

# ***NORTH SLAVE MÉTIS ALLIANCE***

***PO Box 2301 Yellowknife, NT X1A 2P7***



April 20<sup>th</sup>, 2007

Sarah Baines  
Wek'èezhìi Land and Water Board  
[sbaines@wlwb.ca](mailto:sbaines@wlwb.ca)

## **Re: MV2001L2-0008 Proposed Chloride Discharge Criterion**

The North Slave Métis Alliance (NSMA) has reviewed the January 2007 report by Rescan, proposing a chloride discharge limit for the Sable Kimberlite Pipe Development.

Overall, we feel the proposed criterion is too high to ensure the protection of this environment, and we do not support the use of a mixing zone. Details of our concerns and outstanding questions follow:

**Hardness for Toxicity Testing:** We are very concerned with the hardness used for toxicity testing. Rescan states “preliminary results from tests conducted using water of varying hardness demonstrates that *Ceriodaphnia* may exhibit a lesser degree of sensitivity to chloride in waters with a greater hardness”. The current toxicity tests were conducted at moderate hardness, i.e. 80 to 100 mg/L of CaCO<sub>3</sub>, however the natural hardness of Horseshoe Lake is said to be only 7 to 9 mg/L. The toxicity of the chloride might actually be higher than that tested in this study. This is also particularly concerning because *Ceriodaphnia* is the second most sensitive species tested, and it is unclear exactly how resident species in Horseshoe Lake will respond.

**Species Used for Toxicity Testing:** It is unclear how many, if any, species used are residents in the Horseshoe Lake watershed. It is mentioned in Section 6.3 that the two most sensitive species tested (*Ceriodaphnia dubia* and *Daphnia magna*) were in fact not residents of EKATI lakes, and that “although the HC<sub>5</sub> value calculated would be expected to be protective of these species, resident species may exhibit a higher or lower degree of sensitivity to chloride”. We ask that BHP/Rescan specify which species tested are residents of EKATI lakes, and if no resident species was tested, we ask that at least two resident species be tested at average temperatures for the Horseshoe Lake.

**Temperature of Toxicity Tests:** Most of the tests conducted were done at above 20°C, except for one toxicity test on fish. We believe that some of the tests should be done at temperatures that are nearer the natural temperatures of Horseshoe Lake. Temperature could either increase or decrease the toxicity of chloride and we feel it is important for the toxicity tests to be comparable to natural conditions so that we can be confident that the results of these tests are representative of the actual toxicity in Horseshoe Lake.

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***Ph: (867) 873-NSMA (6762)***

***Fax: (867) 669-7442***

***Email: general@nsma.net***

**Interactions With Other Ions:** We appreciate that BHP/Rescan included toxicity testing on interactions of chloride with another ion (i.e. sodium) on toxicity. However, we are concerned that it is mentioned that potassium chloride has a higher potential for synergistic effects, but there is no statement on the background concentrations or expected concentrations in the effluent for potassium. We would like BHP to provide baseline values for all possible dissolved ions, including sodium and potassium, in the background, in groundwater on or near site and in the effluent.<sup>1</sup>

**Effluent Discharge:** At no point has the effluent been characterized. In order to properly understand the interactions chloride might have in the receiving environment, it should be recognized that several factors such as dissolved oxygen concentration, temperature, exposure time and the presence of other contaminants influence chloride toxicity. Please provide some information to this regard.

**Proposed Effluent Discharge Criterion for Chloride:** Please describe and compare the EDC values described in section 5.4 and how they are justifiable or comparable with the CCME standards, where drinking water should not exceed 250mg/L and the freshwater chronic and acute levels are of 150mg/L and 600mg/L respectively. It should also be noted that CCME has a non-degradation policy and should not be used for benchmarks.

**Reliability of Modelling:** It is important that the model used be as robust as possible. As such, we expect some sort of ground truthing, particularly at peak freshet, which is said to be the time of lowest dilution. There is no evidence in this report that this was conducted. This would be helpful for not only chloride testing, but testing of toxicity of any other compound present in the effluent.

**Cumulative Effects:** This proposed chloride discharge criterion does not consider the cumulative effects from other developments adding chloride to this watershed. We would like BHP to address the potential cumulative effects on this watershed. Chloride could not only have a toxic effect on the aquatic ecosystem, but could also change behaviours of the species living in the watershed. At an AEMP workshop for Diavik, a traditional knowledge holder from the KIA mentioned the sudden lack of Arctic Char, a freshwater fish, upstream on the Coppermine River. Since this system also drains into the Coppermine River, it is important to understand the cumulative effects of adding more chloride to this entire system.

**Lack of Consultation and Traditional Knowledge:** This criterion does not involve any form of consultation with the aboriginal parties. Even if this criterion is below a measured toxicity for species in the watershed, there are other changes that could occur from an increase in chloride into a pristine lake. This could include composition changes to fish communities, changes in fish behaviour and a change to taste of the water. As such, aboriginal parties must be consulted about the level of change they are willing to accept.

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<sup>1</sup> NOTE: Potassium chloride tends to be the most toxic salt to fish and aquatic invertebrates, while magnesium chloride is next in toxicity, followed by calcium chloride and then sodium chloride.

**Mixing Zone :** The proposed limit of 313 mg/l should be met at the outlet of Two Rock Lake, which is BHP's last point of control, and also SNP station #0008SA-3. There are uncertainties regarding mixing patterns and dilution volumes, and difficulties sampling during freeze up and break-up which lead to unacceptable uncertainty regarding the protection of the environment throughout the year and over time. If the chloride discharge criteria were to be set at a level above the chronic toxicity threshold for the most sensitive species present, a fisheries authorization would be required to discharge into the receiving environment.

We found Rescan's report relatively easy to read and appreciate the efforts by Rescan to produce a report of a manageable length for reviewers and at a level that is understandable to individuals who are not specialist in the field. We particularly appreciated Section 6, Uncertainty Evaluation, since it adds a transparency to the document and gives the reviewer more confidence in the results by understanding the limitations of the study.

NSMA would have appreciated the opportunity to consider the review comments from the Independent Environmental Monitoring Agency and the Responsible Authorities prior to the comment deadline. Not only would we like to see their final comments, but also the considerations that contributed to their decisions, so that we may have the benefit of their comments to consider when consulting with our members and determining our communal positions or views, and so that we can decide whether or not to use their expert advice or endorse their comments.

Is it possible for the Board to establish comment deadlines for community reviewers that are at least two weeks later than the comments are due from responsible authorities and independent experts in the future?

Sincerely,

Sent by email April 20, 2007

Sheryl Grieve  
Lands and Resources Manager  
[lands@nsma.net](mailto:lands@nsma.net)

c.c. IEMA c/o [monitor1@yk.com](mailto:monitor1@yk.com)  
c.c. INAC c/o [FairmanF@inac.gc.ca](mailto:FairmanF@inac.gc.ca)  
c.c. Env. Cda. c/o [Anne.Wilson@EC.GC.CA](mailto:Anne.Wilson@EC.GC.CA)  
c.c. DFO c/o [HannaB@DFO-MPO.GC.CA](mailto:HannaB@DFO-MPO.GC.CA)

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