

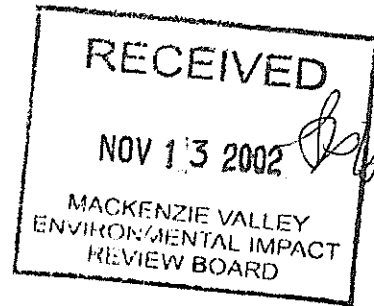


Environment Canada  
Environnement Canada

Environmental Protection Branch  
Suite 301, 5204 50<sup>th</sup> Avenue  
Yellowknife, NT  
X1A 1E2

November 13, 2002

Mr. L. Azzolini  
Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
Suite 200, 5102 – 50<sup>th</sup> Avenue  
Yellowknife NT Canada X1A 2N7



**RE: Environment Canada's List of Issues for Snap Lake Technical Sessions**

Dear Mr. Azzolini,

I have attached a list of issues that Environment Canada feels warrant discussion at the Snap Lake Technical sessions scheduled for November 25, 2002.

Please contact me if you have any questions or concerns about this submission.

Sincerely,

Mark Dahl  
Contaminants Biologist  
Environmental Protection Branch  
(867) 669-4734 Fax (867)873-8185  
mark.dahl@ec.gc.ca

cc: Robin Johnstone, De Beers Canada Mining Inc., Yellowknife, N.W.T.



## ENVIRONMENT CANADA ISSUES - SNAP LAKE TECHNICAL SESSIONS, NOV - DEC 2002

### WATER QUALITY

#### Issue:

##### Water Treatment Plant Operation and Capacity

Environment Canada concurs with the GLL report titled "Rationale of Technical Issues - De Beers Snap Lake Diamond Project" (GLL report) which notes that it is unclear if the De Beers treatment plant has sufficient treatment capacity to deal with higher than expected water flows, or to provide operational redundancy against malfunctions.

#### *Why is this an issue?*

The capacity and reliability of the treatment plant underpin the whole water management plan for the project. Given that there is very little water storage available for high flow periods and that the mine will require continuous de-watering during operation it is critical that the plant function effectively and reliably. While it is stated that the capacity of the treatment plant will be increased as project demand increases this does not address contingencies in the event of plant failures or periods of unexpectedly high water flow.

#### *How will resolution of this issue add value to the EA?*

Verification that the treatment plant has sufficient capacity to effectively treat water at times of high flow will ensure that the impact predictions made in the EA report are correct.

#### Issue:

EC concurs with the GLL report that the Storage Capacity of the Mine Water Containment Pond (MWCP) is an issue which requires further discussion. De Beers must demonstrate that the pond has sufficient capacity to protect Snap Lake from releases of water that could potentially degrade lake water quality.

#### *Why is this an issue?*

The storage capacity of the MWCP is small relative to the inflows it receives. De Beers has indicated that there is sufficient storage available in the pond to buffer the treatment plant during high flow periods. However, the pond does not have the capacity to hold the inflows if there is a long term malfunction or maintenance issue or if natural runoff is extremely high. For instance, in July of this year the Snap Lake site received 300 % of expected precipitation. If this event occurred during the operation of the mine it is unlikely that the pond would have had sufficient storage capacity.

#### *How will resolution of this issue add value to the EA?*

The capacity of the mine water containment pond is critical to the site water management plan. An accurate assessment of the capacity will provide assurance that Snap Lake will be impacted as predicted in the EA.



***Issue:***

EC is in agreement with the GLL report that the treatment process as presented in the EA may be insufficient to treat water to an acceptable level for release. As stated in the report the treatment plant is predominantly a filtration plant which may not provide effective treatment for parameters such as ammonia, metals and phosphorus. De Beers has combined the proposed plant with a mixing zone in Snap Lake to attain acceptable concentrations of parameters of concern.

De Beers has assumed that a mixing zone is an acceptable method of reducing parameters of concern in the effluent stream to acceptable levels. Environment Canada recommends that water treatment should be employed to reduce the concentrations of reducing parameters of concern before the effluent is released to the receiving environment. It should be noted that the receiving environment begins at the end of the pipe. Specifically EC would like assurances that the treatment plant used will employ best available technology to treat parameters of concern before considering the use of a mixing zone to dilute the effluent.

***Why is this an issue:***

It is the responsibility of De Beers to minimize the impacts associated with their development, and clearly, treatment of wastewater is necessary to mitigate impacts to Snap Lake. Early in the environmental assessment process EC indicated to De Beers that the use of a mixing zone to dilute the discharge effluent should only be considered after incorporating best available treatment technology for parameters of concern. EC further emphasized that the size of the mixing zone should be kept to a minimum in order to minimize impacts to Snap Lake. However, in the EA report De Beers does not appear to have considered these suggestions. In fact, De Beers suggests using a basic water treatment plant which employs filtration to treat the water for TSS. De Beers further suggests that a mixing zone 230 metres in diameter which comprises 1% of the lake would be required for most of the parameters of concern to be below chronic effect levels for zooplankton. The capacity of the suggested water treatment facility to effectively treat many of the other parameters of concern is uncertain and requires further discussion. Refined or additional treatment processes may be able to reduce or eliminate the need for a mixing zone.

***How will resolution of this issue add value to the EA?***

A commitment from De Beers to utilize best available treatment will minimize potential impacts of the project and reduce uncertainty in impact assessment.

***Issue:***

EC concurs with the GLL report which indicates that the output of the phosphorus model is counter-intuitive and requires clarification.

***Why is this an issue?***



De Beers indicates that the project will increase phosphorus loading to Snap Lake but predict an overall decrease in total phosphorus in the lake. The model relies on rapid cycling of phosphorus in the biota, and sequestering to the sediments. If the model is inaccurate and phosphorus levels in the lake rise, the impacts of increased phosphorus loading on the lake may be detrimental. These impacts include increased productivity (and associated ecosystem changes) and increased demand on dissolved oxygen concentrations under the ice.

***How will resolution of this issue add value to the EA?***

Clarify the basis for phosphorus model outputs and impacts related to phosphorus in order to ensure that predicted impacts on Snap Lake are realistic.

**Air Quality**

***Issue:***

EC concurs with the GNWT that an technical session should be held on Air issues, specifically to clarify the emission information and sources used for modeling the impacts of air emissions on the environment.

***Why is this an issue?***

Air emissions are an issue that warrant discussion at the technical sessions because several parameters were not discussed in the EA, including SO<sub>3</sub>, CO, VOC and acid mist; some clarification of model inputs is also required.

***How will resolution of this issue add value to the EA?***

Reduce uncertainty in assessing the impacts of air emissions on the environment.



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