



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

Jason Ash
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O.Box 2130
Yellowknife, NT X1A 2P6

File: Water Licence MV2001L2-0002

March 5, 2009

Subject: De Beers Snap Lake Mine – Ore Storage, Waste Rock, and Processed Kimberlite Management Plan (November 2008), and North Pile East Cell Design (Embankment Structures – November 2008, Perimeter Water Control Structures – October 2008)

Dear Mr. Ash,

The following documents have been reviewed by SLEMA:

- **Ore Storage, Waste Rock, and Processed Kimberlite Management Plan (OSWRPKMP, November 2008), and**
- **North Pile East Cell Design**
 - **Embankment Structures – November 2008, and**
 - **Perimeter Water Control Structures – October 2008.**

Comments are presented as follows.

Ore Storage, Waste Rock, and Processed Kimberlite Management Plan

The submission seems to be a draft document. It is recommended that De Beers proof-read the document, correct typos, and update the description with details about ore stockpile, land farm, and land fill, etc.

- Sub-section 2.3, p11: The description of processed kimberlite stockpiling is too brief and something seems to be missing. More details are requested.
- Sub-section 2.5, p12: There are typos in the last sentence of the first paragraph.
- Section 4, p1: The last sentence might be redundant.
- Sub-section 5.1.1, p21: There are typos in the last sentence.



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

- Sub-section 8.2, p 33: It is stated that the landfill will be relocated to the East Cell, and then to the West Cell with the North Pile development. Is the landfill part of the waste management area (WMA)? If yes, the WMA was already relocated to the south of the Starter Cell, and clarification and/or correction are requested; if no, more detail about the landfill is requested.
- The East Cell is so close to the lakeshore that any spill from sumps which collect runoff and seepage would impact the lake water quality. Spill Report # 09-005 demonstrates that sump spill does occur. Daily inspections at all water control structures within the North Pile area and water transfers in a timely manner were already proposed by De Beers after the spill to prevent similar occurrences. Further engineering measures might be required.
- Our Science Panel member Ann Gunn raised concerns on wildlife safety during the site visit (May 30-June 2, 2008). She pointed out the potential and previously unpredicted hazard to caribou from the processed kimberlite slimes, and the potential hazard to caribou from large angular material of the road slopes. Her comments are posted in the following link: [http://www.slema.ca/documents/SLEMA/Review/2008/Mine%20site%20visit%20May%202008%20Science%20Panel%20\(PDF\).pdf](http://www.slema.ca/documents/SLEMA/Review/2008/Mine%20site%20visit%20May%202008%20Science%20Panel%20(PDF).pdf). Will De Beers take appropriate measures to reduce the above hazards to caribou while constructing and operating the East Cell? If yes, what are they?

SLEMA agrees with Environment Canada (EC) and the Department of Environment and Natural Resources (ENR), the Government of Northwest Territories on their comments about OSWRPMP, and recommends De Beers take efforts to improve the document quality prior to next submission for approval.

North Pile East Cell Design

The review focused on the Water Management Component of the East Cell design. Overall, the design is justifiable, and the only concern is the buffer zone.

Buffer Zone

There is a requirement for the minimum distance between the North Pile and Snap Lake, called buffer zone. De Beers made a commitment of the 50 meter buffer zone.

In Sub-section 4-3 of the Perimeter Water Control Structures Detailed Design Report, it states "*(T)he design concept for promoting the flow of water from Snap*



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

Lake into the perimeter water control structures along the shoreline has been discussed above; namely, that the invert elevation for the structures within 50 m of the shoreline will be at least 0.1 m below the lake level.” It clearly indicates that the 50 meter buffer zone between the North Pile and Snap Lake might not be complied, although seepage will be controlled by the mitigative measures described in the East Cell Perimeter Water Control Structure Design.

Footprint vs. Height of the North Pile

Current arrangement plan is too close to the lake, which resulted from limited development space in the mine site and the relatively large footprint required by the PK deposition capacity. There were originally three footprint options, and one option with moderate pile visibility was chosen. The option provides flexibility for storage of PK material within a relatively moderate size footprint (92 ha) and without exceeding the maximum landform elevation (484 m).

There is a dilemma, i.e. the protection of Snap Lake vs. the pile visibility. If the pile visibility could be compromised, i.e. the North Pile height increases by a few meters, the footprint of the North Pile would be smaller. Then the buffer zone could be kept, or even extended to 100 meter setback between the North Pile and Snap Lake.

Further investigation of the alternative option to Ease Cell development is recommended. In the process, the incorporation of the traditional knowledge (TK) is also recommended.

Water Level Monitoring

In the spring, both Snap Lake and the sumps will have higher water level due to spring freshets. Furthermore, spills due to overflow of runoff and process water collected from the water control structures did occur. For example, 20 m³ of process water spilled out of the temporary sump (TS #3) of the Starter Cell on January 6, 2009 (Spill Report #09-005).

Therefore, it is recommended to closely monitor the water levels in sumps, ditches and Snap Lake, especially during spring freshets period, and to keep water level in sumps and drainage ditch below the water level in Snap Lake. In addition to daily inspections and timely water transfer from the sumps to the water management pond (WMP), engineering measure and operation procedures could reduce or eliminate the chance of spills to Snap Lake, for example,

- Real time monitoring in Perimeter Sump #4, and
- Pumping schedule based on water levels.



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

SLEMA would be pleased to discuss the above comments with De Beers and others to ensure improved environmental management plans and designs.

Sincerely,

(Original signed by)

Johnny Weyallon
Chairperson

cc: Indian and Northern Affairs Canada
Environment and Natural Resources, GNWT
Environmental Canada
De Beers Canada Inc.