



## **INDEPENDENT ENVIRONMENTAL MONITORING AGENCY**

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October 18, 2016

Violet Camsell-Blondin  
Chair, Wek'eezhii Land and Water Board  
#1-4905 48th St, Yellowknife, NT  
X1A 3S3

Dear Ms. Camsell-Blondin,

### **Re: Sable AEMP Design Plan Version 1.1**

The Independent Environmental Monitoring Agency (Agency) has reviewed Dominion Diamond Ekati Corporation's (DDEC) Sable AEMP Design Plan v 1.1 (Sable AEMP) and submits the following comments for your consideration.

### **General**

#### **Sable AEMP Workshop**

The updates provided in Sable AEMP are the result of the Wek'eezhii Land and Water Board's (WLWB) Reason for Decision on Sable AEMP design plan version 1.0 dated April 1, 2016. In its decision the WLWB provided DDEC with a list of directives (a-t) to be submitted in this updated version of the Sable AEMP or added to the Ekati AEMP Re-evaluation.

In addition to the list of directives the WLWB also required DDEC to host a workshop to discuss directives which were based on reviewer comments. The minutes of the meeting were taken and are included in the Sable AEMP. The minutes are well done and accurately capture the dialogue and tone of the meeting. The intent of the workshop was to allow for a back and forth discussion of key concerns with the intent of reaching some sort of agreement. The Agency had Tim Byers (phone), Jesse Jasper and Marc Casas attend the workshop with an open mind and prepared to have an honest discussion of the issues. The Agency was disappointed to see that DDEC did not have the same approach and appeared reluctant to consider reviewers' comments. This point was most evident during an exchange between Barry Zajdlik (GNWT consultant biometrician) regarding the inclusion of a power analysis. DDEC essentially refused to allow Barry to speak, eventually other attendees insisted on allowing Barry to provide his input. It was noted that some of the back and forth insisting Barry be allowed to speak was not included in the minutes however, DDEC's reluctance to allow Barry's input was clear. See the attached Addendum for the relevant portion of the meeting notes from the Sable AEMP Design Plan workshop.

**Recommendation:** DDEC be more open to discussion during future workshops and or meetings.

## **WLWB's Reason for Decision and associated Directives – April 1, 2016**

### **Directive C - TK input into the AEMP**

Section 3.2.3.1 – explains that Traditional Knowledge (TK) input will not be used for slimy sculpin DELT assessments, therefore there will not be any TK input in the Sable AEMP. Directive C of the April 1, 2016 letter stated that “[if TK was not to be used in slimy sculpin DELT] *DDEC is to identify other ways in which TK input will be incorporated into the Sable AEMP beyond possible future assessment of large-bodied fish, and include this discussion in the revised Sable AEMP Design Plan.*”. There was no discussion of how or why no TK will be used in the Sable AEMP. Surely DDEC considered ways in which TK involvement could be incorporated in the Sable AEMP before reaching their conclusion that it would not be incorporated.

**Recommendation:** DDEC explain what process or rationale was used to determine that TK would not be incorporated in the Sable AEMP. If DDEC has determined that fish TK cannot be incorporated, then it should explain whether it has solicited TK for other aquatics monitoring such as water quality, sediment quality and the like.

### **Sediment Sampling**

It is still not clear to the Agency why 2016 baseline sampling for sediment quality would not have replaced or supplemented the Ekman dredge with the K-B corer for sampling. Results of a comparative analysis of dredge vs corer sediment samples as reported in the 2015 AEMP Re-evaluation (p. 5-56) showed that “concentrations of nine variables (TOC, total nitrogen, antimony, arsenic, molybdenum, nickel, phosphorus, selenium, and strontium) are generally higher in the 1st cm core than in the 2 cm Ekman samples”. Further, substituting corer sample results for Ekman results would have identified mine effects on sediment quality for nitrogen (King-Cujo watershed) and selenium (King-Cujo and Koala) that were not identified previously.

Ekman samples are known to be affected by poor control of subsampling depths and the loss of newly-deposited surface sediments that are not yet consolidated with the substrate. Given slow deposition rates in tundra lakes, Ekman dredges may dig up a higher proportion of the deeper pre-development material, resulting in possible diluting of mine-affected sediment quality with the “cleaner” sediment below. Using the corer this early in Sable mine development would also avoid problems in incorporating data from two sampling devices at different AEMP time periods.

**Recommendation:** DDEC should use the K-B corer, either alone or in tandem with the Ekman dredge, in sampling sediment quality for the Sable AEMP.

## **Appendix A: Baseline Data Summary for the Sable Aquatic Effects Monitoring Program**

### **Section 3.0 (pg-15):**

In the WLWB's April 1, 2016 Directive DDEC was required to address concerns with regards to the amount of baseline data for the Sable AEMP, which included hosting a workshop and a summary report detailing the amount of available baseline data. Appendix A of version 1.1 is an ERM Memo providing a detailed summary of available baseline data and how DDEC proposes to fill any identified gaps. Section 3 p-15 outlines their approach regarding baseline data which states:

*In general, less than two years of available baseline data were considered a data gap because a minimum of two years of baseline data are recommended to account for natural inter-annual variability. Additionally, some baseline data should ideally be collected as close in time as reasonably possible to the initiation of development to reduce the possibility that differences between baseline and post-development data are due to long-term temporal changes unrelated to mine activities. Therefore, an additional year of baseline monitoring will be carried out in 2016. Although some construction will occur in 2017, discharge is not anticipated to commence until the summer of 2018, thus allowing the opportunity to collect additional information at some locations in 2017 and the winter of 2018 to fill data gaps that will remain after the 2016 baseline program.*

The Agency is pleased that DDEC acknowledge and are trying to fill data gaps, however we believe DDEC should take full advantage of the remaining years prior to discharge to the receiving environment (Horseshoe Lake) to provide as complete a data set as possible. DDEC has a minimum requirement of 2 years and acknowledges that older data sets are less preferable to current data. DDEC should not adopt minimum requirements as acceptable standards. They should be taking advantage of all the time available to provide as robust a baseline data set as possible. Best practice would indicate that a more appropriate approach would be to use the available time to not only meet but exceed the minimum requirement of 2 years of data. Additional baseline data will allow the AEMP to better distinguish or identify any potential mine effects once discharge begins.

Further to the above, the WLWB Reasons for Decision directive 't' asked for a workshop discussion on possible contaminant pathways outside the Horseshoe watershed, which addressed the Agency concern about Osprey watershed possibly receiving seepage from the Sable waste rock pile. DDEC said that seeps monitoring will alert DDEC of impending water quality problems coming off the WRSA. Then DDEC could develop an AEMP program within Osprey watershed to monitor any potential effects, however, this course of action would not allow for BACI (before-after, control-impact) analysis to determine to what degree any seepage would have changed water quality from pre-development conditions in Osprey watershed, since there would be no baseline sampling. DDEC has vaguely stated that there are "some pre-existing data ...available" for Osprey but have not presented what kind of data these are (p. 5 of workshop minutes).

**Recommendation:** DDEC conduct full AEMP sampling in water bodies to be affected by the Sable development for both 2016 and 2017 sampling seasons. This will ensure the most complete baseline data set given the time constraints, and allow for increased statistical power with which to identify changes.

### **Section 3.3 – Fish**

Section 3.3 states:

*There has been no baseline small-bodies fish community or biological sampling performed in any of the proposed Sable AEMP lakes, thus a baseline data gap exists for all the parameters that will be monitored for slimy sculpin populations as part of the Sable AEMP program. Tables 2.3-1a and 2.3-1b include details of the monitoring program planned for 2016 to address these data gaps. Following the 2016 small-bodied fish baseline program, the need for an additional year of baseline fish data will be assessed. Similar to the other baseline data gaps it is anticipated that an additional slimy sculpin sampling could be completed in 2018 if deemed necessary (prior to or during the first year of discharge into the Horseshoe Watershed).*

Given the admitted lack of baseline data for slimy sculpin and the fact it is the only fish sampling currently proposed, the Agency believes that 1 year of fish sampling is not sufficient. DDEC should not wait for the 2016 results before determining if a second year of sampling should occur in 2018.

**Recommendation:** DDEC commit to a second year of slimy sculpin sampling in 2018. Again this will improve DDEC's ability to detect changes from baseline, because 1 year of baseline data will make it very difficult to determine change.

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

Sincerely,



Jaida Ohokannoak  
Chairperson

Cc: DDEC – April Hayward  
Tlicho Government - Sjoerd van der Wielen  
Yellowknife Dene First Nation – Alex Power  
Lutsel K'e Dene First Nation – Lauren King  
North Slave Metis Alliance – Shin Shiga  
Kitikmeot Inuit Association – Jared Ottenhof  
Government of the Northwest Territories – Laurie McGregor  
Indigenous and Northern Affairs Canada – Jennifer O'Neil

## **Addendum 1:**

### **Sable AEMP v 1.1 Appendix B (p-25-26): Excerpt for Sable AEMP Workshop (May 19, 2016) – Meeting Notes**

**Barry Zajdlik** - DDEC conduct a power analysis prior to June meeting, to show ability to detect change.

**Harry O’Keefe (DDEC)**- At the June meeting we will discuss the Ekati AEMP, and re-evaluation and we’re discussing its design. The importance of that June meeting is to evaluate the Ekati AEMP, apply lessons learned, and practices of how other watersheds have been affected.

**Barry Zajdlik** - Part of getting AEMP right is getting sufficient data. 1 year isn’t enough data to detect change.

**Trish Auser (ECC)** - Supports what Barry says.

**April Hayward (DDEC)** - It is important to recognise that statistics aren’t all we use to determine change and our effect on the environment. I appreciate your comment on our power to detect change, but it is not the only method we have.

**Barry Zajdlik** - It may not be the only method, but it is the objective to supply sufficient data. I don’t know why it wouldn’t be done?

**April Hayward** - Thanks for your comment.

----- Power analysis discussion continued on page 26 (below)---

**Bill Pain (GNWT)** - Due to the short timeline for collecting baseline data. I would encourage DDEC to initiate a power analysis. Do you have enough statistical analysis? It is not the be all and end all but it is important. And with it we would feel more comfortable with moving forward.

**Harry O’Keefe** - We can only generate as much statistics as we have with a June 7 deadline. Can’t rush statistics, but can take it into consideration. Exactly why it’s not the only tool we use, because errors can occur. Needs to be done in a thorough and thoughtful manner. The Board will become aware of this comment.

**Marc Casas (IEMA)** - I’m not a statistics guy, but I understand the importance. What is involved in a power analysis, and why do you say it takes so long? When Barry says it doesn’t take a long time.

**Harry O’Keefe** - It takes longer than 2 weeks. It is a process where you add and remove sampling numbers, to see if you can detect change. With an increase in the number of samples what does that do to your ability to see change. Testing the ability to detect change.

**Margaret (Dillon consulting)** - this discussion has been covered. So we should move on.

**Marc Casas** - Why not take Barry’s description of how it is done?

**Harry O’Keefe** - It will not be done in time for June 7.

**April Hayward** - We appreciate the interest in our ability to detect change, and we will take it into consideration. Barry is correct it can be done, Harry is correct that it is complex. And it varies depending on the kind of analysis that you run. Which would change through time in the program and change our analysis. And we will take it back with us for consideration, we have noted the concern.

**Tim Byers (IEMA)** - Barry was going to summarize the different flavours of power analysis. I think that would be helpful, and what's involved in them.

**April Hayward** - we will review them and take them away with us to think about.

**Barry Zajdlik** - I could give a brief talk about it.

- The power analysis that is relevant is a priori analysis which estimates in the variance of the baseline data, from reference lakes. Would be a matter of estimating variance from them, some measurements. Then determine what if the variance is the same as the watershed looking at to estimate the sample size. The context of aquatic and early warning trigger, to detect change. If you can't do that then there is a problem with the program. Filing the data, extracting it and running it through a power analysis.