Independent Environmental Monitoring Agency

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October 18, 2017

Violet Camsell-Blondin
Chair, Wek'eezhii Land and Water Board
#1-4905 48th St, Yellowknife, NT
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**Re: Dominion Diamond Ekati Corporation (DDEC) Sable Aquatic Effect Monitoring Program (AEMP)
Design Plan and the Aquatic Response Framework Version 2.0**

Dear Mrs. Camsell-Blondin,

The Independent Environmental Monitoring Agency (Agency) has reviewed the Sable AEMP Design
Plan (Design Plan) as well as the Aquatic Response Framework 2.0 (ARF) and provides the following
comments for your consideration.

Sable AEMP Design Plan

Slimy Sculpin Sampling

In its April 21, 2017 directive B (i) the Wek'eezhii Land and Water Board (WLWB) required DDEC to
report "*the suitability of incorporating Slimy Sculpin in the Sable AEMP*". Despite the successful 2016
slimy sculpin sampling, the Sable AEMP Design Plan proposes to remove the 3-year small-bodied
(slimy sculpin) analysis in favour of large-bodied (harvestable species) analysis conducted every 6
years. Limited information was provided to justify the decision to remove the small-bodied fish
analysis.

In the Design Plan, DDEC seems to be proposing an either or approach to fish monitoring for the
Sable AEMP. The Agency, on the other hand, believes that incorporating both slimy sculpin and
harvestable fish, as is currently done in the AEMP for Koala and King–Cujo watersheds, is more
effective in monitoring effects of the fish communities in impacted lakes. Slimy sculpin sampling
every 3 years would help fill the 6 year gap between fish monitoring. In addition, looking at bottom-
feeding slimy sculpin, which is a prey of larger piscivorous fish, can help link food chain effects
between contamination of the benthos and contaminants possible flowing up the aquatic food chain
into harvestable fish species.

In its AEMP design plan for other watersheds DDEC seems to agree with the Agency's position. DDEC
stated that the current AEMP for Koala and King–Cujo "*balances these two priorities [minimizing
sampling impacts on fish populations and ensuring fish are safe to eat] and supplemental monitoring
of slimy sculpin between large-bodied fish sampling events assists in ensuring that any change in fish*

tissue chemistry would be detected in a timely manner." (Oct 6 2016 response to IEMA review comment #12 on 2015 AEMP Re-evaluation). The 2016 sampling results for small-bodied fish in the Sable study area showed that DDEC was able to successfully complete the study, with greater than 30 individuals caught at each of the sites, indicating that small-bodied fish monitoring is a viable option. It is not clear why DDEC would not take a consistent approach to its fish monitoring design for all impacted watersheds on its mining property.

Recommendation: Fish monitoring frequency and species monitored should be consistent for all watersheds impacted by the Ekati mine. As such, 3-year slimy sculpin monitoring should be included in the Sable AEMP, but not to the exclusion of monitoring of harvestable (large-bodied) fish.

Large-Bodied Fish Sampling

The Design Plan states that "*Large-bodied fish will be monitored if mine-related changes in water quality, sediment quality, or lower trophic levels (i.e., plankton or benthos) are observed and indicate that their sampling is warranted; the need for large-bodied fish sampling will be determined through the three-year AEMP Re-evaluation process.*" (p. 3-4). The proposed Design Plan is only considering sampling large-bodied fish if necessary. Sufficient explanation is not provided on what would be required for large-bodied fish sampling to be initiated. Considering that monitoring fish health is one of the key goals of the AEMP, it is inappropriate to not have any regular fish monitoring with which to determine fish health.

Recommendation: DDEC should explain what criteria would be used to determine if and when large-bodied fish monitoring would be initiated. As mentioned in the previous recommendation the Agency believes that fish monitoring frequency and species monitored should be consistent for all watersheds impacted by the Ekati mine.

Aquatic Response Framework Version 2.0

Fluoride Benchmark

The environmental monitoring data collected annually in the AEMP informs the ARF. Action levels for water quality rely on a quantitative benchmark for each measured water quality variable as reported in the AEMP. These benchmarks are set from government guidelines (i.e., Canadian Council of Ministers of the Environment (CCME), BC Ministry of Environment), derived from the literature, or tied to the Site-Specific Water Quality Objectives (SSWQO) for Ekati. Nineteen of the 28 benchmarks for water quality in the ARF use government guidelines.

The CCME guideline (protection of aquatic life) for fluoride is 0.12 mg/L. In the ARF, DDEC uses a benchmark of 0.27 mg/L (Table 3.1-2), based on a literature review that found this concentration as a fish Toxicity Reference Value (TRV). While the Agency is pleased to see that DDEC has included a fluoride benchmark, there is no discussion or rationale in the ARF regarding the development of this benchmark. It is interesting to note that according to Figure 6.1-8 of the 2016 AEMP Report, the CCME guideline for fluoride of 0.12 mg/L was exceeded in Cujo Lake in 2016. Greater rationale supporting the selection of the proposed fluoride benchmark is needed. Instead of providing rationale in the ARF, DDEC cited a 2015 ERM report Waste Rock Storage Area Screening Level

Ecological Risk Assessment. In the Agency's opinion, any rational regarding an AEMP benchmark should be contained within the ARF and not just reference another report. DDEC should have brought forward this discussion into the ARF, with rationale for why the TRV is preferable to the lower CCME guideline as an ARF benchmark.

Recommendation: A detailed explanation of the development of a benchmark for fluoride should be provided in this report. Included should be a rationale for using a fish TRV rather than the lower CCME guideline concentration.

Sampling depth

As part of its 2015 AEMP Re-evaluation and 2017-2019 Design Plan Reasons for Decision, February 27, 2017, the WLWB deferred a discussion regarding sampling depth for stratified lakes to the ARF 2.0. Currently three sampling depths (surface, medium and deep) are monitored in stratified lakes. The sampling results are then averaged and compared to the response plan low action levels. In its decision the WLWB stated that "*With respect to the Response Framework, it might be useful to consider comparing concentrations from the lower depth stratum to the low action level, rather than the average concentration.*" (p. 8). Given the results reported in the 2015 AEMP Re-evaluation (Section 5.3-1 and 5.3-2) that showed the deep-water strata in Koala watershed lakes contained the highest concentrations of most chemicals of concern, the Agency supports the suggestion to compare the deep water samples for the stratified lakes to the response framework low action levels. This would be consistent with the intent of the response plan to act as an early warning system of potential impending environmental harm. It also better reflects the actual concentrations that organisms living at depth are exposed to.

Recommendation: DDEC compare the concentrations from the lower depth stratum to the low action levels in the response plan to determine if the low action level was exceeded.

Should you have any questions concerning these comments, the Agency is pleased to discuss these at your convenience.

Sincerely,

Jaida Ohokannoak
Chairperson

Cc: Dominion Diamond Ekati Corporation – Claudine Lee, April Hayward
        Tlicho Government – Jessica Hum
        Yellowknives Dene First Nation – Alex Power
        Lutsel K'e Dene First Nation – Ron Griffith
        North Slave Metis Alliance – Nicole Goodman
        Kitikmeot Inuit Association – Geoff Clark
        Government of the Northwest Territories – Kate Witherly, Laurie McGregor
        Indigenous and Northern Affairs Canada – Michael Roesch