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CLOSING SUBMISSION

Jay Project

EA1314-001



**Submitted to the
Mackenzie Valley
Environmental Impact
Review Board**

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EXECUTIVE SUMMARY

The Agency's conclusions on the significance of the Jay Project impacts have been updated based on new information that was received after the filing of our Technical Report in July 2015. In some cases, the Agency has been satisfied with the commitments made by DDEC or believes that remaining issues can be dealt with through the regulatory process. In other cases we have retained or refined the proposed Measures and Suggestions. The Agency has also proposed two new Measures.

Our most important issues are finding ways to reduce the impacts of the Jay Project on the Bathurst caribou herd which has declined a lot, and making sure that the water released by the Jay Project is safe for Lac du Sauvage by ensuring there are good plans in place if predictions are not accurate. We are also concerned about the new approach to the Jay Project waste rock pile and whether it will freeze. Dust from Jay Project traffic is also an issue we believe needs careful attention.

Although the DDEC believes that the impacts of the Jay Project are not significant, the Agency is of the view that there is a lot of uncertainty around some of the predictions, a lack of details on some monitoring programs to detect changes, and the need for better plans to take actions when monitoring results give early warning signs of potential problems. The Agency believes that Measures are required to prevent a significant adverse impact to the environment from the Jay Project.

We believe the Review Board should recommend Measures to the Responsible Ministers to require:

- DDEC make the Jay Project environmental footprint as small as possible by choosing road routes carefully, better dust control, and make the esker crossing as small as possible, and using advice from an expert panel;
- DDEC, with other partners, research the causes of the zone of caribou avoidance of the Ekati Mine and take action to reduce the size of that zone for the Jay Project;
- DDEC conduct caribou surveys to calculate the zone of avoidance around the Jay Project on an annual basis to measure the effectiveness of its caribou protection measures;
- DDEC work with others to prepare a plan to compensate for or offset the impacts to caribou from the Jay Project, with an expert panel to help assess whether the actions are working or not;
- GNWT-ENR use its authority under the *Wildlife Act* to require existing developments to reduce impacts on the Bathurst herd;
- DDEC prepare a plan to manage water from the Jay Project that includes detailed options if predictions are not accurate or if there are early signs of potential problems;
- DDEC develop an early warning system of impacts from wastewater on zooplankton and plankton communities and how those changes may affect fish;
- DDEC prepare detailed plans for monitoring, management and options to manage problem drainage from the Jay waste rock pile with early warning signs and distances from water bodies;
- DDEC revise its air emissions and dust plan to set levels that result in specific actions to reduce dust and other air pollution;
- DDEC include monitoring of dust, snow and lichen in the areas most likely to be affected by the Jay Project air pollution;
- DDEC revise its incinerator management plan to ensure proper monitoring with early warning signs of potential problems; and
- DDEC and others to whom Measures and Suggestions have been directed, report annually and publicly on what progress has been made.

1.0 INTRODUCTION

1.1 Organization of the Closing Submission

The Agency is pleased to present our closing submission on the Dominion Diamond Ekati Corp. (DDEC) Jay Project. We carefully reconsidered all of the proposed Measures and Suggestions from the Agency's Technical Report ([PR#498](#)), in light of DDEC responses to Technical Reports (Response to Agency Technical Report [PR#556](#)), the arguments and evidence we heard during the public hearing, and a review of the responses to undertakings from the public hearing.

As with our Technical Report, we have chosen to focus on the most important issues and concerns, in line with the Key Lines of Inquiry and Subject of Note as follows:

- Caribou;
- Water and Fish;
- Waste Rock and Seepage Management; and
- Air Quality and Dust.

For each of these topics we present the Measures and Suggestions as proposed in our Technical Report. Our conclusions on the significance of the Jay Project impacts related to each topic are then updated based on views and evidence that were received after the filing of our Technical Report in July 2015. In some cases, the Agency has been satisfied with the commitments made by DDEC or believes that residual issues can be adequately dealt with through the regulatory process. In other cases we have retained or refined the proposed Measures and Suggestions. Based on the evidence obtained through the public hearing and a response to an undertaking, the Agency has proposed two new Measures to prevent an adverse environment impact from the Jay Project.

The Agency reviewed its process observations from our Technical Report and continues to offer a Suggestion and a Measure to ensure sound follow-up from this environmental assessment and better engagement in future assessments.

References in this Closing Submission are to the documents filed on the Public Registry using the numbers assigned by the Review Board (e.g. [PR#74](#) Terms of Reference). No new evidence has been introduced.

2.0 CARIBOU

As has been underscored throughout the Jay Project environmental assessment process (Tlicho Government Technical Report [PR#531](#), Yellowknives Dene First Nation Technical Report [PR#520](#), Lutsel K'e Dene First Nation Technical Report [PR#521](#), and NSMA Technical Report [PR#522](#)) and especially during the final hearings in Yellowknife, Behchokò and Lutsel K'e (Public Hearing Transcripts Day Two on Caribou [PR#644](#), Public Hearing Transcripts Behchoko [PR#647](#), Public Hearing Transcripts Lutsel K'e [PR#646](#)), caribou are an essential part of Aboriginal peoples' culture, language, and way of life. The precarious state of the Bathurst caribou herd and the location of the Jay Project in an important area for caribou post-calving, summer and fall habitat and migration are of particular concern for the Agency and others. In our Technical Report ([PR#498](#)), we argued that there is an existing significant adverse (cumulative) impact on the Bathurst caribou herd and, taking a precautionary approach, recommend that the Review Board make a determination that there would be a significant adverse cumulative impact of the Jay Project on the Bathurst caribou herd pursuant to s. 128(1)(b) of the *Mackenzie Valley Resource Management Act (MVRMA)*. The Agency suggested measures that covered three main areas: design options that limit the physical and ecological footprint of the Jay project, caribou mitigation measures, and means of offsetting potential impacts. These are all matters (Terms of Reference, s.7.3.3 Impacts to caribou from project components [PR#74](#)) relevant to adaptive management and cumulative effects management in relation to significant adverse (cumulative) impacts from the Jay Project on caribou.

2.1.1 Original Measures

Measures related to caribou as contained in the original Agency Technical Report ([PR#498](#)) follow:

Measure 1:

To prevent a significant adverse impact to caribou, DDEC shall implement further measures minimize the ecological disturbance footprint for the Jay Project as follows:

- selection of the Jay haul road route that minimizes disturbance to high quality caribou habitat ([PR#305](#) DAR-IEMA-IR-28 and [PR#356](#) Anne Gunn's proposed routing);
- additional mitigation to reduce the effect of haul truck and other traffic on caribou (e.g., more rigorous dust management, including adaptive management triggers for additional dust suppression; more precautionary traffic management to reduce sensory disturbance); and

- investigate and implement an esker crossing that involves selection of less critical habitat, one-way traffic, buried power lines, and other innovative approaches.

Measure 2:

To prevent a significant adverse impact to caribou, DDEC, with other mine operators and GNWT where possible, shall develop and implement a collaborative research program designed to identify the causes of the Zone of Influence (ZOI) for caribou avoidance. The research findings will then be implemented to reduce the size of the ZOI on caribou. The results of the research program are to be summarized and reported annually to all interested parties as part of DDEC's annual report under its Wildlife Effects Monitoring Program. A target date for development of the research program is one year following the acceptance of the Measures by Responsible Ministers and implementation of the research results to reduce the ZOI within five years. DDEC shall commit to using the results of the research for the existing Ekati Mine.

Measure 3:

To obtain information needed to prevent a significant adverse impact to caribou, DDEC shall analyze estimates of ZOI distance and magnitude from the 2009 and 2012 aerial survey data from the combined Ekati-Diavik study area using the new R code analysis. These estimates should be reported within the 2015 Wildlife Effects Monitoring Program report.

Measure 4:

To obtain information needed to prevent a significant adverse impact to caribou, DDEC shall undertake aerial surveys to monitor relative caribou distribution and abundance and measure the effectiveness of mitigation measures for caribou currently in use for Ekati and proposed for the Jay Project. The aerial survey study area should be enlarged to include the extensions related to the proposed Jay Project and reasonably foreseeable Sable footprints. Given new analytical techniques, survey timing will be established in collaboration with interested parties but designed to track trends over time. DDEC shall produce estimates of ZOI distance and magnitude for the Jay Project (including the entire Ekati Mine) for the combined Ekati-Diavik study area using the new R code analysis. The

results of the aerial surveys and analysis of the ZOI are to be reported annually (as appropriate) as part of DDEC's Wildlife Effects Monitoring Program reports, and will serve as means of measuring the effectiveness of Jay Project caribou mitigation measures.

Measure 5:

To prevent a significant adverse impact to caribou and to reduce public concern with the Jay Project, DDEC shall prepare a Compensatory Mitigation (Off-Setting) Plan for caribou. The purpose of the Plan is to enhance the ability of the Bathurst caribou herd to recover to its previous abundance as measured through reductions in energy loss, positive changes in calf production and survival. To the extent possible, the Plan should be developed collaboratively with interested parties, and shall be a condition of a land use permit for the Jay Project. The Plan should be prepared and circulated by DDEC to the Wek'eezhii Renewable Resources Board, GNWT and affected Aboriginal governments within one year of the acceptance of the Report of Environmental Assessment and shall be in place before construction commences on the Jay Project.

2.1.2 Agency's Updated Conclusions

DDEC responded to the Agency's recommendations in its formal response (DDEC's Response to the Agency's Technical Report [PR#556](#)), during the public hearings (Public Hearing Transcripts Day Two on Caribou [PR#644](#)), and especially in response to Undertaking #6 (DAR-MVEIRB-UT2-06 [PR#677](#)), largely derived with input from a workshop held on 1 October 2015 (Workshop Summary [PR#674](#)) that covered caribou mitigation and offsetting. The Agency's suggestions to address increased or enhanced caribou mitigation and offsetting to reduce cumulative impacts of the Jay Project on the Bathurst caribou were provided in response to Undertaking #9, distributed three days prior to the 1 October workshop ([PR#655](#)). Although DDEC has stated that there will be a small residual effect from the Jay Project (DAR-MVEIRB-UT2-06 [PR#677](#)), it does not accept that there will be a significant adverse impact to caribou as a result of the Project (DDEC's Response to the Agency's Technical Report, Section 2.1, pg. 2-2 [PR#556](#)). DDEC has committed to prepare a Caribou Mitigation Plan within one year of acceptance of the Report of Environmental Assessment, stating that this Plan will contain Project mitigation, details on financial support for research and offsetting, enhanced dust suppression, and accelerated progressive reclamation; some details are provided in DAR-MVEIRB-UT2-06 (DAR-MVEIRB-UT2-06, pgs. 2-8 [PR#677](#)).

In response to Undertaking #6 (DAR-MVEIRB-UT2-06, pg.3 [PR#677](#)), DDEC has committed to some additional Project traffic mitigation and lower thresholds to trigger enhanced mitigation beyond what was originally proposed in the July 2015 Caribou Road Mitigation Plan ([PR#518](#)) on reaction of traffic to caribou at different distances. While the Agency appreciates these changes, we contend that given the current precipitous decline of the Bathurst herd these mitigations do not go far enough to adequately eliminate sensory disturbance and reduce deflections from the Project. Indeed, for northern migration the July 2015 CRMP (pg. 3-10 [PR#518](#)) states that “short-term closures will occur when groups [one or more caribou] are within 500 m of the roads”, but Response to DAR-MVEIRB-UT2-06 ([PR#677](#)) now states at 300-500 m from the road, speed limit is lowered to 40 km/h, and traffic will only be stopped if “the path of caribou movement is anticipated to intersect the Jay or Misery road” (DAR-MVEIRB-UT2-06, pg.3 [PR#677](#)). This appears to be less cautionary than the original mitigation laid out in the July 2015 CRMP. Specific measures proposed by the Agency are provided in DAR-MVEIRB-UT2-09 (pgs. 1-5 [PR#655](#)).

DDEC has offered limited further steps to convince communities and other concerned parties that the ecological disturbance footprint for the Jay Project will be minimized. Although an alternative road dust suppressant is currently being tested (and looks promising) and there is a commitment to implement these measures if successful (DAR-MVEIRB-UT2-06, pgs. 4-5 [PR#677](#)), a dust management best practises document is still lacking, as is an explicit commitment to reducing road, LLCF and other fugitive dust deposition at Ekati. Sensory disturbance from truck traffic could be further reduced by more protective traffic management (as detailed in the Agency’s response to DAR-MVEIRB-UT2-09 pgs. 1-5 [PR#655](#)). Many of the mitigation measures proposed by DDEC relate to changes in habitat (e.g., accelerated Long Lake Containment Facility (LLCF) reclamation and construction of wildlife egress ramps on the Waste Rock Storage Areas (WRSAs); DAR-MVEIRB-UT2-06, pgs. 6-7 ([PR#677](#)) or research into factors (e.g., the ZOI and dust suppression; DAR-MVEIRB-UT2-06, pgs. 3-5 [PR#677](#)) that may realize benefits or change mitigation 4-5 years or more into the future. Moreover, since these measures were planned anyway, the benefit compared to doing them sooner rather than later will be relatively short-lived. Since the current vulnerability of the Bathurst herd is very high, measures should be considered that will provide more immediate returns to reduce current impacts on caribou.

The Agency believes that additional emphasis should be placed on immediate reductions in sensory disturbance related to vehicle traffic and caribou movements. These could include ensuring predictable breaks in the traffic (via conveying or systematic breaks in traffic – perhaps 20 minutes every 2 hours – when more than 10 caribou are known to be present within 500 m of the road alignments) to encourage

those caribou who are trying to cross the road to actually make their move; planned stoppage times when traffic is halted at threshold distances from the roads (as detailed in DAR-MVEIRB-UT2-09: Table 1 [PR#655](#)); heightened detection monitoring of caribou on the Misery esker with halts in traffic when triggered; and regulations governing blasting when caribou are in the vicinity.

To address Zone of Influence research, DDEC has committed to provide funds to purchase and deploy geofencing collars in 2017 and 2018, and to fund the ZOI Technical Task Group to review these collar data in 2018 and 2019, “to help increase the accuracy and precision of the ZOI, and determine the behavioural response of caribou to the Jay and Misery roads and Ekati Mine facilities” (DAR-MVEIRB-UT2-06, pgs.3-4 [PR#677](#)). While certainly helpful to GNWT-ENR’s caribou program efforts and of benefit to understanding fine-scale movements near mine infrastructure, this funding does not address the need for a comprehensive research program to identify the causes of the ZOI for caribou avoidance. In addition, no commitments have been made by DDEC to implement enhanced mitigation measures or to monitor the effects of any enhanced mitigation on the caribou ZOI. The Agency re-iterates that aerial surveys should be conducted to monitor the impact of the Jay Project and measure the effectiveness of mitigation measures for caribou, including enhanced traffic management and dust deposition.

DDEC has committed to apply enhanced mitigation measures from the Jay Project to the entire Ekati mine site, which will provide a degree of offset to existing and future impacts on the Bathurst herd. The Agency states emphatically that “financial offsetting” (DAR-MVEIRB-UT2-06, pgs.3-4 [PR#677](#)), especially that aimed at funding geofencing collars, is not offsetting unless the findings of the research are applied to mitigation to reduce impacts – the link from that is not clearly stated. Similarly, research is not mitigation (again, unless the results of the research are explicitly used in altered and improved mitigation), and the dollar value of funding for research does not equate to the value of the research to reduce impacts, especially when there are no proposed methods to measure offsets or other benefits to the Bathurst caribou herd.

The Agency’s Measure 5 requested that DDEC prepare a Compensatory Mitigation (Off-Setting) Plan for caribou (Agency Technical Report, pg. 12 [PR#556](#)). DDEC has committed to offset impact of the Project by implementing the CRMP on an Ekati-wide basis (DAR-MVEIRB-UT2-06, pg.5 [PR#677](#)). Other than some enhanced traffic mitigation (noted above) and an additional commitment to implement a successful dust suppression pilot project on all roads at the Ekati Mine site (DAR-MVEIRB-UT2-06, pg.5 [PR#677](#)), there is no tangible offset plan or design proposed in DDEC’s plan. DDEC has also not attempted to predict the quantitative value of any of its proposed offsets,

especially in relation to the predicted impact of the Jay Project on the Bathurst caribou herd based on its energetics modelling. Dust deposition has been linked to the caribou Zone of Influence (Public Hearing Transcripts Day Two on Caribou, pgs. 380-381 [PR#644](#)), and the Agency would have preferred to see a clear commitment to reduce road, LLCF and other fugitive dust deposition from Jay and across the entire Ekati Mine with specific targets and a timetable, something we have been pushing for over many years. The reductions should be measureable, reported and linked to other efforts to reduce the Zone of Influence.

While application of any changes in dust suppression and traffic management from the Jay Project to the entire Ekati mine is considered offsetting of impacts from the Jay Project, the Agency would like to think that DDEC would have instituted these measures regardless of Jay, especially in light of the current status of the Bathurst herd. There is no evidence that past and current mitigation measures addressing sensory disturbance and displacement have actually had any effect on the caribou ZOI – up until the last data available from 2008 the ZOI was stable in distance and increasing in magnitude, despite ongoing mitigation throughout the 2000s. The Agency suggests that the Sable Project can be one area where DDEC can offset the impacts of the Jay Project. DDEC could delay the Sable Project or institute winter-only mining to reduce sensory disturbance and dust generation until the Bathurst caribou herd begins to recover. This would be a concrete demonstration of DDEC's commitment to offset the impacts of the Jay Project.

During the 1 October 2015 offsetting workshop, there was discussion of the need to monitor, evaluate and measure any offsetting to ensure the effectiveness of any mitigation measures and actions, and to then adjust or change strategies in an adaptive management framework. In response to a request from MVEIRB to GNWT-ENR to review the status of previous environmental assessment measures related to the Bathurst caribou herd, ENR was unable to adequately evaluate the effectiveness of the many measures (GNWT-ENR EA Measures Letter [PR#678](#)) from previous environmental assessments. Many of the measures had been partially implemented, or had been “implemented to the extent possible at this point in the Project life” (GNWT-ENR EA measures letter [PR#679](#)). The Agency proposed, and still supports, appointment of an expert panel to assist with the implementation of an offset plan and measurement of its effectiveness. This should not be construed as demeaning in any way to the ENR expertise. It only is needed because of our collective limited understanding of Bathurst herd ecology and the herd is now in a precarious state. The very best expertise should be applied to ensure the effectiveness of mitigation and offsetting for the Jay Project and to assist DDEC and ENR with adjustments to caribou

mitigation, to ensure measureable benefits or improvements for the Bathurst caribou herd.

2.1.3 Updated Measures

Given the reasoning presented in the Agency's Technical Report (Agency Technical Report, Section 3.1.4, pgs. 2-4 [PR#556](#)), and the discussion above, the Agency recommends that the Review Board should take a precautionary approach and make a determination that there would be a significant adverse cumulative impact of the Jay Project on the Bathurst caribou herd. The precautionary approach, in this context, the Agency construes to mean that we assume the effect is caused (in part) by the cumulative impact of existing (and past) human activities in the region (Bathurst caribou range) when combined with the impacts from the proposed Jay Project, and the Developer and responsible government agencies should respond accordingly. Following are updated caribou-related Measures that the Agency recommends should be adopted.

An amended version of Measure 1 from the Agency's Technical Report ([PR#556](#)):

Measure 1:

To prevent a significant adverse impact to caribou, DDEC shall implement further measures to minimize the ecological disturbance footprint for the Jay Project as follows:

- selection of the Jay haul road route that minimizes disturbance to high quality caribou habitat ([PR#305](#) DAR-IEMA-IR-28 and [PR#356](#) Anne Gunn's proposed routing);
- additional mitigation to reduce the effect of haul truck and other traffic on caribou (e.g., a dust management best practices document with adaptive management triggers for additional dust suppression; more precautionary traffic management to reduce sensory disturbance such as greater use of convoys and scheduling breaks in traffic); develop rules for blasting to reduce sensory disturbance;
- investigate and implement an esker crossing that involves selection of less critical habitat, one-way traffic, buried power lines, remote sensory devices, and other innovative approaches; and
- fund a panel of experts (beyond those involved in the current assessment and review) to help better design and monitor the results of the Jay Project infrastructure, including the crossing of the Misery esker system.

Measure 2 from the Agency's Technical Report ([PR#556](#)) is retained:

Measure 2:

To prevent a significant adverse impact to caribou, DDEC, with other mine operators and GNWT where possible, shall develop and implement a collaborative research program designed to identify the causes of the Zone of Influence (ZOI) for caribou avoidance. The research findings will then be implemented to reduce the size of the ZOI on caribou. The results of the research program are to be summarized and reported annually to all interested parties as part of DDEC's annual report under its Wildlife Effects Monitoring Program. A target date for development of the research program is one year following the acceptance of the Measures by Responsible Ministers and implementation of the research results to reduce the ZOI within five years. DDEC shall commit to using the results of the research for the existing Ekati Mine.

Measure 3 from the Agency's Technical Report ([PR#556](#)) has been withdrawn. DDEC has committed to enable mine aerial survey data from 2009 and 2012 to be used to determine the annual Zone of Influence distance and magnitude (Commitment Table pg. 25 [PR#681](#)), removing the need for Measure 3 from the list provided in the Agency's original Technical Report. The Agency is satisfied with DDEC's commitment.

Measure 4 from the Agency's Technical Report ([PR#556](#)) is retained and renumbered.

Measure 3:

To obtain information needed to prevent a significant adverse impact to caribou, DDEC shall undertake aerial surveys to monitor relative caribou distribution and abundance and measure the effectiveness of mitigation measures for caribou currently in use for Ekati and proposed for the Jay Project. The aerial survey study area should be enlarged to include the extensions related to the proposed Jay Project and reasonably foreseeable Sable footprints. Given new analytical techniques, survey timing will be established in collaboration with interested parties but designed to track trends over time. DDEC shall produce estimates of ZOI distance and magnitude for the Jay Project (including the entire Ekati Mine) for the combined Ekati-Diavik study area using the new R code analysis. The results of the aerial surveys and analysis of the ZOI are to be reported annually (as appropriate) as part of DDEC's Wildlife Effects Monitoring Program reports, and will serve as means of measuring the effectiveness of Jay Project caribou mitigation and offsetting measures.

Measure 5 from the Agency's Technical Report ([PR#556](#)) is amended and renumbered.

Measure 4:

To prevent a significant adverse impact to caribou and to reduce public concern with the Jay Project, DDEC shall prepare an Offset Mitigation Plan for caribou. The purpose of the Plan is to enhance the ability of the Bathurst caribou herd to recover to its previous abundance as measured through reductions in energy loss, and positive changes in calf production and survival. The Plan should contain a suite of concrete offset measures, such as delays or phasing in other activities in the claims block including the Sable Project, or scheduling winter-only operations at the Sable and/or Jay Projects. The Plan should include means to evaluate the effectiveness of the measures. To the extent possible, the Plan should be developed collaboratively with interested parties, and shall be a condition of a land use permit for the Jay Project and in compliance with s. 95 of the *Wildlife Act*. The Plan should be prepared and circulated by DDEC to the Wek'eezhii Renewable Resources Board, GNWT, Independent Environmental Monitoring Agency (IEMA) and affected Aboriginal governments within one year of the acceptance of the Report of Environmental Assessment and shall be in place before construction commences on the Jay Project. Offset measures should be reported on annually and evaluated by ENR, the Agency, community governments, and an independent expert panel, membership of which could be named by ENR, DDEC and the IEMA, and funded by DDEC. Based on this evaluation, the Plan should be adaptively managed annually to ensure its adequacy in offsetting impacts of Jay.

A new Measure is recommended to reduce the cumulative impacts to the Bathurst caribou herd. Offsets to reduce cumulative impacts to the Bathurst herd can be addressed by other developments within the Bathurst herd range (cumulative impacts require cumulative solutions). ENR has the authority under the *Wildlife Act* to require Wildlife and Wildlife Habitat Protection Plans (s. 95 of the *Wildlife Act*) from existing developments under certain conditions, such as cumulative effects on a significant number of wildlife. This should be one action in a suite of measures to offset impacts from development to the Bathurst herd. This would also support improved implementation of Measures from previous environmental assessments.

Measure 5:

To prevent a significant adverse impact to caribou and to reduce public concern with the Jay Project, ENR use its authority under the *Wildlife Act* to require Wildlife and Wildlife Habitat Protection Plans (s. 95 of the *Wildlife Act*) from existing developments to reduce impacts on the Bathurst herd.

3.0 WATER

3.1 Surface Water and Minewater Management

3.1.1 Original Measure

Measure 6:

To prevent a significant adverse impact to water quality, DDEC shall develop and submit to the Wek'eezhii Land and Water Board (WLWB) for approval, a revised Water Management Plan (WMP) for the Jay Project within two years of initiating de-watering operations of the Jay Pit. The Plan shall include:

- Identification of specific surface and minewater management contingencies including capacities (in terms of effluent volumes and mine production as expressed in operating days);
- Design, construction and implementation timing for each identified surface and minewater management contingency option;
- Detailed monitoring of water quality and quantity to enable early detection of success or failure; and
- Associated adaptive management trigger thresholds for the implementation of contingencies.

3.1.2 Agency's Updated Conclusions

In its response to the Agency's Technical Report for the Jay Project ([PR#556](#)), DDEC accepted the recommendation that a revised WMP be submitted to the WLWB. DDEC further committed that the revised WMP will include "details of contingencies, monitoring and evaluation, adaptive management trigger thresholds and timelines for implementation".

The Agency is largely satisfied with DDEC's response. However, it is noted that DDEC's response did not acknowledge or address the recommendation that the WMP address the lead time required for the 'design and construction', along with implementation of any contingencies should water quality of discharges prove to have an adverse impact or are predicted to exceed thresholds or standards.

The amount of time required to design and construct a surface water and minewater contingency could be significant, depending upon the specific contingency. The Agency believes the explicit inclusion of this critical planning aspect is needed to help ensure DDEC is prepared to successfully implement the eventual WLWB-approved WMP in the event a stable meromixis condition fails to be established, or is interrupted, in the Misery

Pit. While the Agency recognizes that DDEC has committed to prepare a detailed WMP and that there is a rigorous regulatory process for water licencing, we remain of the view that it is necessary to retain the original Measure 6 that was proposed in our Technical Report. There are still major concerns and considerable uncertainties with regard to the establishment and maintenance of meromixis in the Misery and Jay pits. Given the importance of water quality and possible severity of poor water quality for downstream users and aquatic life, it is essential to ensure there is strong guidance on how contingency planning should take place.

3.1.3 Updated Measure

Measure 6 from the Agency's Technical Report ([PR#556](#)) is amended to reflect the need for adequate lead times.

Measure 6:

To prevent a significant adverse impact to water quality, DDEC shall develop and submit to the Wek'eezhii Land and Water Board for approval, a revised Water Management Plan for the Jay Project within two years of initiating de-watering operations of the Jay Pit. The Plan shall include:

- Identification of specific surface and minewater management contingencies including capacities (in terms of effluent volumes and mine production as expressed in operating days);
- Design, construction and implementation timing for each identified surface and minewater management contingency option with sufficient lead times for design, construction and implementation;
- Detailed monitoring of water quality and quantity to enable early detection of success or failure; and
- Associated adaptive management trigger thresholds for implementation of contingencies.

3.2 Mercury Contamination

3.2.1 Original Measure

Measure 7:

To prevent a significant adverse impact to water quality, DDEC shall provide specific details to the Wek'eezhii Land and Water Board as part of any proposed water licence, as to how it plans to encapsulate mercury-laden lakebed sediments within the Jay WRSA to ensure mercury does

not re-enter the Lac du Sauvage water column during operations and closure.

3.2.2 Agency's Updated Conclusions

The Agency consideration of the issue of mercury contaminated sediment storage within the Jay waste rock pile has been moved to s. 4.1.2 below in this Closing Submission.

3.3 Lac du Sauvage Fish Monitoring

3.3.1 Original Measure

Measure 8:

To prevent a significant adverse impact to fish likely to be affected by the Jay Project, DDEC shall incorporate non-lethal testing of large-bodied fish within Lac du Sauvage in any Aquatic Effects Monitoring Program for the Jay Project.

3.3.2 Agency's Updated Conclusions

DDEC did not agree with the Measure proposed by the Agency in its response to our Technical Report (DDEC Response to Agency Technical Report, pg. 2-11 [PR#556](#)). The Agency does not support DDEC's rationale for not conducting sampling of large-bodied fish to effectively manage aquatic impacts of the Jay Project. However, we are of the view that there will be a thorough and rigorous review of an Aquatic Effects Monitoring Program, including fish sampling, as part of the water licencing of the Jay Project, therefore will not pursue this matter further at this stage.

3.3.3 Updated Measure

The Agency does not believe it is necessary to retain Measure 8 at this time.

3.4 Impacts on Fish Habitat from Dust Deposition

3.4.1 Original Measure

Measure 9:

To support DDEC's position that dust settling on spawning shoals would be naturally swept away, DDEC shall develop and submit to the Wek'eezhii Land and Water Board the results of a model of depth of wave turbulence

below the surface in Lac du Sauvage in areas likely to be affected by dust deposition from the Jay Project.

3.4.2 Agency's Updated Conclusions

DDEC did not accept the Measure proposed by the Agency in its response to our Technical Report (DDEC Response to Agency Technical Report, pg. 2-11 to 2-13 [PR#556](#)). It is not clear to the Agency how lake currents would clear sediment from shoals in Lac du Sauvage, including interstitial spaces in gravel where lake trout and/or whitefish eggs and alevins may be found. This uncertainty, in combination with the outstanding question of whether Lac du Sauvage trout and whitefish populations are isolated from Lac de Gras (GNWT Technical Report Appendix, pg. 20-22 [PR#514](#)), the Agency remains concerned that the Jay Project may have the potential to cause an adverse impact on Lac du Sauvage fish production. However, the Agency is of the view that the water licencing of the Jay Project should provide adequate opportunities to pursue this issue, therefore will not pursue this matter further at this stage.

3.4.3 Updated Measure

The Agency does not believe it is necessary to retain Measure 9 at this time.

3.5 Jay Project Impacts on AEMP Reference Lakes

3.5.1 Original Measure

Measure 10:

DDEC shall evaluate the Jay Project impacts on Counts Lake as an AEMP reference lake and identify alternative lakes which could be used as reference lakes in the AEMP, or a means of continuing to use Counts should that be a better option, for the Jay Project before construction begins.

3.5.2 Agency's Updated Conclusions

DDEC only committed to monitoring changes in Counts Lake water chemistry, which it already does annually in the current AEMP (DDEC Response to Agency Technical Report, pg. 2-13 [PR#556](#)). DDEC acknowledged that there may be an increase in Total Suspended Particulates (TSP) in Counts Lake as a result of Jay-generated dust deposition. DDEC does not appear to have evaluated whether this elevated TSP would interfere with Counts Lake's ability to reflect a typical reference lake condition. This is important in that the current Ekati Aquatic Effects Monitoring Program has Counts Lake

serving as a reference lake to gauge water quality changes in lakes downstream of the LLCF.

Also, in considering the monitoring of impacts to Lac du Sauvage itself, the Agency believes it would be of benefit for DDEC to present to the Wek'eezhii Land and Water Board (WLWB) a list of possible alternative reference lakes that the company is considering. This would help to give the WLWB a greater understanding of what biophysical characteristics DDEC is considering in comparing Lac du Sauvage to comparable lake(s) unaffected by mining.

3.5.3 Updated Measure

While DDC's response to this issue is not entirely adequate, the Agency does not believe it is necessary to retain Measure 10 at this time. Should the Jay project be approved, the subsequent water licencing process should provide adequate opportunities to pursue this issue.

3.6 Effluent Toxicity to Zooplankton within Mixing Zone

3.6.1 Original Measure

Measure 11:

To prevent a significant adverse impact to zooplankton from the Jay Project, DDEC shall evaluate the likelihood of acute toxicity to zooplankton occurring in the proposed mixing zone during operations. DDEC should also commit to reviewing the QA/QC of all future chronic and acute toxicity testing to ensure comparability of results to natural conditions in the receiving environment (i.e. use of water in toxicity testing that has the same temperature and other physical properties as water within the receiving environment).

3.6.2 Agency's Updated Conclusions

DDEC has committed to discharge effluent that is not acutely toxic to aquatic into Lac du Sauvage (DDEC Response to Agency Technical Report, Section 2.9.2 [PR#556](#)). DDEC has not predicted the chronic or sub-lethal effects of its proposed effluent discharge into Lac du Sauvage on fish or plankton within the mixing zone (DDEC Response to GNWT IR #2-04, pg. 37-41 [PR#448](#)). However, GNWT has noted that by year 10 of the Jay Project, dissolved solids in effluent will likely reach a level toxic to aquatic organisms (GNWT Technical Report, pg. 20 [PR#515](#)). The Agency is of the view that discharge of acutely toxic effluent from Jay into Lac du Sauvage at the diffuser would constitute a significant adverse impact and would likely be in violation of the

Fisheries Act. It is not clear what measures or mitigation DDEC intends to undertake to prevent acutely toxic effluent from being discharged into Lac du Sauvage.

We appreciate that DDEC has committed to maintaining a complete Quality Control and Quality Assurance system for all its toxicity testing for aquatic life including a commitment to investigate the feasibility of using laboratory procedures that reflect site-specific conditions (DDEC Response to Agency Technical Report, Section 2.9.2 [PR#556](#)). The Agency recommends that the company use zooplankton species in its toxicity testing that reflect those that long-term AEMP trends show to be in significant decline (such as *Holopedium* whose populations in impacted Ekati lakes have been shown to be declining while populations of the standard test genus *Daphnia* in those same lakes have not.).

3.6.3 Updated Measure

Measure 11 from the Agency's Technical Report ([PR#556](#)) is amended and renumbered as follows:

Measure 7:

To prevent a significant adverse impact to aquatic life in Lac du Sauvage from Jay Project effluent, DDEC shall develop a rigorous Aquatic Response Framework that includes early warning triggers for key indicator northern species as part of a robust Aquatic Effects Monitoring Program. The Framework shall be submitted to the Wek'eezhii Land and Water Board for approval before any discharge of Jay Project effluent into Lac du Sauvage.

3.7 Assessment of Taxonomic Change in Plankton

3.7.1 Original Measure

Measure 12:

DDEC shall incorporate an annual assessment of plankton community changes based on shifts in community structure into any Jay Project Aquatic Effects Monitoring Program with the objective of determining how these changes could ultimately impact fish populations of Lac du Sauvage. Differential impacts to various fish species and age classes must be considered.

3.7.2 Agency's Updated Conclusions

In DDEC's Response to the Agency's Technical Report, there is a commitment to conducting multivariate analyses to assess changes in community structure as well as incorporating these changes in the interpretation of the fish health component of the Aquatic Effects Monitoring Program (Section 2.10.2 [PR#556](#)). At the public hearing, DDEC deferred offering any commitment on assessing plankton taxonomic changes to future regulatory processes (Public Hearing Transcripts-Day 3, pg. 45 [PR#663](#)).

DDEC states that its current Aquatic Effects Monitoring Program (AEMP) has not yet determined toxicological impairment of aquatic life (MVEIRB-UT2-13 [PR#677](#)). However, it is not clear what role, if any, elevated levels of potassium (above CCME Guidelines for the Protection of Aquatic Life) downstream of the Long Lake Containment Facility may have played in the significant decline of populations of two major components of the zooplankton communities in those lakes—cladocerans and rotifers that are important in the diet of fish.

DDEC stated *"If a low action level is triggered for plankton as part of the AEMP Response Framework for the Project, determining how changes in community structure could ultimately impact fish populations could be proposed as part of a response plan..."* (Section 2.10.2 [PR#556](#)). DDEC should establish Action Levels based on statistical determinations of significant plankton species changes including appropriate lead time to prevent significant zooplankton changes that have the potential to negatively affect fish in Lac du Sauvage.

3.7.3 Updated Measure

Measure 12 from the Agency's Technical Report ([PR#556](#)) is amended and renumbered as follows:

Measure 8:

To prevent a significant adverse impact to aquatic life in Lac du Sauvage from the Jay Project, DDEC shall develop an Aquatic Response Framework for the approval of the Wek'eezhii Land and Water Board that incorporates triggers and action levels for Lac du Sauvage plankton community taxonomic changes to prevent adverse impacts to fish populations. To support the Framework, DDEC shall carry out an annual assessment of plankton community changes based on changes in community structure and how these changes could ultimately impact fish populations of Lac du Sauvage. Impacts to various fish species and age classes are to be included. This assessment should be part of the Jay Project Aquatic Effects Monitoring Program.

4.0 WASTE ROCK AND SEEPAGE MANAGEMENT

4.1.1 Original Measure

Measure 13:

To minimize the likelihood of a significant adverse impact to aquatic resources from the Jay Waste Rock Storage Area (WRSA), DDEC shall develop and submit to the Wek'eezhii Land and Water Board (WLWB) for approval, a revised Waste Rock and Ore Storage Management Plan (WROSMP) within one year of initiating overburden stripping operations. The revised Plan shall include:

- Relevant information for the Jay WRSA;
- Information on design, construction, monitoring and management of the facility;
- Full justification and rationale for all proposed setbacks from water bodies;
- A robust monitoring system (including thermal monitoring and/or internal water sampling) with locations identified to provide early indicators or warnings on performance;
- An adaptive management approach with clear triggers and action levels that lead to responses or actions to prevent Acid Rock Drainage; and
- Annual reporting of monitoring results including any trigger exceedances and longer term reporting of trends.

4.1.2 Agency's Updated Conclusions

In its response to the Agency Technical Report for the Jay Project ([PR#556](#)), DDEC suggests there is no need for the Review Board to provide regulatory requirements on this topic as it anticipates similar requirements will be incorporated by the Wek'eezhii Land and Water Board (WLWB) into the Ekati Water Licence

Related to our proposed Measure 13 is the Agency's recommended Measure 7 which states "to prevent a significant adverse impact to water quality, DDEC shall provide specific details to the WLWB as part of any proposed water licence, as to how it plans to encapsulate mercury-laden lakebed sediments within the Jay Waste Rock Storage Area (WRSA) to ensure mercury does not re-enter Lac du Sauvage during operations and closure". In its response to Measure 7 ([PR#556](#)), DDEC suggested there is a strong likelihood the two lakebed sediment samples taken from within the Jay Pit footprint identified in the DAR as possessing mercury concentrations above sediment guidelines

are anomalous and not representative of sediment mercury concentrations in the area. DDEC subsequently undertook a supplemental sediment sampling program within the proposed dike area on September 14, 2015 and results were provided to the Review Board through its response to undertaking DAR-MVEIRB-UT2-11 ([PR#677](#)).

The supplemental sampling program results indicate that, while mercury concentrations may not be as high as originally reported in the Developer's Assessment Report, one of the five sediment samples exceeded the CCME (2001) Interim Sediment Quality Guideline. This reinforces doubt about DDEC's claim that high sediment mercury measurements are only anomalies that don't reflect actual sediment conditions. In addition, arsenic and chromium are well above these CCME guidelines in all five of the recently sampled sites. As these sediments would be destined for the Jay Waste Rock Storage Area, the Agency remains concerned about the potential for sediments or sediment pore water leaking from the WRSA and entering Lac du Sauvage.

4.1.4 Updated Measure

DDEC's supplemental sampling program confirmed mercury concentrations in sediments at one sampled location within the proposed dike area exceed the CCME Interim Guideline and there were similar exceedances for arsenic and chromium. Not wanting to assume any decision of the WLWB, the Agency maintains that there is sufficient justification for a Measure to ensure proper waste rock and seepage management to prevent an adverse environmental impact from the Jay Project. We have modified our proposed Measure 13 and renumbered it accordingly as shown below:

Measure 9:

To minimize the likelihood of a significant adverse impact to aquatic resources from the Jay Waste Rock Storage Area (WRSA), DDEC shall develop and submit to the Wek'eezhii Land and Water Board for approval, a revised Waste Rock and Ore Storage Management Plan within one year of initiating overburden stripping operations. The revised Plan shall include:

- Relevant information for the Jay WRSA including design, construction, monitoring and management of the facility;
- Full justification and rationale for all proposed setbacks from water bodies;
- A robust monitoring system (including thermal monitoring and/or internal water sampling) designed to provide early indicators or warnings on performance;
- An adaptive management approach with clear triggers and action levels that lead to responses or actions to prevent Acid Rock Drainage; and
- Annual reporting of monitoring results including any trigger exceedances and longer term reporting of trends.

5.0 AIR QUALITY AND DUST

5.1 Air Quality and Dust Management

5.1.1 Original Suggestion

Suggestion 1:

GNWT should develop an appropriate and enforceable regulatory framework and system for air quality in the NWT as soon as possible.

5.1.2 Agency's Updated Conclusions

The GNWT response at the public hearing was that it is going to be looking at a regulatory program for all air quality in the NWT (Public Hearing Transcripts-Day 1, pg. 156-157 [PR#639](#)). The GNWT also provided a generic Regulation Development Process (GNWT Response to Undertaking #4 [PR#671](#)); however, a timeline for a specific air quality regulatory framework has not yet been established and the details of the ambient air quality program have yet to be determined.

5.1.3 Updated Suggestion

The Agency would like to maintain our Suggestion that the GNWT develop an enforceable air quality regulatory framework in a timely manner:

Suggestion 1:

GNWT should develop an appropriate and enforceable regulatory framework and system for air quality management in the NWT as soon as possible.

5.2 Air Quality and Dust Monitoring and Monitoring Site Locations

5.2.1 Original Measure and Suggestion

Suggestion 2:

DDEC, in collaboration with GNWT and other interested parties including Diavik Diamond Mines Inc., should develop a regional approach to air quality monitoring, management and mitigation.

Measure 14:

To prevent a significant adverse impact to air quality, DDEC shall develop a revised Air Quality and Emission Monitoring and Management Plan for the Jay Project, collaboratively with interested parties and the GNWT before construction commences. The Plan shall include:

- specific triggers for air quality monitoring results for NO₂, PM_{2.5} and TSP that will result in adaptive management responses and actions including prevention and mitigation;
- detailed actions and responses for tiered thresholds and action levels that will include a range of lead times from immediate action when necessary, but recognize longer term trends;
- a plan and timetable to develop thresholds and actions in relation to dustfall, snow and lichen sampling results;
- plans to manage road traffic to reduce fugitive dust including vehicle spacing, cameras for monitoring amount of dust (visibility), and triggers or thresholds when dust suppressant must be re-applied;
- monitoring and sampling sites to capture dust, and sample snow and lichen on the northern and eastern shores of Lac du Sauvage and along the esker system, and other appropriate sites considering prevailing winds, habitat sensitivity and similar factors; and
- explicit quality assurance and quality control protocols to ensure data reliability and properly functioning equipment.

5.2.2 Agency's Updated Conclusions

With regard to the Agency's Suggestion of a regional approach to air quality monitoring, management and mitigation, we maintain such an approach would be a benefit to both Diavik and DDEC as Diavik and the Ekati Jay Project are in such close proximity to one another and the impacts to air quality (and indirect impacts to other Valued Ecosystem Components, including caribou) are cumulative. A coordinated program would also likely benefit both mines financially and would provide a standardized data set for analysis to assist with further monitoring, management and mitigation.

The Agency recommended a revised Air Quality and Emission Monitoring and Management Plan in our Technical Report as mentioned above. In DDEC's response (s. 2.12.2 [PR#556](#)) and in further documents in the Commitment Table (pg. 41 [PR#681](#)), DDEC committed to further engagement on the Air Quality and Emissions Monitoring and Management Plan following the environmental assessment approval

and prior to the construction of the Project. At the hearing DDEC committed to include adaptive management triggers for NO₂, PM_{2.5}, and total suspended particulates (TSP) related to the GNWT ambient air quality guidelines as proposed by the GNWT in the Plan (Commitment Table pg. 16 [PR#681](#)). DDEC also agreed to further discussion on the topic of triggers around dust (Public Hearing Transcripts-Day 1, pg. 49 [PR#639](#)).

The Agency is largely satisfied with DDEC's response. However, we feel that there are still some outstanding issues as the Agency remains of the view that Jay Project air emissions are likely to cause a significant adverse impact and require a carefully designed monitoring program.

While DDEC is committed to include adaptive management triggers for NO₂, PM_{2.5}, and TSP related to the GNWT ambient air quality guidelines and to report on the air quality data annually (an improvement over every three years), the adaptive management approach for DDEC is only looking at the annual NWT ambient air quality standards and the trends seen over the year. DDEC also needs to be looking at one (1) hour and twenty-four (24) hour standard exceedances from episodic events and should have adaptive management actions in place to address those in addition to the yearly rates. Clear triggers and response actions for other parameters from dustfall, snow sampling, and lichen sampling, also need to be finalized, recognizing that the nature of sampling schedule would show longer term trends.

The Agency's main air quality concern is that dust from all sources, but road dust in particular, may be one of the main drivers in the ZOI for caribou avoidance of the diamond mines and may impact fish habitat in Lac du Sauvage. To mitigate the effects from fugitive dust, there is a need to develop specific and clear triggers and management response actions for road dust mitigation. The key would be to have a trigger that would initiate immediate action when necessary. DDEC should be applying the NWT twenty-four (24) hour air quality standard for TSP specifically for the short-term episodic events that that can occur through operation of the haul roads. If DDEC is found to be having exceedances to these standards at monitoring locations, then DDEC should be increasing dust mitigation actions on its road networks. These mitigation actions, such as applying more dust suppressant and/or decreasing road traffic, must be clearly established.

The Jay Project will be a significant new emission source, and currently there are no sampling or monitoring sites on the north or the east side of Lac du Sauvage, or on the esker system near Jay in the Plan. It is important that there be a commitment to having sampling stations in the design of the Plan to ensure that there is adequate coverage for ambient air quality monitoring, dust fall, snow, and lichen sampling.

5.2.3 Updated Measure and Suggestion

The Agency continues to make the following Suggestion:

Suggestion 2:

DDEC, in collaboration with GNWT and other interested parties including Diavik Diamond Mines Inc., should develop a regional approach to air quality monitoring, management and mitigation.

The Agency would like to maintain our original measure (renumbered) but suggest that the Board include a specific mitigation measure to ensure fugitive dust from the haul roads is reduced.

Measure 10:

To prevent a significant adverse impact to air quality, DDEC shall develop a revised Air Quality and Emission Monitoring and Management Plan for the Jay Project, collaboratively with interested parties and the GNWT before construction commences. The Plan shall include:

- specific triggers for air quality monitoring results for NO₂, PM_{2.5} and TSP that will result in adaptive management responses and actions including prevention and mitigation;
- detailed actions and responses for tiered thresholds and action levels that will include a range of lead times from immediate action when necessary, but recognize longer term trends;
- a plan and timetable to develop thresholds and actions in relation to dustfall, snow and lichen sampling results;
- plans to manage road traffic to reduce fugitive dust including vehicle spacing, cameras for monitoring amount of dust (visibility), and triggers or thresholds when dust suppressant must be re-applied (e.g., adoption of the NWT twenty-four (24) hour air quality standard for TSP monitoring and mitigation along haul roads with exceedances resulting in immediate dust mitigation responses such as applying more dust suppressant or decreasing road traffic);
- monitoring and sampling sites to capture dust, and sample snow and lichen on the northern and eastern shores of Lac du Sauvage and along the esker system, and other appropriate sites considering prevailing winds, habitat sensitivity and similar factors; and
- explicit quality assurance and quality control protocols to ensure data reliability and properly functioning equipment.

5.3 Incineration Management Plan

5.3.1 Original Measures and Suggestions

The Agency did not include a Measure specific to waste incineration or the Incineration Management Plan (IMP) in its July 2015 Technical Report ([PR#498](#)).

5.3.2 Agency's Updated Conclusions

In its response ([PR#555](#)) to the GNWT Technical Report for the Jay Project, DDEC committed to the continuation and on-going improvement of its IMP. This commitment included monitoring and maintaining records of incinerator operating parameters and stack testing the incinerators every three years to assess ongoing compliance with the Canada-Wide Standards for mercury, dioxins and furans. DDEC further committed to submit the incinerator stack test results to GNWT-ENR and Environment Canada within 45 days of receipt of results, unless events beyond DDEC's control prevent it. The commitment was subsequently modified during a September 2015 meeting between GNWT and DDEC (DAR-MVEIRB-UT2-05 [PR#677](#)).

Good incinerator operational control and monitoring of the combustion process is critical to ensuring complete combustion of the feedstock waste. The degree to which the combustion process is completed is a function of the temperature of the combusting gases, residence time in the combustion chamber, how well gases are mixed and the presence of adequate oxygen. DDEC currently monitors temperature in the primary and secondary chambers to monitor the combustion process and does not use in-line continuous emissions monitoring (CEM) technology to sample, analyze and record gaseous emissions exiting the stack and entering the environment.

On Day 1 of the Jay Project Public Hearing, the GNWT accepted an Undertaking to provide the Monitoring Agency with a summary of solid waste incinerator in-line CEM requirements of Canadian federal, provincial and territorial governments. The response to undertaking 3 'GNWT - Compiled Incineration Guidelines and Regulations from Other Jurisdictions' was posted to the Review Board Jay Project public registry ([PR#669](#)) and consisted of more than 700 pages of legislation, regulations, reports, codes and guidelines. Due to its length, the Agency summarized the GNWT's response and the summary is provided in Table 1.

The Agency is supportive of DDEC's commitment to continuation and on-going improvement of its solid waste incineration practices. However, the Agency is concerned that monitoring temperatures in the combustion chambers and conducting stack tests every three years, without in-line CEM, is not sufficient to ensure the satisfactory batch-by-batch incineration of Jay Project solid waste. The Agency believes information provided by the GNWT in its response to Undertaking 3 ([PR#669](#)), and summarized in Table 1, demonstrates the proposed incinerator performance monitoring and compliance regime would not satisfy requirements of those Canadian jurisdictions that currently regulate or control incinerator emission and CEM requirements.

5.3.3 New Measure

The Agency recommends the Review Board include the following Measure related to air quality and solid waste incineration in its final environmental assessment report:

Measure 11:

To prevent an adverse impact to air quality and related environmental impacts, DDEC shall submit to the Wek'eezhii Land and Water Board for approval, a revised Waste Management Plan within one year of initiating overburden stripping operations. The revised Plan shall include an updated Incinerator Management Plan that includes:

- A robust in-line continuous emissions monitoring (CEM) program of incinerator performance and stack gas concentrations;
- Justification and rationale for all proposed CEM technology and methods;
- An adaptive management approach with triggers and action levels that lead to responses and actions to prevent the release of unacceptable levels of pollutants; and
- Annual reporting of monitoring results including any trigger exceedances.

Table 1. Summary of GNWT-ENR Response to Undertaking No. 3

“IEMA wishes to obtain from the GNWT a summary of solid waste incinerator in-line continuous emission monitoring requirements of Canadian federal, provincial and territorial governments.”

Summary Prepared by IEMA

Jurisdiction	Parameter													
	Combustion Temperature	Outlet Gas Temperature	Carbon Monoxide	Carbon Dioxide	Oxygen	Opacity or Particulate Matter	Hydrogen Chloride	Organic Matter	Flow of Flue Gas	Sulphur Dioxide	Nitrogen Oxides	Hydrogen Fluoride	Mercury	Dioxins and Furans
Alberta	✓													
BC	✓	✓ ⁵	✓		✓	✓ ⁵	✓ ⁵							
Ontario³	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quebec	✓		✓	✓	✓	✓ ¹	✓ ²							
NS⁶	✓		✓		✓	✓	✓							
Nunavut	✓		✓ ⁴		✓ ⁴	✓								
CCME	✓		✓		✓	✓	✓							

Notes

- 1 If the incineration facility has a rated capacity of 1 ton or more per hour.
- 2 If the incineration facility has a rated capacity of 2 ton or more per hour and burns halogenated materials.
- 3 Parameters that will be considered on a case-by-case basis for continuous emissions monitoring or long-term monitoring.
- 4 May be required depending on the type and quantity of waste to be incinerated.
- 5 If the incineration facility has a rated capacity of 400 kg/hour or more.
- 6 Regulations reference CCME Operating and Emission Guidelines for Municipal Solid Waste Incinerators (1989)

6.0 CONCLUSIONS

6.1 Process Observations

The Agency made the following Suggestion in our Technical Report ([PR#498](#)):

Suggestion 3:

Canada and GNWT investigate and publicly report on the establishment of a permanent participant funding program for environmental assessments held under Part V of the *Mackenzie Valley Resource Management Act* within one year of the acceptance of the Report of Environmental Assessment.

Given that none of the Aboriginal governments brought forward independent experts at the public hearing, there appears to be a strong and continuing need for participant funding. We note that there were several references to the need for participant funding in the Technical Reports of the Lutsel K'e Dene First Nation (pg. 17-18 [PR#521](#)) and North Slave Metis Alliance (pg. 6 and 29 [PR#522](#)) and the issue was raised by the Tlicho Government during the public hearing (Public Hearing Transcript-Day 3 Yellowknife pg. 181-182 and 227-229 [PR#663](#)). The Agency stands by the Suggestion related to participant funding in our Technical Report.

Suggestion 3:

Canada and GNWT investigate and publicly report on the establishment of a permanent participant funding program for environmental assessments held under Part V of the *Mackenzie Valley Resource Management Act* within one year of the acceptance of the Report of Environmental Assessment.

6.2 Overall Conclusion

The Review Board has several options with regard to its decision on the Jay Project as set out in s. 128 of the MVRMA as follows:

128. (1) *On completing an environmental assessment of a proposal for a development, the Review Board shall,*
- (a) *where the development is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern, determine that an environmental impact review of the proposal need not be conducted;*

- (b) where the development is likely in its opinion to have a significant adverse impact on the environment,
 - (i) order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c), or*
 - (ii) recommend that the approval of the proposal be made subject to the imposition of such measures as it considers necessary to prevent the significant adverse impact;**
- (c) where the development is likely in its opinion to be a cause of significant public concern, order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c); and*
- (d) where the development is likely in its opinion to cause an adverse impact on the environment so significant that it cannot be justified, recommend that the proposal be rejected without an environmental impact review.*

Based on our review of the evidence filed to date on the Jay Project public registry as summarized above, and our knowledge and experience with the Ekati Mine, the Agency recommends to the Review Board that it find there is likely to be a significant adverse impact on the environment as set out in s. 128(1)(b) of the MVRMA.

We have reached this conclusion in reviewing evidence for the key lines of inquiry, namely caribou and water, but also for some of the subjects of note for this environmental assessment including air quality, and waste rock and seepage management. As presented in our Technical Report ([PR#498](#)), the Agency continues to believe there are significant uncertainties around some of the Developer's predictions, a lack of clarity around some significance determinations, and limited details on mitigation, monitoring and management of impacts to the environment from the Jay Project. For these reasons, the Agency remains of the view that there is likely to be a significant adverse impact to the environment from the Jay Project

We are mindful of the many commitments that DDEC has made during this environmental assessment and commend the Developer for these. However, some of the current site-wide Ekati Mine mitigation measures, monitoring programs and management plans, in our view, require improvements. To ensure that the commitments on some of the key lines of inquiry and subjects of note become binding on DDEC and possible future operators, and to provide for a coordinated follow-up program, we believe that a number of Measures should be imposed by the Review Board to assist in mitigating or preventing a significant adverse impact to the environment from the Jay Project. These Measures have appeared following each of the subject matters we reviewed above.

The Agency believes that the likely significant adverse impact to the environment from the Jay Project can be largely prevented with the adoption of the Measures we have recommended and with careful and collaborative follow-up actions, including a rigorous

regulatory review. We encourage the adoption of our Measures as a comprehensive package to better manage the Valued Ecosystem Components identified as key lines of inquiry and subject of notes throughout this assessment. We look forward to working with the Developer and all the other interested parties to implement the Measures and Suggestions from the Review Board and the commitments made by the Developer.

6.2.1 Follow-up

The Agency recommended the following Measure in our Technical Report ([PR#498](#)):

Measure 15:

DDEC and other parties to whom Measures and Suggestions have been directed, shall report annually on progress made on the Measures, Suggestions and commitments recorded in the Report of Environmental Assessment for the Jay Project. DDEC's annual reporting on Measures, Suggestions and commitments is to be included in the Annual Report now submitted pursuant to the Environmental Agreement and water licence.

The Agency has considered DDEC's response (pg. 16-17 [PR#556](#)) to the above recommended Measure. To be clear, the Agency is not advocating for changes to the Environmental Agreement to accomplish a thorough and rigorous follow-up program from the Jay Project environmental assessment as the company claims. Nor is the Agency convinced that the three-year Environmental Impact Report is an appropriate mechanism to ensure proper tracking and reporting on the outcomes of the Jay Project environmental assessment. Given the inability of GNWT to assess the effectiveness of its efforts to implement important caribou-related Measures from previous environmental assessments ([PR#678](#)) it is not at all clear how tracking and reporting on the Jay Project Measures, Suggestions and commitments will be accomplished. The Agency continues to believe that the above Measure is sound and in the public interest, and urges the Review Board to adopt it.

Measure 15 from the Agency's Technical Report ([PR#556](#)) is retained and renumbered.

Measure 12:

DDEC and other parties to whom Measures and Suggestions have been directed, shall report annually on progress made on the Measures, Suggestions and commitments recorded in the Report of Environmental Assessment for the Jay Project. DDEC's annual reporting on Measures, Suggestions and commitments is to be included in the Annual Report now submitted pursuant to the Environmental Agreement and water licence.

6.3 Summary of Recommended Measures and Suggestions

For the convenience of the Review Board and other parties, the Agency's recommended Measures and Suggestions are compiled below, including any revisions or new Measures:

Measures

1. To prevent a significant adverse impact to caribou, DDEC shall implement further measures to minimize the ecological disturbance footprint for the Jay Project as follows:
 - selection of the Jay haul road route that minimizes disturbance to high quality caribou habitat ([PR#305](#) DAR-IEMA-IR-28 and [PR#356](#) Anne Gunn's proposed routing);
 - additional mitigation to reduce the effect of haul truck and other traffic on caribou (e.g., a dust management best practices document with adaptive management triggers for additional dust suppression; more precautionary traffic management to reduce sensory disturbance such as greater use of convoys and scheduling breaks in traffic); develop rules for blasting to reduce sensory disturbance;
 - investigate and implement an esker crossing that involves selection of less critical habitat, one-way traffic, buried power lines, remote sensory devices, and other innovative approaches; and
 - fund a panel of experts (beyond those involved in the current assessment and review) to help better design and monitor the results of the Jay Project infrastructure, including the crossing of the Misery esker system.

2. To prevent a significant adverse impact to caribou, DDEC, with other mine operators and GNWT where possible, shall develop and implement a collaborative research program designed to identify the causes of the Zone of Influence (ZOI) for caribou avoidance. The research findings will then be implemented to reduce the size of the ZOI on caribou. The results of the research program are to be summarized and reported annually to all interested parties as part of DDEC's annual report under its Wildlife Effects Monitoring Program. A target date for development of the research program is one year following the acceptance of the Measures by Responsible Ministers and implementation of the research results to reduce the ZOI within five years. DDEC shall commit to using the results of the research for the existing Ekati Mine.

3. To obtain information needed to prevent a significant adverse impact to caribou, DDEC shall undertake aerial surveys to monitor relative caribou distribution and abundance and measure the effectiveness of mitigation measures for caribou currently in use for Ekati and proposed for the Jay Project. The aerial survey study

area should be enlarged to include the extensions related to the proposed Jay Project and reasonably foreseeable Sable footprints. Given new analytical techniques, survey timing will be established in collaboration with interested parties but designed to track trends over time. DDEC shall produce estimates of ZOI distance and magnitude for the Jay Project (including the entire Ekati Mine) for the combined Ekati-Diavik study area using the new R code analysis. The results of the aerial surveys and analysis of the ZOI are to be reported annually (as appropriate) as part of DDEC's Wildlife Effects Monitoring Program reports, and will serve as means of measuring the effectiveness of Jay Project caribou mitigation and offsetting measures..

4. To prevent a significant adverse impact to caribou and to reduce public concern with the Jay Project, DDEC shall prepare an Offset Mitigation Plan for caribou. The purpose of the Plan is to enhance the ability of the Bathurst caribou herd to recover to its previous abundance as measured through reductions in energy loss, and positive changes in calf production and survival. The Plan should contain a suite of concrete offset measures, such as delays or phasing in other activities in the claims block including the Sable Project, or scheduling winter-only operations at the Sable and/or Jay Projects. The Plan should include means to evaluate the effectiveness of the measures. To the extent possible, the Plan should be developed collaboratively with interested parties, and shall be a condition of a land use permit for the Jay Project and in compliance with s. 95 of the *Wildlife Act*. The Plan should be prepared and circulated by DDEC to the Wek'eezhii Renewable Resources Board, GNWT, Independent Environmental Monitoring Agency (IEMA) and affected Aboriginal governments within one year of the acceptance of the Report of Environmental Assessment and shall be in place before construction commences on the Jay Project. Offset measures should be reported on annually and evaluated by ENR, the Agency, community governments, and an independent expert panel, membership of which could be named by ENR, DDEC and the IEMA, and funded by DDEC. Based on this evaluation, the Plan should be adaptively managed annually to ensure its adequacy in offsetting impacts of Jay.
5. To prevent a significant adverse impact to caribou and to reduce public concern with the Jay Project, ENR use its authority under the *Wildlife Act* to require Wildlife and Wildlife Habitat Protection Plans (s. 95 of the *Wildlife Act*) from existing developments to reduce impacts on the Bathurst herd.
6. To prevent a significant adverse impact to water quality, DDEC shall develop and submit to the Wek'eezhii Land and Water Board for approval, a revised Water Management Plan for the Jay Project within two years of initiating de-watering operations of the Jay Pit. The Plan shall include:

- Identification of specific surface and minewater management contingencies including capacities (in terms of effluent volumes and mine production as expressed in operating days);
 - Design, construction and implementation timing for each identified surface and minewater management contingency option with sufficient lead times for design, construction and implementation;
 - Detailed monitoring of water quality and quantity to enable early detection of success or failure; and
 - Associated adaptive management trigger thresholds for implementation of contingencies.
7. To prevent a significant adverse impact to aquatic life in Lac du Sauvage from Jay Project effluent, DDEC shall develop a rigorous Aquatic Response Framework that includes early warning triggers for key indicator northern species as part of a robust Aquatic Effects Monitoring Program. The Framework shall be submitted to the Wek'eezhii Land and Water Board for approval before any discharge of Jay Project effluent into Lac du Sauvage.
8. To prevent a significant adverse impact to aquatic life in Lac du Sauvage from the Jay Project, DDEC shall develop an Aquatic Response Framework for the approval of the Wek'eezhii Land and Water Board that incorporates triggers and action levels for Lac du Sauvage plankton community taxonomic changes to prevent adverse impacts to fish populations. To support the Framework, DDEC shall carry out an annual assessment of plankton community changes based on changes in community structure and how these changes could ultimately impact fish populations of Lac du Sauvage. Impacts to various fish species and age classes are to be included. This assessment should be part of the Jay Project Aquatic Effects Monitoring Program.
9. To minimize the likelihood of a significant adverse impact to aquatic resources from the Jay Waste Rock Storage Area (WRSA), DDEC shall develop and submit to the Wek'eezhii Land and Water Board for approval, a revised Waste Rock and Ore Storage Management Plan within one year of initiating overburden stripping operations. The revised Plan shall include:
- Relevant information for the Jay WRSA including design, construction, monitoring and management of the facility;
 - Full justification and rationale for all proposed setbacks from water bodies;
 - A robust monitoring system (including thermal monitoring and/or internal water sampling) designed to provide early indicators or warnings on performance;
 - An adaptive management approach with clear triggers and action levels that lead to responses or actions to prevent Acid Rock Drainage; and

- Annual reporting of monitoring results including any trigger exceedances and longer term reporting of trends.
10. To prevent a significant adverse impact to air quality, DDEC shall develop a revised Air Quality and Emission Monitoring and Management Plan for the Jay Project, collaboratively with interested parties and the GNWT before construction commences. The Plan shall include:
- specific triggers for air quality monitoring results for NO₂, PM_{2.5} and TSP that will result in adaptive management responses and actions including prevention and mitigation;
 - detailed actions and responses for tiered thresholds and action levels that will include a range of lead times from immediate action when necessary, but recognize longer term trends;
 - a plan and timetable to develop thresholds and actions in relation to dustfall, snow and lichen sampling results;
 - plans to manage road traffic to reduce fugitive dust including vehicle spacing, cameras for monitoring amount of dust (visibility), and triggers or thresholds when dust suppressant must be re-applied (e.g., adoption of the NWT twenty-four (24) hour air quality standard for TSP monitoring and mitigation along haul roads with exceedances resulting in immediate dust mitigation responses such as applying more dust suppressant or decreasing road traffic);
 - monitoring and sampling sites to capture dust, and sample snow and lichen on the northern and eastern shores of Lac du Sauvage and along the esker system, and other appropriate sites considering prevailing winds, habitat sensitivity and similar factors; and
 - explicit quality assurance and quality control protocols to ensure data reliability and properly functioning equipment.
11. To prevent an adverse impact to air quality and related environmental impacts, DDEC shall submit to the Wek'eezhii Land and Water Board for approval, a revised Waste Management Plan within one year of initiating overburden stripping operations. The revised Plan shall include an updated Incinerator Management Plan that includes:
- A robust in-line continuous emissions monitoring (CEM) program of incinerator performance and stack gas concentrations;
 - Justification and rationale for all proposed CEM technology and methods;
 - An adaptive management approach with triggers and action levels that lead to responses and actions to prevent the release of unacceptable levels of pollutants; and
 - Annual reporting of monitoring results including any trigger exceedances.

12. DDEC and other parties to whom Measures and Suggestions have been directed, shall report annually on progress made on the Measures, Suggestions and commitments recorded in the Report of Environmental Assessment for the Jay Project. DDEC's annual reporting on Measures, Suggestions and commitments is to be included in the Annual Report now submitted pursuant to the Environmental Agreement and water licence.

Suggestions

1. GNWT should develop an appropriate and enforceable regulatory framework and system for air quality management in the NWT as soon as possible.
2. DDEC, in collaboration with GNWT and other interested parties including Diavik Diamond Mines Inc., should develop a regional approach to air quality monitoring, management and mitigation.
3. Canada and GNWT investigate and publicly report on the establishment of a permanent participant funding program for environmental assessments held under Part V of the *Mackenzie Valley Resource Management Act* within one year of the acceptance of the Report of Environmental Assessment.