential impacts

Terms of Reference Section

3.5 Temporal scope

DAR Sections with responses

12.2.2.3 Caribou Population Characteristics

12.6.1.2 Determination of Significance

Adequacy item rationale

In the TOR, the temporal scope requires (p. 15) that “The developer will place special focus on the consideration of time during the development when . . . valued components are particularly sensitive to potential impacts . . .”

The DAR notes a recent 73% decline of the Bathurst herd since 2012 but does not identify the accelerated decline as a time of particular sensitivity. Yet the sensitivity will be increased as calf productivity is reduced and cow death rates are high during the accelerated decline¹. The reduced productivity and high death rate reduce the herd’s resilience to cope to increased industrial activities. While Dominion does acknowledge that resilience is reduced during low abundance, this is not analyzed or the implications described for monitoring, mitigation and assessing effects. There is uncertainty about causes of the accelerated decline which then requires a cautious approach to factors including industrial development. Traditional knowledge states that during low numbers and for recovery, respect for caribou has to be increased including how people behave toward caribou².

Required adequacy item

Please describe if and how the accelerated decline since 2012 is a time of particular sensitivity to potential impacts. Please provide an analysis and description of any particular sensitivity relative to assessing potential impacts and designing adaptive management.

In addition, please provide the document referenced in Section 12. 8, p 12-140, of the DAR titled “Boulanger J, Croft B, Cluff D. 2014. Trends in size of the Bathurst caribou herd from the 2014 calving ground reconnaissance survey. Integrated Ecological Research. July 31, 2014.

¹ Boulanger J, Croft B, Cluff D. 2014. Trends in size of the Bathurst caribou herd from the 2014 calving ground reconnaissance survey. Integrated Ecological Research. Unpublished report to Government of the Northwest Territories, July 31, 2014.

² Legat, A., G. Chocolate, B. Gon, S.A. Zoe, and M. Chocolate. (2001). Relationship between caribou migration patterns and the state of caribou habitat - Final Report from Dogrib Treaty 11 Council. Yellowknife: West Kitikmeot Slave Study Society.

8.2 Assessment Methodology – temporal trends

Terms of Reference Section

4.1 Impact assessment steps and significance determination factors

DAR Sections

12.2.2.1 Caribou Distribution and Abundance

Figure 12.4-2 Insect Harassment Indices Defined as Potential Harassment Days

Figure 12.4-3 Annual Trends in Mean Movement Rate (\pm 1SE) for Female Caribou in the Bathurst Herd from June 15 to October 31

Adequacy item rationale

The Terms of Reference require the proponent to identify the natural range of background conditions and current baseline conditions, and analyze for discernible trends over time in each valued component relative to natural or existing variability.

The DAR does not analyze or describe annual trends in seasonal caribou distribution. While the DAR displays annual background conditions for summer movement rates or insect harassment indices, there is no analysis or integration of annual trends that will influence the exposure or sensitivity of caribou. 2014 was a record drought year and this is not examined as to whether there is a trend in drought years.

Required adequacy item

1. Please describe any annual trends in seasonal distribution (especially summer and fall such as a delayed fall migration to below the treeline) and relate these to trends in exposure of caribou to the project. The trends in annual sample for number of satellite collars is needed with a description of how these trends influence the certainty of any trends in distribution.
2. Please analyze annual trends in environmental conditions such as insect harassment and summer drought (including mushroom indices) and relate these to trends in increased sensitivity of caribou to potential impacts. The CircumArctic Rangifer Monitoring and Assessment Network has a retrospective climate database for the seasonal ranges of the Bathurst herd that may be useful.

8.3 Approach to impact classification and significance – effects prediction

Terms of Reference Section:

7.3.3 Impacts to caribou from project components

DAR Sections:

12.4.2.3 Behavior, Energy Balance, and Calf Production

12.4.2.3.1 Methods

Adequacy Item rationale

The TOR required Dominion to analyze how the Project may influence the energy and protein balance of caribou under different seasonal conditions, and to what extent this may affect population demographics. However Dominion uses an energy expenditure model which does not include energy intake through foraging in different habitats or protein. While Dominion described an existing energy protein model as not readily available, it has been applied to other on-going or completed assessments (Baffinland and AREVA) and is underway for the Bathurst herd as a 2014 CIMP project. Dominion does not clarify why a demographic model was not used to describe effects. Linking energy and protein to population model would reduce uncertainty in predicted effects and use existing information on the Bathurst herd. Dominion does not examine how and if enhanced mitigation would reduce cumulative effects.

Required adequacy item

Please revise the approach to cumulative effects and apply a linked protein-energy and population and all available Bathurst herd data to integrate environmental trends and responses to mine activities to increase certainty in projected incremental and cumulative effects. Dominion should examine how and if enhanced mitigation (including on and off site mitigation and trade-offs) would reduce cumulative effects.

8.4 Approach to impact classification and significance – significance determination

4.1 Terms of Reference Section:

4 Assessment methodology

4.1 Impact assessment steps and significance determination factors

DAR Sections:

7.3.3 Impacts to caribou from project components

12.6 Residual Impact Classification and Significance

Adequacy Item rationale

The TOR requires that Dominion “identify, and provide an opinion on the significance of any residual adverse impacts predicted to remain after any mitigation measures and indicate the methodologies for reaching such conclusions.” The DAR’s approach relies on defining the assessment endpoint for barren-ground caribou as a self-sustaining and ecologically effective population (Table 12.1-1). Assessment endpoints are the qualitative expressions used to assess the significance of effects on VCs and represent the key properties of VCs.

However, given the extent of the decline of the Bathurst herd since 2012, it is questionable whether the Bathurst herd is a self-sustaining and ecologically effective population. It is noteworthy that based on information *preceding* the current collapse, MVEIRB’s Gahcho Kue Panel (2013) had ruled that the Bathurst herd may already be at a threshold where any additional changes have social and cultural significance.

Likewise, the DAR defines the magnitude of effects as depending on whether the amount of change to the measurement indicator is sufficiently large that the resulting range of residual effects are near or exceeding the predicted resilience limits and adaptive capacity of the VC (Table 12 6-1). The evaluation and classification of magnitude considers the adaptive capacity and resilience of caribou to absorb effects from the Project and other disturbances, and continue as a self-sustaining and ecologically effective population. Resilience is the ability of a population to recover or bounce back from disturbance.

Required adequacy item

The accelerated decline of the Bathurst herd since 2012 is unprecedented in caribou management and Dominion needs to discuss the implications and revise the terminology to determine significance. Dominion will provide a revised definition for the assessment endpoint and re-assess the significance of the residual at reproduction, inter-birth interval, age-specific survival rates, lifespan of individuals, habitat selection, and seasonal ranges and migratory behavior. In a population that has declined for a number of years, assumptions about these traits should be described and their implications for resilience and significance of effects re-examined.

8.5 Monitoring

Terms of Reference Section:

7.5 Biophysical environmental monitoring programs and management plans

7.2 Cumulative effects

Appendix B: Guidelines for monitoring and management programs

DAR Sections:

12.7 Follow-Up and Monitoring

17.12 Means to Reduce or Avoid Predicted Cumulative Effects

Adequacy Item rationale

The TOR requires considerable detail on monitoring programs. But the DAR does not clearly present a monitoring framework for proposed monitoring programs or amendments to existing programs and plans to guide Dominion's evaluation of and adaptive management for impacts to caribou. While there is some mention of methods (satellite collars) there is no mention of monitoring objectives, sampling design or thresholds and changes in monitoring relative to detected effects. Sample size is a limitation for the use of the collars especially at the annual scale to measure the Zone of Influence. The DAR only lists tracking migratory movements using satellite radio-collars and aerial reconnaissance surveys for caribou approaching the roads, and road surveys as monitoring for cumulative effects.

TOR Section 7.5	DAR
What parameters (measurement endpoints) will be monitored for changes and how this is related to detection of a significant adverse impact to a valued component	Measurement endpoints not mentioned: instead assessment endpoint (=self-sustaining and ecologically effective population) and measurement indicators
How monitoring data will be used to determine if action is required such as definition of any methodologies used, critical valued, and threshold conditions;	No details presented
How Dominion's proposed mitigation fits into adaptive management plans, including how project management will be adapted	No details presented but mentions the Ekati Mine WEMP which is consistent with GNWT's wildlife and wildlife habitat monitoring guidelines (GNWT-ENR 2013).
Unexpected deviation from environmental assessment predictions for any substance of concern that may impact the valued component	No details presented
A summary table listing all biophysical environmental monitoring and management systems, where they are described in the <i>Developer's Assessment Report</i> , the length of time the monitoring is proposed for, and rationale for each timeline	Missing for caribou
A framework for new plans, or for amendments to existing wildlife related plans	Missing for caribou

Required adequacy item

Please provide a detailed monitoring framework with objectives, sampling design and how results will lead to adaptive management to mitigate incremental and cumulative effects and detect unpredicted effects.

8.6 Cumulative Effects

Terms of Reference Section:

- 7 Assessment of environmental impacts and cumulative effects
- 7.2 Cumulative effects

DAR Sections:

- 17.8 Cumulative Effects Barren-Ground Caribou

Adequacy Item rationale

The TOR required (a) a scenario analysis of relative and potentially important projects in its cumulative effects assessment (b) how Dominion will reduce or avoid any predicted cumulative effects. (c) a description of current efforts towards cumulative effects assessment and management should be described.

The DAR reports limited scenarios for caribou (such as high or low insect harassment or harvesting) but not including scenarios such as continued decline or recovery in caribou abundance or changes in development plans. The DAR predicts that the incremental and cumulative effects will not be significant but uncertainty was high for the reasonable foreseeable project scenario. The DAR does not propose how to reduce the uncertainty. The DAR mentions mitigation but does not detail how mitigation can be intensified to reduce cumulative effects. The description of efforts toward cumulative effects assessment and management does not include approaches applied to other current mines (operational and being assessed).

Required adequacy item

Please address the lack of scenarios and population model especially relative to the recent decline of the Bathurst herd. The DAR should explain how to reduce or address consequences of the uncertainty in the predicted effects for the reasonable foreseeable projects.

Please provide details on monitoring and adaptive mitigation of cumulative effects such as reducing the size of the Zone of Influence, offsetting effects and developing a collaborative adaptive management framework are required together with scenarios for caribou abundance. The framework should specify how the GNWT's Monitoring and Habitat Protection Plan are linked and to Land Use permit conditions and co-management caribou planning. Describe how other mine projects on the Bathurst herd's range will assess and manage cumulative effects and describe how those efforts relate to Dominion's approach. Describe if and how Dominion proposes to work with other mines in the area to cooperatively manage cumulative effects on caribou.

8.7 Effects of 2014 Fires on Caribou Winter Range

ToR section

7.4.3 Impacts to wildlife and wildlife habitat from project components, bullet 8

7.3.3 Impacts to caribou from project components, bullets 3, 5 and 11

DAR section:

12.4.2.1 Habitat Quantity and Fragmentation

Adequacy item rationale

Describing the quantity of existing caribou habitat, this section recognizes that caribou may avoid recent burns, but does not include burn areas from 2014 (par.3, p12-76). Similarly, the winter range resource selection function values on p.12-86 were only updated to 2013, and excluded the

burns of 2014. On p.12-132, the DAR notes that severe fires on winter range may decrease forage availability and lead to declines in caribou recruitment.

The very large scale of the fires of 2014 is well beyond what is shown in table 12.4-8, and may be relevant to the DAR's evaluation of the winter range land cover layer. This may matter to the quality and abundance of winter habitat, the Bathurst herd's condition, energy budget and fecundity, and the vulnerability of the herd.

Required Adequacy Item

Please revise your description of caribou habitat to include the results of the fires of 2014, and incorporate into the DAR any changes this makes to your description of baseline conditions and related potential effects (including energetics) of the Project to the Bathurst caribou herd.

8.8 Caribou mortality and population modelling

ToR section

7.2 Cumulative effects, bullet 3

7.3.3 Impacts to caribou from project components, bullet 11

DAR section:

12.2.2.4 Harvesting and Development

12.3.2.2.2 Secondary Pathways

Adequacy item rationale

Section 12.2.2.4 of the DAR describes Bathurst caribou harvest levels from the Dogrib Harvest Study, resident hunters and non-resident hunters. Page 12-56 describes harvest along the Tibbitt to Contwoyto Winter Road. Both describe the current hunting ban and Aboriginal tag restrictions.

The DAR does not provide information that considers GNWT modelling of overall levels of adult and calf survival including all sources of mortality (such as harvesting, predation, etc.). Mortality from all sources is relevant in describing herd population dynamics and predicting cumulative impacts.

Required Adequacy Item

1. Please update the description of harvest levels to include the *WRRB Barren-Ground Caribou 2012/2013 Harvest and Monitoring Summary*.
2. Please describe overall levels of adult and calf survival (including all sources of mortality) and model the herd population dynamics and demographics.
3. Please describe the levels of uncertainty of the population model, and the implications of that uncertainty. Describe how this relates to the mitigation of cumulative effects on caribou in light of the precautionary principle.
4. Please adjust models and predicted impacts to reflect the revised mortality rates for the herd.

Dominion is encouraged to discuss the above with the GNWT, IEMA and the WRRB while preparing its response.

8.9 Caribou baseline vs background

ToR section

- 4 Assessment methodology
- 5 Description of the existing environment
- 7.2 Cumulative effects, bullet 3

DAR section:

- 12.4.1.2 Assessment cases

Adequacy item rationale

Section 12.4.1.2 of the DAR states that the base case used for the assessment includes cumulative effects from previous and existing developments. Using this as a frame of reference risks minimizing the Project's contribution to cumulative effects because the total cumulative effects (with the project) are not compared to the baseline situation (pre-Ekati). For reviewers to understand the combined effect of the Project and all other human activities on factors such as rates of migratory caribou encountering development, exposure to sensory disturbance and caribou energetics, the *baseline* (pre-Ekati) needs to be separated from the *background* (existing situation). Further discussion of this issue in an aquatic context is provided for item 9.1 below.

Required Adequacy Item

Please provide an assessment of the cumulative effects of the Project by comparing the pre-Ekati caribou baseline with:

- a) The existing conditions resulting from the Ekati and Diavik operations,
- b) The predicted effects of the Project
- c) The effects of reasonably foreseeable future developments.

9 WATER AND AQUATIC LIFE

9.1 Inadequate Cumulative Effects Baseline

Terms of Reference Section:

- 4 Assessment Methodology
- 5 Description of the Existing Environment
- 7.2 Cumulative Effects

DAR Sections:

Volume 6, Section 6.5-2 p. 6-20 Approach to Cumulative Effects Assessment

Volume 6, Section 6.5-2 p. 6-19 Approach to Cumulative Effects Assessment

Adequacy Item rationale

Section 7.2 of the ToR states

“Pursuant to paragraph 117(2) (a) of the MVRMA, the Review Board considers cumulative effects in its determination. Cumulative effects are the combined effects of the development in combination with other past, present, or reasonably foreseeable future developments and human activities. The Jay Project site would sit in an area that has been impacted by past development. In addressing cumulative effects, the developer is encouraged to refer to the Review Board’s Environmental Impact Assessment Guidelines.”

Section 5 of the ToR states

“The data presentation will consider baseline/background conditions, the natural variability of background conditions, and to the extent possible differentiate between natural background conditions, current environmental conditions, and effects from past development activities, such as exploration, the existing Ekati mine operation, or the existing Diavik mine operation.”

Section 4.1 of the ToR states *“compare the predicted impacts to pre-development conditions or to conditions without the Project as appropriate”*

Volume 6, Section 6.5-2 p. 6-20 of the DAR states that “Base Case conditions include the cumulative effects from all previous and existing developments and activities that are approved to take place within the effects study area of a VC. For example, environmental and social effects from the construction and operation of Ekati, Diavik, and Snap Lake mines and the Tibbitt to Contwoyto Winter Road (TCWR) are considered to be part of the existing conditions in the Base Case, if applicable to the VC effects study area. Approved but not yet completed developments, such as the Lynx (Dominion Diamond 2013), Gahcho Kué (De Beers 2010), NICO (Fortune 2011), and Nechalacho (Avalon 2014) projects are also identified for inclusion in the Base Case.”

Volume 6, Section 6.5-2 p. 6-19 of the DAR references the ToR and states that

“Environmental conditions on the landscape prior to human development (e.g., mining, mineral exploration, outfitting, and transportation), which represent reference conditions, were considered independently within the Base Case, where possible (Appendix 1A, Section 4.1).”

The decision to *“...include the cumulative effects from all previous and existing developments.”* in the base case for the cumulative effects assessment does not represent the true baseline for the project as it does not

“differentiate between natural background conditions, current environmental conditions, and effects from past development activities, such as exploration, the existing Ekati mine operation, or the existing Diavik mine operation”, does not “compare the predicted impacts to pre-development conditions”,
and does not provide a rationale for comparison to *“conditions without the Project as appropriate.”*

The proposed cumulative effects assessment therefore starts with any existing effects from the Ekati and Diavik mines and uses this as the baseline upon which any effects of the Jay project will be assessed. This represents a “creeping baseline” as the assessment is based on current conditions with no explicit consideration of the changes that have already occurred over the past 15 years of mining. In this case, there are adequate predevelopment data that can be obtained from the original Ekati EA and the Diavik EA that would describe the environment prior to any significant industrial activity and would provide a better description of the baseline for cumulative effects assessment.

As it is, the absence of a true baseline does not permit a cumulative effects assessment. This is particularly important regarding potential impacts to caribou and to cumulative discharges to Lac de Gras from a) Jay project on Lac de Sauvage, b) Diavik project and c) an additional ten years of discharge via the Slipper Lake drainage from the main Ekati site that will be facilitated via the Jay project.

Required adequacy item

Please provide an assessment of the cumulative effects of the Jay project by comparing the pre-Ekati water quality baseline with:

- d) The existing conditions resulting from the Ekati and Diavik operations,
- e) The predicted effects of the Jay Project
- f) The effects of reasonably foreseeable future developments.

9.2 Significance Determination for Water Quality

Terms of Reference Section:

4.1 Impact Assessment Steps and Significance Determination Factors

DAR Sections:

8.7 Residual Impact Classification and Significance

Adequacy Item rationale

In Annex XVII, the “Traditional Land Use and Traditional Knowledge Baseline Report for the Jay Project”, there are numerous references to the importance of water quality in the Ekati region, including the following three examples:

“The Elders recall the waters of the Ek’ati as being clear and pure. Beside caribou, water is the most important resource to the Dene people. When the Dene travel, they

pay offerings of respect to the water. Water is used for transportation, drinking, fishing, cleaning, and preparing hides and other materials. The YKDFN Elders have said, “the water at Ek’ati is good. It tastes good; we do not have to add anything to make it taste better. It is almost like ice water.” (from Section 3.2.3.1 of Annex XVII)

“Metis have said that Lac de Gras: “has got to be one of the crown jewels of our lake country up here and it’s a major sacrifice to see that degraded.” (section 3.6.3.1 of Annex XVII)

“The Tlicho Elders Committee have stated: “in the past, our elders looked on water as a type of medicine” (TG2012:27). “We depend on the land – animals and water – for life, therefore we do not want anything to be destroyed” (TG2012: 24). “If we wanted water – what will we be drinking? We need to think about this” (TG2012: 27).” (from section 3.7.3.1 of Annex XVII).

On page 8-452, Dominion acknowledges that stakeholders consider surface waters in the area to be of high quality and to taste good; but these attributes are not specifically addressed in the residual impact classifications or the final significance determinations which Dominion defines on page 8-448 as:

“Not significant – impacts are measurable but are not likely to increase the risk to aquatic health and the sustainability of the aquatic ecosystem. Impacts occur at the local scale, and may be strong enough to be detectable at the regional scale.”

“Significant – impacts are measurable at a level such that there is a prolonged exceedance of a screening value (tied to a guideline) that has predicted effects on aquatic health and/or resulting effects to the sustainability of the aquatic ecosystem. A number of high magnitude and irreversible impacts at the regional scale would be significant”

The magnitude criteria for residual impact classifications also do not mention effects to the suitability of the water for drinking or of the inherent importance of water quality in “one of the crown jewels of our lake country”.

Required adequacy item

Please provide a definition for significance that acknowledges potential impacts to the traditional use of surface waters in the area for drinking. This definition should acknowledge the importance of the water to traditional users as per the information presented in Annex XVII. As per section 4.2 of the TOR, if the determination is made that significant adverse effects to the use of water for drinking are not likely, then provide a “narrative statement that identifies what, in its opinion, the threshold for significance would be.”

9.3 Residual Impact Classification and Significance Definition of Criteria

Terms of Reference Section:

4.1 Impact Assessment Steps and Significance Determination Factors

DAR Sections:

8.7 Residual Impact Classification and Significance

Adequacy Item rationale

For water quality, the residual impact criteria are defined in Table 8.7-1 with respect to magnitude, geographic extent, duration, frequency, reversibility and likelihood. These criteria are further described in the text and section 8.7.1.2 describes the relative weight assigned to the criteria in making a significance determination (e.g., magnitude of effect is the primary driver in a significance determination).

Most definitions are clear with the exception of the moderate criteria for magnitude which states, “[m]easurable change in water quality such that the concentrations of some parameters are greater than screening values; however, no effect to aquatic health or to the sustainability of the aquatic ecosystem will occur.”

Based on the text on page 8-444, this criterion must necessarily be evaluated using best professional judgement and this is partially described here. However, no example is given as to how far a screening value could be exceeded without impairing aquatic health and it is difficult to envision a situation in which this criterion would be met or how an objective assessment could be made or how the professional judgement of the proponent could be confirmed.

Required adequacy item

Please provide an example of either predicted or measured results that would meet the criteria proposed for a moderate magnitude of effect for water quality. This example will demonstrate to reviewers how the criterion could or would be met and will be presented with specific guidance on how to interpret values that exceed screening criteria.

9.4 Geographic Scope of the Assessment

Terms of Reference Section:

3.4 Geographic Scope

DAR Sections:

8.1.4.3 Spatial Boundaries Water Quality

Adequacy Item rationale

Section 3.4 of the TOR: Geographic scope: “The geographic scope will include all areas that may be affected by activities within the Jay Project scope of development....The developer will provide rationale for the spatial boundaries it selects for the assessment of potential mine-related impacts on each valued component.”

In Section 8.1.4.3, it states: “Based on the proposed design and associated mitigation of the Project, and the cumulative effects from existing and reasonable foreseeable developments, it is anticipated that changes in water quality will not be measureable at the outlet of Lac de Gras. Thus, setting the limit of the water quality ESA at the outlet of Lac de Gras is reasonable.” However, this is inconsistent with the following:

- a) The residual impact criteria for geographical extent for water quality. The “local” extent definition is only the outlet of Lac de Gras, which is, therefore, equal to the extent of the area assessed for potential impacts. The “regional” and “beyond regional” extent criteria, which extend to the outlet of Desteffany Lake and the mouth of the Coppermine River respectively, cannot actually be evaluated since effects has not been assessed further than the outlet of Lac de Gras;
- b) The assumption that changes to water quality will not be measurable at the outlet of Lac de Gras is not consistent with the predictions presented in section 8.5.4.2.2 or with the impact assessment itself which determines that the geographic extent of the effects to water quality in Lac de Gras will be “local to regional” (table 8.7-2).
- c) Setting the water quality ESA at the outlet of Lac de Gras also confounds interpretation of project-related vs. cumulative effects to water quality as the significance determination excludes explicit consideration of changes in Lac du Sauvage from the Jay project. Adoption of a “Local Study Area” to assess changes to Lac du Sauvage (area of direct effect of the project) and “Regional Study Area” to assess cumulative effects in areas affected by other activities downstream of Lac du Sauvage (Lac de Gras, Coppermine River) would provide a clearer distinction between project related and cumulative effects.

Required adequacy item

Please provide further rationale for setting the Effects Study Area equal to the outlet of Lac de Gras and for not distinguishing project effects from cumulative effects. This rationale will be consistent with the actual effects predicted and with the ability of Dominion to determine the geographic extent of the residual impacts as per the definitions in Table 8.7-1.

9.5 Biophysical Environment

Terms of Reference Section:

5.1, item 13c) Physical and Chemical Makeup of Water Body Sediments

DAR Sections:

8.2.5.3 Sediment Quality Summary
Annex XI Water and Sediment Quality Baseline Report.

Adequacy Item rationale

Section 5.1, item 13c of the TOR: “Physical and chemical makeup of water body sediment in potentially affected water bodies (i.e. from direct or indirect (e.g., aerial deposition including particle size analysis, total metals, dioxins and furans), including baseline concentrations”

In Section 8.8.3, it suggests that water quality at least was measured for dioxins and furans. However, the baseline reports do not show any analysis for these parameters in either water or sediment – except for a mention in Annex XI of the studies on dioxins/furans in sediments in Kodiak Lake as done by Environment Canada.

Dioxins and furans were not measured in sediments sampled by Dominion in preparation for the baseline report.

Required adequacy items

Please provide a rationale why dioxins and furans were not measured in sediments sampled by Dominion for the purpose of understanding baseline conditions for the project.

9.6 Effects Assessment

Terms of Reference Section:

7.1 Effects Assessment

DAR Sections:

Appendix 8F Hydrodynamic and Water Quality Models of Lac du Sauvage and Lac de Gras

Adequacy Item rationale

Maps 8F2.2-1 and 8F2.2-2 are missing in the pdf submission of Appendix 8F making it difficult to understand the results of the analyses.

Required adequacy items

Please provide maps 8F2.2-1 and 8F2.2.

9.7 Permafrost Assumptions

Terms of Reference Section:

5.1.12b Terrain, Permafrost Conditions

DAR Sections:

8.5.4.2.3 Stability of Meromictic Conditions in Misery and Jay Pits After Closure

Adequacy Item rationale

Section 5.1.12b of the ToR requires the developer to “describe the permafrost conditions at the site, including thermal conditions and ground ice/moisture contents of underlying material particularly if maintenance of frozen conditions is required,”

Section 8, p. 8-379 states “the assessment assumes that permafrost will be maintained around the Misery Pit when it is full of water in the absence of a rationale that the thermal mass is not sufficient to develop and maintain a talik.” In addition, it states,

“The saline water stored in the monimolimnion may thaw the permafrost under the base of the Misery Pit, which may be close to the base of permafrost, thereby creating a flow a pathway through the granite rock to the deep groundwater regime and, conceptually, Lac de Gras. However, lateral seepage from the Misery Pit to Lac de Gras would be prevented by permafrost between the pit and Lac de Gras.”

Filling of Misery pit with water may induce formation of a talik over the long term and provide a pathway for high TDS water to flow to Lac de Gras in the deep groundwater system, even if lateral movement from the pit was prevented.

Required adequacy item

Please provide a thermal analysis of the long term stability of permafrost around the Misery Pit at closure and, if the deep groundwater pathway is valid, please include high TDS water from the Misery Pit as a source term to Lac de Gras for the effects assessment.

10 RISK ASSESSMENT AND ACCIDENTS AND MALFUNCTIONS

10.1 Risk assessment - health and safety

ToR section

11 Accidents and Malfunctions, Risk Assessment

DAR section:

Appendix 3C section 1.1 Purpose and Scope

Adequacy item rationale

The (draft) risk assessment in Appendix 3C does not identify any risks to health or safety to humans for the seventeen year period of mine construction, operation and closure. It specifically excludes considering any risks to workers’ health and safety.

Required Adequacy Item

Please conduct a risk assessment using best practices on risks to human health and safety including mine workers. The results should be presented independently and in combination with risks to the environment (for example, using a holistic consequence function integrating health and safety consequences with environmental consequences for a given event).

10.2 Risk assessment – likelihood categories

ToR section

11 Accidents and Malfunctions, Risk Assessment

DAR section:

Appendix 3C section 2.2, Table 7 Risk Measurement and Required Management Actions

Adequacy item rationale

The risk assessment in Appendix 3C defines likelihood categories based on events per year. These categories are important because they are the foundation of the discussions and conclusions in section 4 and 5, and determine which events are carried forward for further consideration and mitigation.

1. The likelihood categories categorized an event that is expected to occur once in ten years as “possible”. However, the project operation phase is ten years, and the construction to post closure is at least 17 years. A one in ten year event is not just possible, it is *likely* to occur in that period. The same table categorizes an event that is expected to occur once in 15 years as “not likely”, even though an event with this return period is in fact *likely* to occur during the project life. No events with this frequency are included in the “expected” category even though they are statistically expected to occur during the Project life.
2. The inclusion of entire orders of magnitude in categories C and D results in categories that are unreasonably broad and do not provide readers with a meaningful understanding of risks. For example, an event with a return period of one in twelve years is likely to occur during the project, but is grouped in the same likelihood category as events with return periods of one in one hundred years. Similarly, category D includes events that have a one in six chance of occurring during the life of the Project in the same group as events that have a one in 50 chance of occurring during the life of the Project.
3. Category B is defined as “possible”. However, this descriptor accurately applies to each event in every category.

Required Adequacy Item

1. Please revise your likelihood categories to reflect probability of events *over the life of the Project*, reevaluating your categories as necessary.
2. Please reclassify category B to a name that does not apply to equally to all other categories.

3. Please divide categories C and D into narrower categories that help to meaningfully describe likelihoods.
4. Please apply the revised likelihood categories to the Failure Modes and Effects Criticality Approach, carrying forward the results throughout the risk assessment and mitigations.

11 MAXIMIZING BENEFITS AND MINIMIZING IMPACTS TO COMMUNITIES

11.1 Non-confidential details about socio-economic agreements

ToR section

8.1.1 bullet 1 Maximizing Benefits and Minimizing Impacts to Communities

DAR section

14.1.3 Socio-Economic Management

Adequacy item rationale

The existing Dominion agreements were outlined and described but not explicitly identified as related to impact benefit agreements (IBAs) or socio-economic agreements (SEAs).

Required Adequacy Item

Please clarify under which agreements the various mitigations fall under.

11.2 Barriers to employment, advancement and retention

ToR section

8.1.1, bullet 1 Barriers to Employment, Advancement and Retention

DAR section

14.1.3 Socio-Economic Management

Adequacy item rationale

Section 14.1.3 of the DAR discusses the "mitigation and benefit enhancement measures in place for the existing Ekati Mine which will be carried over into the Project." While it is appreciated that these measures are and will be beneficial, the barriers and hurdles to be faced for the proposed Project have not been explicitly identified. The barriers and challenges need to be identified in order to determine if the mitigations in place are relevant and adequate.

Required Adequacy Item

Please describe the barriers to employment, advancement and retention, and transportation. In addition, please describe how were these barriers identified and if consideration was given to community engagement and human resources records.

11.3 Effectiveness of past or present socio-economic benefit initiatives

ToR section

8.1.1, bullet 4 Effectiveness of Past or Present Socio-Economic Benefit Initiatives

DAR section

14.1.3 Socio-Economic Management

Adequacy item rationale

The Review Board appreciates that socio-economic initiatives have been undertaken by Dominion; however, additional information is needed to understand and assess the success of these programs.

Required Adequacy Item

Please describe the success of programs both qualitatively and quantitatively. Please include, at a minimum, a summary table with: the proportion of Aboriginal employees, northern employees, employee retention/turnover, male to female ratio, and Aboriginal advancement by year. The table should provide annual data back to the beginning of mining and indicate the timing of the socio-economic initiatives.

11.4 Collaboration with communities to address potential social impacts

ToR Section

8.1.1, bullet 14 and 16 Collaboration with Communities

DAR Section

14.1.3.5 Health and Well-being

14.6 Health and Well-being

Adequacy item rationale

The DAR describes the existing social issues and the potential project effects on community well-being. In addition, Dominion outlined existing programs in place. The inclusion of community engagement in establishing the existing programs, identifying the community concerns, and how community collaboration will be used moving forward to establish new programs and determine the success of programs has not been discussed.

Required Adequacy Item

Please describe the specific means of collaboration to identify and address social issues.

11.5 Current and proposed initiatives to address potential social impacts

ToR Section

8.1.1, bullet 15 Initiatives to Address Social Impacts

DAR Section

14.6 Health and Well-Being

Adequacy item rationale

The purpose of identifying current and proposed initiatives is firstly, know what they are, secondly, assess whether they address the potential social impacts, and finally gain an understanding of the success of the programs. There is not enough information in the DAR to address these three items.

Required Adequacy Item

Please describe the success of Dominion's social programs, either quantitatively or qualitatively. In addition, please identify if there are any additional programs planned.