Environment Canada Environnement Canada

Environmental Protection Operations
P.O. Box 2310
5019 – 52nd St 4th Floor
Yellowknife NT X1A 2P7

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Your file: 2BB-BOS0712

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven NU X0B 1J0

licensing@nunavutwaterboard.org

RE: NWB 2BB-BOS0712 – Hope Bay Mining Ltd. – Water and Ore/Waste Rock Management Plan for the Boston Site, Hope Bay Project

Environment Canada (EC) staff have reviewed the Water and Ore/Waste Rock Management Plan for the Boston Site, Hope Bay Project, dated July 2009, supplied by Hope Bay Mining Ltd. and provide the following comments for your consideration.

Bulk sampling was done at the Boston Site in 1996-97 and resulted in stockpiling of 26,760 tonnes of ore in the camp area. Previous practices at this site included the use of up to half of the ore materials for construction and top dressing of roads, the airstrip, camp base, and the tank farm berms and pad. These practices have been discontinued, but the report documents the release of arsenic, and to a lesser extent, nickel, nitrates, chloride, sulphates, iron, and selenium from the rock piles. All of the waste rock and most (two thirds) of the ore volumes are reported to be non-acid generating. Flowing seepage is present, and is monitored on the tundra to the east of the ore piles.

Given that the majority of runoff and seepage flows into Aimaokatalok Lake (Section 2.8), either directly or indirectly, there are water quality concerns. The potential effects of the ore and waste rock on the downstream environment were examined using a dilution model (Supporting Document B); however, EC does not consider dilution to be an acceptable method to reduce contaminant concentrations (e.g. see *Metal Mining Effluent Regulations* Section 6). Discharge quality should be non-deleterious at "end of pipe", and should be demonstrably non-acutely toxic at that point. The *Fisheries Act* applies to waters which flow into waters frequented by fish, and as such the ephemeral streams, which have been deemed not to be fish habitat based on a lack of channel characteristics and limited flows, should none-the-less be protected from the discharge of deleterious substances.

While subsequent sampling of the ephemeral streams indicated that in fact there is significant attenuation of metals along the flow path through the tundra, which eliminates

the need for dilution as stipulated in the model, several parameters, such as sulphate and chloride, were not reduced. Targets should be set for all the potential contaminants of concern in the discharge, and periodic analysis of the receiving environment done. EC is pleased to see that monitoring of the ephemeral streams will continue, however further details are needed on how the degree of natural attenuation of the tundra will be established. When will the capacity to remove these parameters be reached?

In Section 2.8 the sensitivity analyses suggested that efforts to reduce seepage from the ore stockpiles would help protect water quality in East Bay. Are there any plans to complete this work? If so, would this work be similar to planned closure activities? Similarly, plans describing mitigation measures that would take place in the event that attenuation in the tundra decreases or if the receiving environment approaches or exceeds set targets should also be established.

Section 3.2.1 states that a small portion of the runoff is allowed to accumulate in containment ponds or other low areas on site; this runoff is then discharged onto the tundra. This section also indicates that "water accumulating in these areas is **typically** [emphasis added] monitored prior to discharge". Why is not all the discharge monitored? As well, no information is included on what is done if the monitoring criteria are not met in these containment ponds or low areas. Is storage capacity an issue?

In terms of the closure plans, Section 4, a thorough description of how/when the decision will be made to either move the ore into condensed stockpiles and cover or move for processing should be included.

As described in Section 5.1, a survey of rinse pH and conductivity will be done every ten years. This monitoring frequency may be too low, given that lab results predicted higher metal leaching than is being observed, and that the rock materials are releasing poor quality leachate.

Comments on Supporting Document A: Geochemical Characterization of Historic Waste Rock and Ore Stockpiles at the Boston Deposit, dated April 2009:

In Sections 3.2.1 and 4.1 it is indicated that some the most northeast piles of ore appear to have been placed on tundra. Mitigation plans should include the removal of these from the tundra onto a storage pad.

In Section 4.2 it states that "although some parameters in the seepage currently exceed CCME guidelines for aquatic life, there is a considerable distance between the stockpiles and receiving water, and it is likely that a risk assessment will show that these levels are within acceptable limits for a source material." Is a risk assessment planned or if not, why not?

In summary, the plan outlines the management plans, anticipated monitoring activities and possible closure options for this site. EC acknowledges that this site may be included in a regional development proposal in the near future; however more detail on management and remedial activities would be beneficial. If the proponent is not prepared

to implement closure measures to isolate the ore in the near future, then actions should be taken to capture, treat and properly dispose of seepage/leachate.

Environmental Protection Operations (EPO) requests that we be notified of changes in the proposed or permitted activities associated with this submission. Please do not hesitate to contact me at (867) 669-4772 or by e-mail at jane.fitzgerald@ec.gc.ca with any questions or comments.

Yours truly,

Jane Fitzgerald
Environmental Assessment Coordinator

cc: Carey Ogilvie (Head, Assessment & Monitoring, EPO)
Carrie Spavor (Environmental Assessment Coordinator, EPO)
Anne Wilson (Water Pollution Specialist, EPO)