



# **Snap Lake Environmental Monitoring Agency**



2011-2012  
ANNUAL REPORT

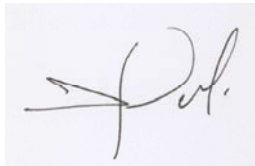
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## Message from the Chairperson

It is my pleasure to present the 2011-2012, Snap Lake Environmental Monitoring Agency (SLEMA) Annual Report. We have put together information that we hope will provide you with a summary of our many activities. In the course of the year SLEMA has produced numerous documents, expressing our opinion on plans and reports submitted by De Beers. SLEMA has also produced documents expressing our concerns on a variety of subjects such as the proposal by the three diamond mines to undertake grizzly bear DNA research, to inspection regularity and scheduling by the Department of Aboriginal Affairs and Northern Development. SLEMA has continued to provide all the stakeholders with a monthly report of changes and events at the mine, as well as a summary of SLEMA's activities. SLEMA also continued to encourage De Beers to integrate Traditional Knowledge into the Environmental Monitoring at Snap Lake. SLEMA visited the community of Lutsel K'e to update the community on mine development and environmental concerns. Most notably SLEMA was involved in the Water License renewal process by actively participating in the technical sessions and public hearings. SLEMA also submitted a host of recommendations for the new water license, most of which were embraced and included in the new water license.

SLEMA will continue to work with the communities, regulators and De Beers to ensure that the Snap Lake Mine will not leave a lasting legacy on the environment, that would interfere with the stakeholders' healthy use of the land and its resources.

A handwritten signature in black ink, appearing to read 'J. Weyallon', is centered on a light blue rectangular background.

Johnny Weyallon

Chairman

Chairperson Weyatì

Dì nìht'è 2011-2012, Snap Lake Environmental Monitoring Agency (SLEMA) Annual Report họt'e. Xo ghàà t'asì hazo kàza k'è eghàlats'ìda sùì wegodi naxìgha hòlì. Xo ghàà SLEMA nìht'è l'òò k'è eghàlagìda xè edaàni t'asì xè edexè sìgogèhzi ghò edàgìwò sùì wenìht'è De Beers ts'ò ageèhzi. Eyits'ò SLEMA nìht'è gìt'è, edaàni sòmbak'è t'asì sahcho weghàà ìchì k'è eghàlageèda, eyits'ò edaàni eyits'ò edàht'è Department of Aboriginal Affairs eyits'ò Northern Development wet'a sòmbak'è k'aeta sùì gìgha nezì le. SLEMA sah tat'è edaàni sòmbak'è t'asì ìadì weghàlageèda eyits'ò edàgòt'ì sùì d'one gha wegodi hohìe họt'e. Eyits'ò SLEMA, De Beers sùì D'one Naàwò t'à Snap Lake Ndè Hoìdì t'à eghàlageèda ha gìwò. SLEMA, Lutsel K'e k'òta nàgede, edaàni sòmbak'è hohìe eyits'ò edaàni ndè hoìdì ghò d'one xè gogìdo. SLEMA wexè agot'ì t'à Water License Tì T'à Eghàlats'eèda Nìht'è k'achì weghòchì ha elets'eèhdì goxè àit'ì. SLEMA, tì t'à eghàlats'eèda nìht'è wegòò wet'a edaàni eghàlageèd ha gìwò sùì hagedì, eyì wehda sùì tì t'à eghàlats'eèda nìht'è wegòò xè agìla.

SLEMA, k'òta d'one gha eghàlageèda ha, naàwo ghàà eghàlaede d'ò eyits'ò De Beers xè eghàlageèda t'à Snap Lake Sòmbak'è ndè hoìdì ha gìwò, haàni dè zò ndè hotì wet'àhot'ì xè wet'à edets'eèda ha dì le họt'e.



## Chipewyan Translation

K'aldher Dene ba yati niãã

Ku sini sî jâ 2011-2012 Snap Lake nare æasi hadi hêl ghalada dené déltth'i (SLEMA) æasí haãni si xâ. Áã xaiyé t'at'u gháládá si ghâ. Jâ hani áã áã nila si ghâ t'at'u gháládá si ghâ. Áã xaiyé t'at'u De Beers t'at'u æasié hel gháláná ts'î æeritá'ís nila si beghá yati nilyá tth'i æeritá'ís nedhé beghá halí. Nuni t'a ghâ nanidé si beghá hadi hel tth'i jâ nuhé nare kaghé tsambá k'é halá si diri sás cho benonetá hoãã tth'i xaiyé kanélt'u hat'u ghaladá tth'i Dené sôáiné k'aldé chu Northern development æáãni. SLEMA si dené bá æasié haãni si t'â behel si t'at'u tsamba k'e nare gháládá haãni tth'i æasié æedô nalyá dé chu æáãni tth'i SLEMA t'a k'e gháládá si. SLEMA si De Beers si Dené ch'anié hel æasié hadi hoãã Snap Lake nare. SLEMA si Áutselk'é nathedél æeyer dené hel naíãki t'at'u tsambá k'é nare æasié hadi hêl ghádá si chu tth'i t'a ghâ nanidé si chu æaãni. SLEMA si diri ku hel gháládá si ts'î æeritá'ís degoth nalyé si behel nilé beghá nati nahédíl-u tth'i harélyô dené hel naki si behel nilé. SLEMA si yati áã nila ku ts'ôk'ath diri t'at'u ku hedi si xâ beyaki naãtsí ku ts'î æeritá'ís gothé naãé bel æalyé xá sni.

SLEMA si denehel hayoríla dené nadé si hel gháláná-u t'â æasié haãni hel-u tth'i De Beers diri Snap Lake k'e ghálaná si ni ts'íthi horélæí æat'ehilé. Dené bené ts'ídhí horélæílé ni nezô hoselæí æat'é t'abek'é hôlî si chu.

Johnny Weyallon

Begharé naki k'aldher

## **What is SLEMA**

The Snap Lake Environmental Monitoring Agency's (SLEMA) Board was established under direction of the De Beers Snap Lake Diamond Project Environmental Agreement, established between De Beers, Government of Canada, Government of the Northwest Territories and the four affected Aboriginal Organizations. The Aboriginal representatives originate from the Tlicho Government, Yellowknives Dene First Nation, North Slave Metis Alliance and the Lutsel K'e Dene First Nation. The mandate of SLEMA is to support the aboriginal parties in protecting the environment, support liaison between the parties, support De Beers and Government in protecting the environment, review environmental performance, serve as a public watchdog for the regulatory process, and provide a public repository for reports and plans in relation to the Snap Lake Project

## **What are SLEMA's Responsibilities**

SLEMA's mandate is established under Article IV Section 4.2 of the Environmental Agreement and are as follows.

- (a) support the Aboriginal Parties' efforts to protect the environmental interests on which they rely;
- (b) support collaborative and information-based liaison amongst all the Parties;
- (c) support De Beers, Canada, and GNWT in their respective efforts to protect the environment;
- (d) review and monitor the environmental performance of the Project using western science and traditional knowledge;
- (e) work with De Beers to mitigate environmental impacts of the Project thereby mitigating the potential for socio-economic effects;
- (f) serve as a public watchdog of the regulatory process and the implementation of this Agreement;

- (g) make recommendations to any body having regulatory or management responsibility for a matter, for the achievement of the purposes and guiding principles in this Agreement;
- (h) facilitate programs to provide information to and consult with the members of the Aboriginal Parties;
- (i) report to the Parties and the public on the Monitoring Agency's activities and the achievement of its mandate; and
- (j) provide an accessible and public repository of environmental data, studies and reports relevant to the Monitoring Agency's mandate.

### **How is SLEMA Structured**

SLEMA is directed by a board of eight individuals with two representatives each from the four signatory aboriginal groups. The board takes direction from two panels, a science panel and a traditional knowledge panel. SLEMA also has two full time employees, an Executive Director that administers the agency and an Environmental Analyst, who reviews documents from De Beers and also provides direction to the board.

**Executive Board Members:**



**Johnny Weyallon**

Chairperson

Tlicho Government



**Rachel Crapeau**

Vice Chairperson

Yellowknives Dene  
First Nation



**Charlie Catholique**

Secretary

Lutsel K'e Dene First  
Nation



**Sheryl Grieve**

Treasurer

North Slave Metis  
Alliance



**Board Members:**



**Greg Empson**

Yellowknives Dene  
First Nation



**Hugh McSwain**

North Slave Metis  
Alliance



**Noel Drybones**

Tlicho Government



**James Marlowe**

Lutsel K'e Dene First  
Nation

**Traditional Knowledge Panel:**

**Eddie Camille** and **Harry Apples**, *Tlicho Government*

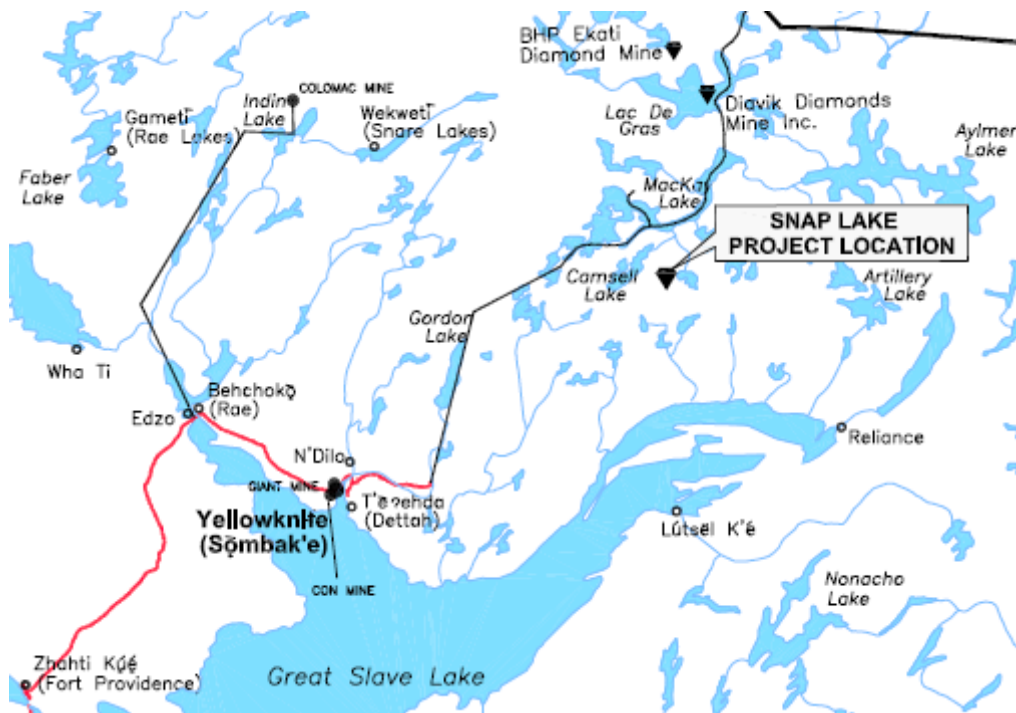
**Eddie Jones** and **Wayne Langenham**, North Slave Metis Alliance

**Albert Boucher** and **Madeline Drybones**, Lutsel K'e Dene First Nation

**Mike Francis**, Yellowknives Dene First Nation

## Snap Lake Diamond Mine

The Snap Lake Mine (Mine) is a diamond mine owned and operated by De Beers Canada Inc. (De Beers), and is located about 220 kilometers northeast of Yellowknife, Northwest Territories (NWT). De Beers received regulatory approval for the Mine in 2004, which included Environmental Agreement, Water Licence, Land Use Permit, Land Lease, and Fisheries Authorization. Mining began in 2007 and is expected to continue for 22 years.



Map 1. Location of Snap Lake Diamond Mine

The Mine maintained production level between 55% and 85% of full capacity through 2011. 814,000 tonnes of kimberlite were processed, and 881,000 carats of diamond were produced.

De Beers has committed to maintaining the highest environmental management standards. The Snap Lake Mine is the only diamond mine in the NWT that has certified its environmental management systems to the high international standard, ISO 14001, through advanced exploration, construction and operation.



**Photo 1. Core Facilities of the Mine Site**



**Photo 2. The North Pile (Starter Cell and East Cell)**

There were 8 Water Licence inspections and 5 Land Use Permit inspections conducted by the Inspector of the Aboriginal Affairs and Northern Development Canada (AANDC) in 2011, all issues brought up by the Inspector were addressed or are being addressed.

Within 2011, approximately 705,762 tonnes (or 411,798 loose cubic meters) of coarse reject of processed kimberlite (PK) and 580,848 m<sup>3</sup> of slimes were deposited into the North Pile Starter Cell. 8,457,100 m<sup>3</sup> of mine water, collected runoff and seepage water were treated in the Water Treatment Plants and discharged into Snap Lake. In addition, 322,779 m<sup>3</sup> of water were recycled in the Mine.

In March 2012 De Beers started the trial deposition of PK paste into the East Cell.

Water Licence MV2001L2-0002 expired in June 2012 after an extension of 60 days. On May 25, 2012 De Beers was granted the new Water Licence MV2011L2-0004, with a period of 8, years commencing June 14, 2012 and expiring June 13, 2020.

### Agency Activities 2011-2012

- SLEMA normal board activities include 3 core group meetings of the board, 5 Executive board meetings and 2 workshops involving the board elders from the traditional knowledge panel as well as various technical experts that are involved in providing SLEMA with their advice.
- SLEMA had a mine site tour in September 2012 and is involved in observing the fish tasting at Snap Lake, also in September 2012.
- SLEMA also made numerous comments or recommendations though out the year towards the mine or government, which will be described in more detail as we go forward.
- Monthly Environmental Update has been published on SLEMA's website ([www.slema.ca](http://www.slema.ca)) and distributed to all stakeholders.
- SLEMA visited Lutsel Ke on February 2 and 3, 2012, made presentations for the school, elders and the community council.

### Environmental Agreement

#### 2010 Environmental Agreement Annual Report

The report submission was delayed due to translation issues, although all of the components required by the Environmental Agreement were complete and had been sent to SLEMA.

SLEMA officially received the 2010 Environmental Agreement Annual Report in October 2012. In SLEMA's opinion this document was still in draft form.



## 2010 Wildlife Effects Monitoring Program Report

The Wildlife Effects Monitoring Program is one of the fundamental programs at Snap Lake that has its roots in the base line studies that date back to 1999 and proceeded until 2004 until the development of the mine, the studies were then established into an annual study programs. 2010 was the 11th year of this program. SLEMA reviews this document on an annual basis and for 2012 provided these comments for the 2010 report. In 2010, no caribou were observed during the single post calving aerial surveys of the local study area which was in mid-November. Caribou sightings from the 2010 wildlife log were 36 observations compared to ~250 in 2009 and 13 in 2008. In the 2010 Wildlife Incidences, caribou were seen near the airport and emulsion plant but no details are reported except that they did not have to be deterred.

The number of 2010 wolverine sightings (7) decreased sharply compared to 2009(27) and 2008 (57). The number of fox sightings increased in 2009 (99) and 2010 (103) from 2008 (62) although the number of fox incidences was 7, 10, and 6 in 2008-10. The 2010 report has no details on the fox incidences and their circumstances. Wolf sightings were 2 in 2010 compared to 15 in 2009 and 3 in 2008.

In 2010, monitoring for grizzly bears in the Regional Study area changed from looking for sign to hair-snagging at scent stations. Only 1 of 40 stations (checked 3 times) had bear hair and no bears were recorded in the 2010 wildlife log or list of wildlife incidences. The trend since 1999 has been a reduction in grizzly bear sign.

### **SLEMA Comments:**

Overall comments:

- 1) The amount of explanatory detail is noticeably less than previous reports. Additionally, most of the same problems previously noted remain in the 2010 report even although De Beers had responded positively to the previously raised comments. This suggests that a new approach is needed for SLEMA relative to WEMP report. With this in mind, I looked at the Ekati and Diavik WEMP most recent annual reports. The amount of detail and the clarity of data presentation is a contrast to the Snap Lake WEMP.
- 2) The level of detail prevents understanding of how the results contribute to the monitoring objectives. It is not clearly stated how the WEMP meets its stated objective of how the Snap Lake monitoring contributes to regional monitoring and then for cumulative effects (p.3; 2010 report).
- 3) The 2010 report is inconsistent in when information is reported for a 2010 only or previous years. For example wildlife log sightings are for 2010 while Interactions are reported for the previous years (which are useful).
- 4) A continued omission from the annual report is that there is no mention of environmental variability at the mine site itself. Some indexes to the extent of environmental variation are an essential component of cumulative effects (to assist discriminating between project related and environmental effects). Factors such as timing snow-melt, freeze-up and an indication of exceptionally hot or wet weather need



to be reported as they can influence the wildlife behavior and abundance. At least for Ekati, environmental information is annually included in the WEMP reports.

**5)** The level of systematic monitoring for wildlife in the local study area was low in 2010 (One caribou aerial survey, the bear surveys and no wolverine survey). It is difficult in the absence of adequate survey effort to distinguish between reduced abundance and reduced surveys. However I do agree it makes no sense to survey in the absence of animals but there does need to be more attention paid to the triggers for surveys, to be assured that the absence or low abundance is not a consequence of survey effort. More analysis is needed to correlate a local reduction in abundance of carnivores with the decline in the size of the Bathurst herd as no evidence is presented for this. Although it might seem intuitive, it is unclear what the time lags might be between the change in grizzly bear, wolves and wolverine to the decline in caribou.

**6)** The wildlife sightings log and the Incident reports are useful information even though the unknown level of effort for the sightings is a problem in interpreting any trends. The information could be better presented (date and location of sighting) and comments such as repeat sighting) and cross-linked with Incident reports. More consideration could be given to on-site standardized monitoring such as surveying for wildlife along a fixed route and vantage points in the Local Study Area (similar to part of Diavik's approach).

**7)** Section 7 (conclusions and review of impact predictions) is generalized statements which would be more suitable in the multi-year comparison. In a single year monitoring report, there is not the data or analyses (or citations for analyses) to support the statements in Table 7.1. The conclusions on one hand comment on the effectiveness of monitoring while on the other one hand the report also notes the annual variation in the wildlife sightings.

#### Specific comments:

**1)** The same comment made for previous annual reports is the use of endpoints for detecting mine-related effects. De Beers refers to the use of measurable endpoints or indicator variables (such as abundance, distribution, probability of occurrence). There is no explanation of how the endpoints will be used to separate project-related effects from natural environmentally caused ones. The endpoint for abundance is the range of values measured 1999-2004 (preconstruction) and the data annually vary which raises the question of whether it is reasonable to expect to separate project-related effects from natural environmentally caused ones using this design.

**2)** The three listed objectives for caribou are vague. The objectives need to be broken down into measurable components with testable research hypotheses. The aerial survey design will need to be re-considered in light of the Zone of Influence and reduced caribou abundance.

**3)** Section 2.1 lists wildlife mitigation practices but the report does not assess or summarize their frequency of use and effectiveness.

4) Table 3.1. The dates of migration are dependent on the dates of the first and last aerial surveys – the table should include the dates for the ‘triggers’ for when the surveys were undertaken (satellite-collared caribou, camp sightings). In 2007, De Beers committed to SLEMA to include details on those triggers. An explanation is needed for why the 15 Nov date which is the latest date for a survey was chosen. Analyses are needed to determine if there is a relationship between the reductions in caribou abundance since 2005. The reduction coincides with the period when July surveys were dropped. Again, this would be clarified if the triggers for the surveys were included. It is unclear why there is no presentation or analysis of ENR’s satellite data. The tables are a poor presentation of data as they hamper annual comparisons – density/survey would be more useful than the total count.

5) Although the 2010 WEMP acknowledges that several recommendations were arrived at during the review meetings in September 2009 and June 2010 but except for dropping the pre-calving caribou aerial survey, the report does not include any other details for modifying programs (Marshall 2009, Handley 2010).

6) Table 2.3 has fewer and fewer species in consecutive monitoring reports without offering a clear explanation for why it now only lists species listed under the NWT Species At Risk Act. It is incorrect that the General Status Rank is provided by the NWT Species At Risk Act. The General Status Ranking program pre-dates SAR (NWT) Act as it was developed in 1999 to rank every 5 years the general status of all species, using a coarse/rapid procedure, with only readily available information. The rank of “may be at risk” can be (and has been) used by other processes to inform on which species could have priority for a more formal status assessment. It is these formal assessments that are mentioned in SAR legislation.

The 2010 WEMP also does not explain whether SAR listed species that occur within the study area receive any particular monitoring relative to any recovery or management plans which are required for species listed as Special Concern. The wildlife sightings for Snap Lake include the rusty blackbird which is listed under the NWT and federal Species AT Risk Act. Previous WEMP reports had included the olive-sided flycatcher and no reason is given for dropping it from the 2010 report (presumably because its distribution reduces the likelihood of its occurrence but this should be explained).

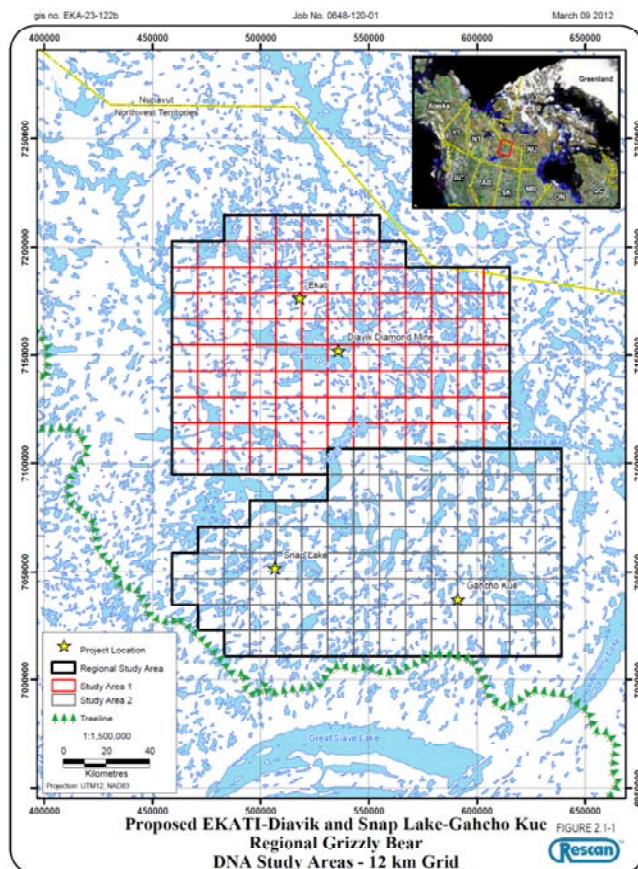
## **Recommendations**

1) The most efficient and effective approach for the 2012 multi-year comprehensive WEMP report is for SLEMA to be involved in providing suggestions prior to the analyses and report production rather than reviewing a final version. A collaborative approach will strengthen De Beer’s commitment to environmental protection while enhancing the role of community-based monitoring.

2) More detail is needed in presenting the information (examples are given in the specific comments) and reference to WEMP reports from Ekati and Diavik would be instructive.

## Joint Regional Grizzly Bear DNA Proposal 2012

In early 2012 SLEMA received a copy of a proposal, developed jointly by the three diamond mines, DeBeers, Ekati and Diavik. The purpose of the proposal was to seek approval for a joint regional grizzly bear study that would cover two study areas with a joint area of 30,500 km<sup>2</sup> and have 212, 12x12 km<sup>2</sup> cells. The study is partially based on previous work carried out in Nunavut and involved establishing a hair snagging station in each cell. The samples captured, with no harm to the bear will be sampled to determine individual bears, through DNA analysis. The data collected will be compared with existing databases in the NWT and be used to estimate population parameters.



**Map 2. Proposed Study Areas**



**Photo 3. Hair Snagging**

SLEMA reviewed this document and made the following comments:

- 1) SLEMA is concerned as to whether the responsibility for assessing and managing cumulative effects is being transferred to the Government of the Northwest Territories. SLEMA requires clarification on the responsibility for cumulative effects.
- 2) The proposal needs to explain and specify the reporting schedule for the individual mine annual wildlife monitoring reports and the periodic monitoring reviews.

**3)** It is unclear why the pilot work conducted by Rescan and others is not included to justify the survey design modeling expected results based on pilot study data. Please amend the proposal to include a summary of those results and any recommendations. The proposal is vague about data management. It is unclear what is meant by 'population' data being transferred to GNWT for assessment of cumulative effects and what will be the reporting requirements. This proposal needs to be specific about the data being transferred and the timeframe for its reporting. SLEMA is concerned that we could be left without access to the results of the monitoring.

**4)** Grid Cell Size: SLEMA notes that the Grizzly Bear DNA work conducted in Nunavut has developed a methodology based on a 10x10km cell size. A deviation from this method to a 12x12km cell may limit comparative analysis between the different study areas. While a 10x10km cell may be appropriate for Barren ground grizzly bear population estimate, the goal of this proposal is not to produce a population estimate but to provide information on local densities, seasonal distribution, movements, and trends in those. Therefore a different scale sampling may be justified.

**5)** Study Area: Considering that this is a joint proposal from 3 companies representing 4 mine sites, the study area is too small (approx. 30,000 km<sup>2</sup> which is about 7,500 km<sup>2</sup> per site). The southern study area could be slightly extended west and east and the northern study area could be slightly extended north and fully connect with the southern study area at McKay Lake. While the objective here is not to produce a population estimate, but rather a local density estimate and temporal/spatial trends, SLEMA suggests using the population delineation for female Barren ground Grizzly bear produced by McLoughlin et al as a guide for the study area boundaries. Very large lakes and water bodies can be used for the delineation of the study area as they represent temporary obstacle to movements and could help with population closure within the sampling time frame.

**6)** Survey Schedule: SLEMA supports the implementation of 6 sessions/year for the first two years as it will provide a stronger baseline for density estimate and subsequent trend analysis as well as other aspect of Grizzly bear behavior in the area (movements, seasonal distribution). However, SLEMA disagrees with the division of the study area into North and South for the establishment of the baseline. The study area as a whole (north + south) should be sampled in any given year. By dividing the study area into two, the proponent is steering away from the purpose of a joint proposal to monitor and address impacts at the appropriate scale.

**7)** Other Data Collection: Remote Cameras should be set up at a subset of hair snagging stations. This should be included in the proposal as it will provide valuable data that will provide some insight on behavioral (daily activity, association with other species) or demographic (age class or social status of individuals, litter size, recruitment) changes, and can be used as covariates in the Mark-Recapture models (capture rate of bears visiting the station, timing of visits over the sampling period, age class or social status of individuals).

**8)** The proposal does not explain about whether hair samples from other species especially wolverine will be analyzed or archived.

9) The proposal also does not acknowledge whether the sampling stations could also be integrated into aspects of the monitoring program for the mines. Given that the costs of the helicopter are so high, it is an opportunity for the mines to demonstrate an integrated wildlife monitoring program. SLEMA would be glad to contribute its experience and knowledge to expanding the efficiency of this proposal.

### Concerns regarding Mine Inspection Frequency

SLEMA monitors and reviews Aboriginal Affairs and Northern Development Canada's (AANDC) efforts to inspect the Snap Lake mine.

The AANDC mine inspector, from 2007 to 2011 made inspections frequently (approximately one inspection per month). After 2011 inspection frequencies diminished to about one every few months. Inspection response also became less frequent. SLEMA discovered that the mine inspector, who had originally been tasked with inspecting only Snap Lake, had been given an additional file and was also inspecting the Diavik Mine.

SLEMA felt that the inspection process was suffering and issued a letter to AANDC expressing its concern over the diminished inspection routine. AANDC responded to the letter and stated the following:

*"Thank you for your letter dated July 20, 2012 regarding a dedicated Inspector for the Snap Lake Mine Project, and the decline in the frequency of Inspections for this project.*

*The inspector who was dedicated to the Project requested a re-assignment from this file to the Diavik Diamond Mine Project and staffing efforts have been underway for some time to fill the void that was created.*

*The Manager responsible has been seeking a properly qualified and motivated Individual to replace the individual previously assigned to the project. While the federal public service staffing process can at times seem slow, I am sure you will agree that it is very important to attract and select the best possible candidate for such an important position.*

*In the meantime, I agree that the matter has become more pressing with the recent water management issues. I wish to assure you that AANDC takes its responsibilities for the northern environment very seriously, and is committed to ensuring all activities take place in accordance with the principles of sustainable development.*

*Although there may be a decline in the number of inspections conducted at various stages of an operation, we ensure each operation is monitored in a careful and considered manner using a risk assessment process that has been developed over a number of years. This assessment process is used in a consistent manner to manage our inspection functions, and ensures due diligence has been followed. The number of inspections done for any given operation is determined by this process which we will continue to apply in a manner that ensures protection of the environment."*



## **Air Quality, Meteorological Monitoring and Emissions Reporting 2011 Annual Report**

The Report was submitted on April 30, 2012.

- *“Consolidation of the 2011 particulate monitoring data indicates substantial challenges with the particulate monitoring program in 2011. Effort is currently under way to improve the success of the particulate monitoring program”.*
- Concentrations of NO<sub>2</sub> and SO<sub>2</sub> were well below the related guideline criteria.
- Emission rates were higher in 2011 than 2010 primarily due to an overall increase in fuel consumption, but emissions remained below the 2007 Air Modeling Update.

SLEMA is concerned with the poor data collection of total precipitation (rainfall and snow) and particulate monitoring. It is recommended that De Beers improve the data collection of total precipitation and particulate monitoring. Apart from these concerns there are no further issues.

## **Water Licence**

Water Licence MV2001L2-0002 expired in April 2012, and then it was extended for 60 days for the review and approval of new Water Licence MV2011L2-0004.

Type “A” Water Licence MV2011L2-0004 was approved the Minister of AANDC on May 23, 2012 as recommended by the MVLWB. The effective date was June 14, 2012, and expiry date will be June 13, 2020.

## **SLEMA Comments during the Renewal Process for Water License MV2011L2-0004**

SLEMA was engaged significantly in water license process, throughout 2011 and 2012. Concerns were expressed in the technical sessions and public hearing, and comments were made prior to and after the draft license was submitted.

When presented with the final draft of the water license in early 2012, SLEMA was pleased to see that many of its earlier comments were adopted. Some items, such as Water License term, security deposit amount, some Water Quality Objectives, and some submission due dates, were not specified, which caused some concern, but in all the draft Water License was satisfactory.

SLEMA had made a number of recommendations in October 2011, most of which were adopted. The comments were as follows;

- SLEMA recommended that Chloride and Fluoride be added into the list of Water Quality Objectives. Both were adopted into the draft water license and now are part of the operating water license.
- SNP station 02-03 sampled runoff from water management pond. This station was covered by kimberlite ore stockpiles. When deactivating the station SLEMA had made the following comments
  - The setup of SNP 02-03 is meaningful.

- Temporary termination of SNP 02-03 is acceptable. The monitoring station has to be re-established after the ore is processed.
- Permanent termination of the monitoring station can be considered during Water License renewal.

SLEMA then recommended that SNP 02-03 be reactivated in the new water license. This was done.

- Dissolved Oxygen (DO) levels were predicted to decline around the diffuser in ice covered periods. These levels actual increased. As DO levels were not measured in the effluent, SLEMA recommended adding DO into the measurement list for SNP 02-17. This recommendation was adopted into the new water license.
- SNP station 02-18 was not clearly defined in the old water license. SLEMA recommended a clear definition for this station. This recommendation was adopted.
- Since 2006 there have been a number of unintentional discharges from the north pile waste ore storage cells. SLEMA recommended more stringent requirements for the North Pile operation, including monitoring of water levels in the sumps and water management pond to be included in the water license. As a result of the recommendations, DeBeers installed electronic surveillance sensors in some of the sumps, as well as installing visual markers in important sumps, better training for staff and more frequent inspections.



**Photo 4. Visual Marker in Temporary Sump #4**

- The North Pile was originally designed on the basis of processed kimberlite (PK) paste deposition. But as a result of technical complications the composition and viscosity was more a slurry than paste, and as a result more water has been deposited to the North Pile than it's original design had intended. SLEMA recommended that a special study or risk assessment be required in the new water license. This recommendation was adopted as a requirement, and De Beers did produce a report of risk assessment for the North Pile, which was submitted in September 2012. De Beers made impressive efforts in risk

assessment and management. SLEMA appreciates these efforts and hopes De Beers continue to manage the North Pile with great caution.

- De Beers was directed by the AANDC Inspector in 2011 to clean up the decommissioned Ammonium Nitrate storage pad, and De Beers complied. SLEMA recommended that De Beers take confirmatory soil samples, and that in the new water license De Beers be required to take confirmatory samples around any site following remediation. De Beers did take the confirmatory soil samples, which did show elevated Ammonium and nitrates, but below accepted guidelines. The recommendation was not adopted into the water license as it is standard procedure to take the samples.
- De Beers requested a 15 year term for the new water license. SLEMA disagreed. Due to elevated fluoride levels that are predicted to remain high until 2016 and TDS levels predicted to exceed current water license limits by 2018, SLEMA recommended a term of 5 years. A number of other organizations also requested 5 years. AANDC recommended between 6 and 8 years. MVLWB decided on 8 years. SLEMA was not pleased with the board's decision, but given the incorporation of so many of SLEMA's comments and the general quality of the new license, and 8 years is much less than the proponent's original request SLEMA accepted this decision without dispute.

The following recommendations made by SLEMA were also adopted by the MVLWB:

- A special study of recently replaced diffuser for the purpose of assessing the performance of the outfall diffuser and the distribution of the diffuser plume in Snap Lake.
- The submission of electronic raw data for the Water License Annual Reports in Microsoft Excel format.
- Retain the term and condition about incorporation of Traditional Knowledge into the environmental management.

### **East Cell Spills 11-391 and 11-398**

On October 2, 2011, De Beers detected overland flow from a localized area near the sumps of the North Pie (East Cell). The water flowed overland to the Snap Lake shoreline and intermittently to Snap Lake itself. A second flow, approximately 80 meters west of the original flow was detected one week later. These flows were reported to the Spill Line as two separate spills and were catalogued as Spill 11-391 and Spill 11-398.

The cause of the two spills was described to be allowing the level of the perimeter sumps to be too high. This was a result of lack of capacity at the water treatment plant and elevated water flow from the underground mine.

Due to the fact of contaminated water spilling into Snap Lake, AANDC initiated an investigation against the two spills.



**Photo 5. Spills within the North Pile**

SLEMA issued a letter to the MVLWB stating that it was not surprised that these spills occurred. In 2009 SLEMA had issued two letters expressing concern that spills of this nature were likely to occur. Records had also shown that since May 2011 water levels in Perimeter Sump #4 (PS4) had 43 days that it was above its prescribed acceptable level and 17 days it was above the maximum allowable level and 15 days that it was above the level of Snap Lake. The failure to control the water levels in the perimeter sumps defeats the design purpose of the perimeter sumps, which require sump water levels much lower than Snap Lake to encourage back pressure. SLEMA made the following recommendations in a letter dated December 6, 2011.

- Environmental Management System (EMS) at the mine site has room to improve. The EMS audit reports should be considered as part of the reporting requirement of Water License Annual report.
- Current practices of water level control in the East Cell sumps appear to be deficient. Real-time water level control is recommended. It includes, but is not limited to, automated real-time water level monitoring and related dewatering schedule.
- Bog stations between the East Cell and Snap Lake shoreline of the Aquatic Effects Monitoring Program (AEMP) are important for timely seepage control of the East Cell. It is recommended to enhance field monitoring in these stations and add them into the Surveillance Network Program (SNP). Specific conductivity, pH and turbidity should be measured daily if applicable.



- Lessons learned from the spills should be incorporated into an updated Water Management Plan and the Monitoring Response Plan that is being developed.

De Beers responded on December 14, 2012, and thanked SLEMA for the letter. De Beers stated that “the objective analysis and constructive recommendations that it contains underscore the value of SLEMA as an independent monitoring agency for Snap Lake”. All recommendations were accepted by De Beers.

### **Starter Cell Spills 10-458, 11-460, 11-461, 11-469 and 12-014**

On December 10, 2010, water was observed on the access road north of Temporary Sump #4 (TS4), beyond the ditch collection system. There was approximately 110 m<sup>3</sup> of process water that seeped through the west side of the Starter Cell and flowed onto the access road. It was reported as Spill 10-458. A temporary diversion ditch was excavated to divert the water flow to TS4. Again on December 19, 2011 ice was noticed on the access road north of TS4. Approximately 1 m<sup>3</sup> of process water also came from the Starter Cell and flowed onto the access road. It was reported as Spill 10-458. Contaminated snow and ice on the road was removed and placed into TS4.

SLEMA made a comment on these two similar spills. In the follow up report for spill 10-458 a solution was recommended, involving the rerouting of the access road. This solution was not implemented and as a result a similar spill occurred the following year (spill 11-460). As a result SLEMA concluded that spill 11-460 was a result of lack of due diligence. SLEMA recommended that DeBeers re-examine the design of water collection system of the North Pile, correct any defects, and prevent similar spills from occurring.

Unfortunately, three more spills, 110461, 11-469 and 12-013, took place near TS4. Among them, Spill 11-469 was a significant one. Approximately 5,500 m<sup>3</sup> of water, originated from the Starter Cell, was found to overflow from TS4 and run outside of containment to the tundra, a distance greater than 100 meters from Snap Lake, on December 29, 2011. A containment berm was immediately constructed on the tundra to contain the spill; concurrent with this activity, a diversion ditch was dug from TS4 north toward Perimeter Sump #5 (PS5).

Due to the fact of reoccurring spills near TS4, AANDC initiated another investigation against these spills.

### **Toxicity Testing of Treated Mine Effluent Report**

In De Beers reporting for 2011 testing of treated mine effluent, of the five Ceriodaphnia (water flea) tests, one test showed adverse effect for mortality and four tests demonstrated an adverse impact on reproduction. During the Water Licence Renewal process De Beers was requested to present all the testing data between 2005 and 2010. Of the 25 Ceriodaphnia tests, three tests showed adverse effect for mortality and 15 tests demonstrated an impact on reproduction. As a result of this information SLEMA issued a letter to the MVLWB stating that



*"SLEMA is uncomfortable with the chronic toxicity testing results for Ceriodaphnia and De Beers responses to Information Request #6. SLEMA recommends that De Beers conduct further study on toxicity of treated mine effluent on Ceriodaphnia, and also would like to see one appropriate regulator, MVLWB or AANDC or EC or DFO thoroughly examine the toxicity testing results from 2005 to 2011."*



**Photo 6. Ceriodaphnia**

De Beers responded to the SLEMA letter with the following response.

*"As reflected on the record, the chronic toxicity data are being closely monitored by De Beers. As new data are obtained, such as the testing results from 2011, they will be evaluated against previous data to determine whether any trends are occurring. They will also be evaluated against related chemistry data to attempt to determine any correlations that could provide information for investigative studies."*

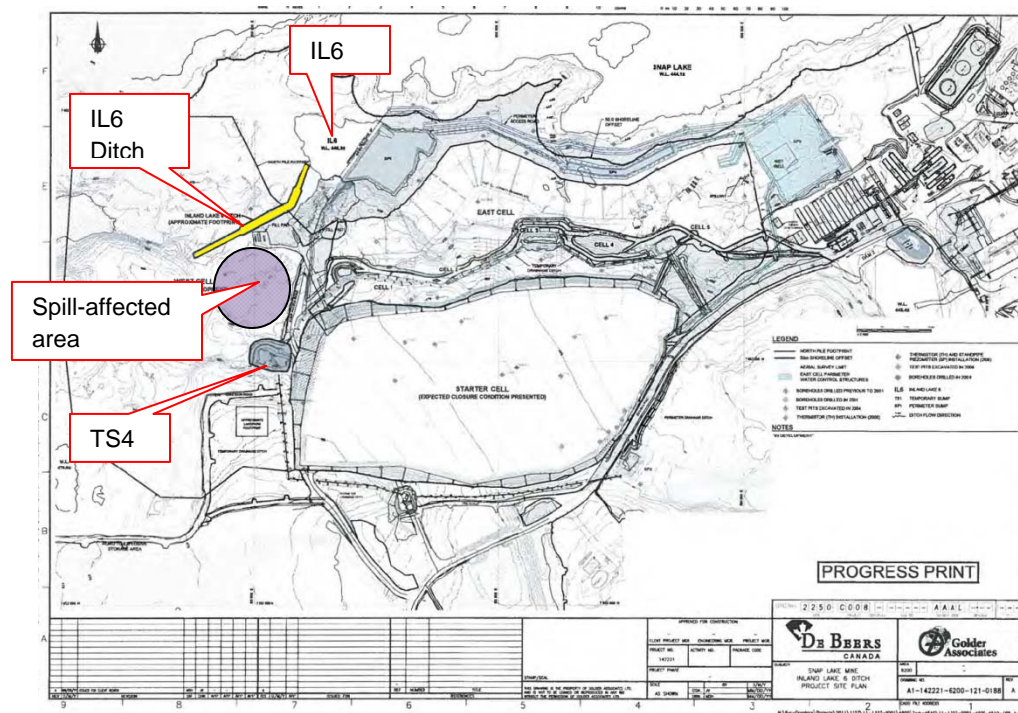
*De Beers has also agreed to conduct additional toxicity testing in the form of a 30-day rainbow trout egg/alvin test at the edge of the mixing zone, pursuant to Environment Canada Method EPS/1/RM/28. Environment Canada agreed that this is a reasonable test to begin with. Depending on the results, further investigations may be warranted.*

*The results and evaluations of chronic toxicity tests will be made available to stakeholders and regulators for review and comment as per the requirements of the water license. Stakeholders and regulators are, of course, entitled to undertake their own examinations of the toxicity testing results as they consider appropriate."*

### **Freshet Water Management and Mitigation Strategy and IL6 Ditch Design Report**

As a result of the spills (especially Spill 11-469) that occurred in and around the area of TS4 to the west of the North Pile (Starter Cell), the Freshet Water Management and Mitigation Strategy was developed, and a catchment or diversion ditch called IL6 Ditch was proposed. The IL6 Ditch is designed to intercept and collect surface water runoff and potential additional surge flows during the 2012 freshet period from the spill-

affected area to the north of TS4 for pumping to the Water Management Pond via Inland Lake 6 (IL6).



**Drawing 1. Starter Cell, East Cell and IL6 Ditch**

Initially SLEMA was concerned with the rapidity of the design and the request for approval without adequate consultation time, but as De Beers had been presented with a directive from the mine inspector to take action in preventing any further spills, SLEMA chose to provide the following comments.

*“IL6 will be used as a water management sump after the IL6 ditch is built, then the water level in IL6 should be maintained below 444.0 meters above sea level, which is the maximum design water level for Perimeter Sump #4 (SP4) and #5 (SP5).*

*Furthermore, one monitoring station between the shoreline and IL6 should be established to detect any possible seepage from IL6 to Snap Lake. In addition to the water level thresholds, a defined water alert threshold should be set up for the amount of mine water originating from the underground workings, to trigger the use of underground workings as temporary water storage.”*

The MVLWB approved De Beers Freshet Water Management and Mitigation Strategy with the conditions as recommended by SLEMA.

### **2011 Annual Mine Reclamation Status Report**

The objective of the Mine Reclamation Annual Report is to summarize the closure and reclamation activities conducted during the previous year. The 2011 Annual Report presents the variances from the original plan, updates the Reclamation Research Plan, summarizes the progressive reclamation activities in 2011, and proposes the Progressive Reclamation Plan for 2012.

SLEMA was pleased with this status report and felt it was much better production than previous reports.

### **Water Licence 2011 Annual Reporting**

SLEMA reviewed five annual reports and summarized its comments into one document. The following are SLEMA's comments:

- Water License 2011 Annual Report

SLEMA recommended that DeBeers report the compliance for each SNP station as in previous reports. SLEMA also noticed that some information was out of date and recommended it be updated.

- 2011 Acid Rock Drainage Annual and Geochemistry Monitoring Report

SLEMA found this report satisfactory and supported the recommendations in the report.

- 2011 Dam Inspection Report

An Engineer from Golder Associates Ltd. performed a site inspection and made a number of observations and recommendations which were appreciated by SLEMA.

SLEMA was concerned with the effectiveness of the mine site Environmental Management System (EMS/ISO 14001), which has been certified since the mine construction. SLEMA reaffirms a letter it issued in December 2011 that recommended that De Beers overhaul their EMS and submit the EMS audit report in a timely manner.

- Aquatic Effects Monitoring Program 2011 Annual Report (Water Quality)

SLEMA has been concerned about the uptrend of Total Dissolved Solids (TDS) levels in Snap Lake. The report promises a review of De Beers TDS modeling in 2013 which SLEMA anticipates.

Reporting of Water Quality and Fish Tasting is satisfactory. The efforts in targeted Water Quality Monitoring Programs, especially the Downstream Sampling Program, and application of Weight of Evidence approach in Quality Integration, were appreciated. No concerns were raised for 2011 AEMP Water Quality Monitoring.

- Stream-flow and Lake Elevation Monitoring Program 2011 Annual Report

SLEMA had no concerns regarding this report.

## SLEMA Modeling Update

SLEMA had conducted water quality modeling for TDS, Calcium and Chloride in 2010, and sent the results, related analysis and recommendations to the MVLWB on July 19, 2010 and September 2, 2010, respectively.

After two years, SLEMA updated the modeling with two more years of data (up to April 2012), deleted Calcium from the parameter list because it was not predicted in 2010 to exceed any action levels, and added Sulphate into the parameter list because it was a concern during the Water Licence Renewal process in 2011.

The modeling results indicated that the exceedance of WQO for Chloride is imminent, the exceedance of WQO for TDS is very possible, and the exceedance of WQO for Sulphate is also possible.

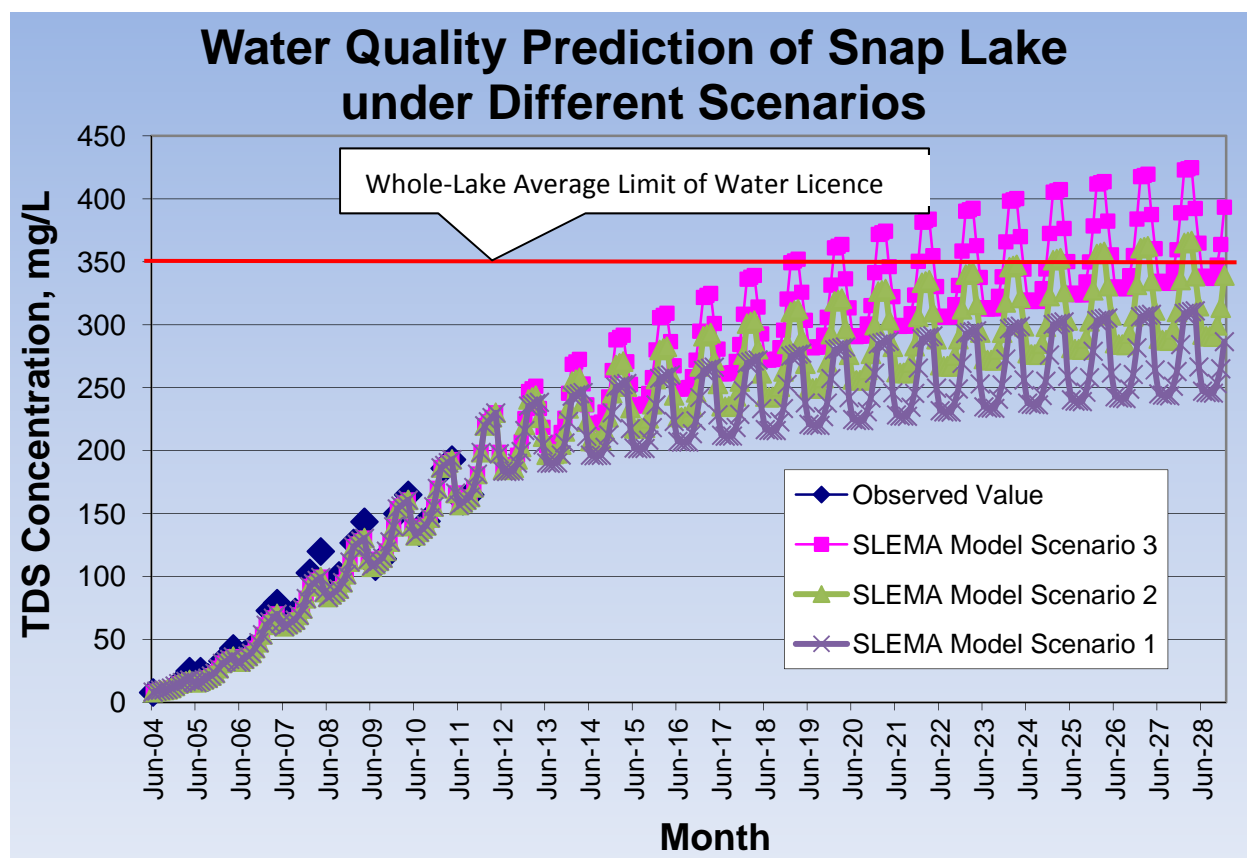
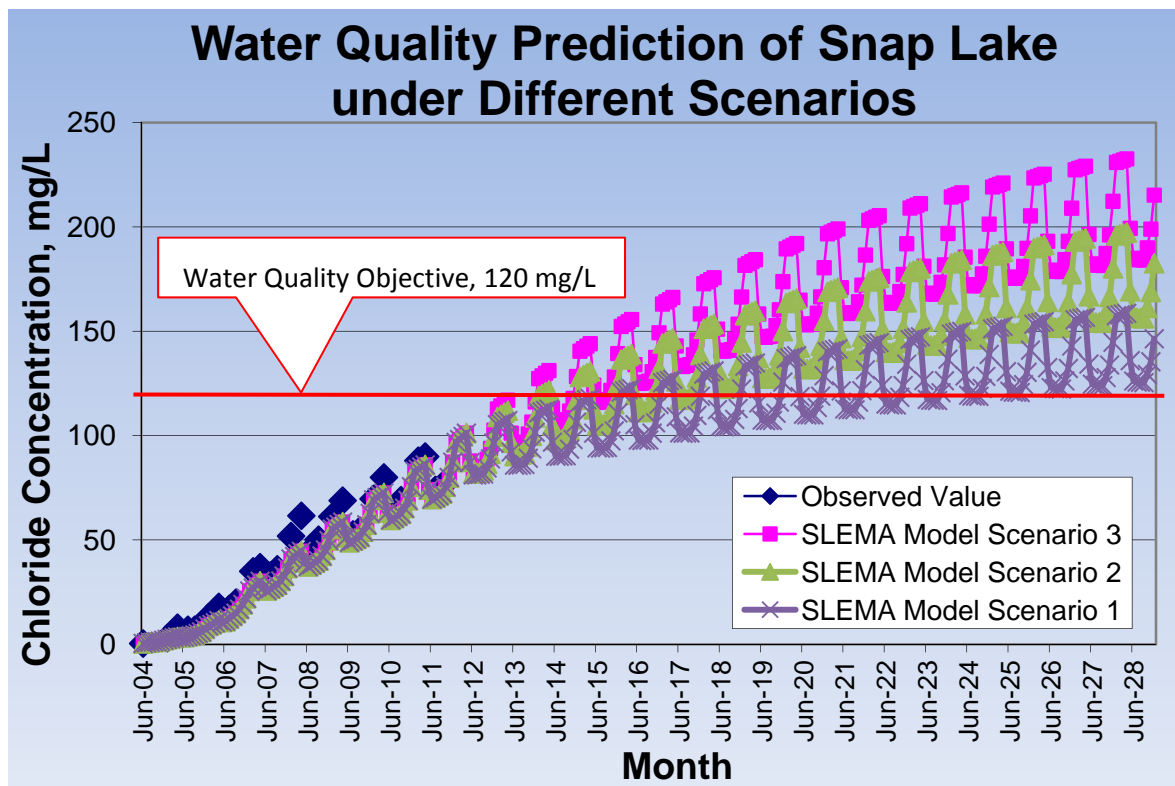
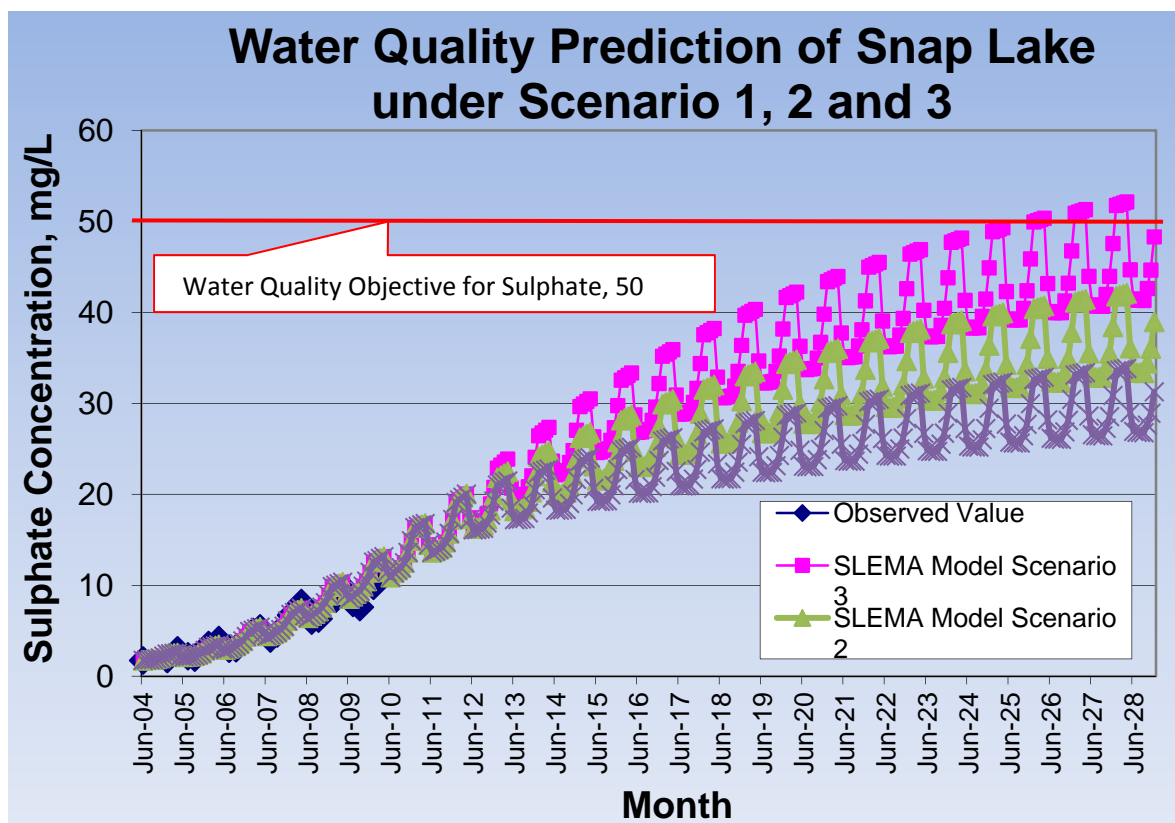


Chart 1. TDS Modeling Results



**Chart 2. Chloride Modeling Results**



**Chart 3. Sulphate Modeling Results**



## Land Use Permit

Current Land Use Permit is MV2010D0053. The effective date was February 16, 2011, and expiry date will be February 15, 2016.

## Fisheries Authorization

*Fisheries Act* Authorization SC-00-196 has been amended to reflect accepted fish habitat compensation, and to harmonize with the Aquatic Effects Monitoring Program required under Water Licence MV2011L2-0004 issued by the MVLWB. The purpose is to reduce reporting duplication for De Beers and other parties.

The Amended *Fisheries Act* Authorization, issued July 13, 2012, supersedes the previous Authorization, dated August 8, 2006.

## Mine Site Tour 2012

Mine site tour should have been an annual event for the community members to understand the Snap Lake Diamond Mine, its mining progress and environmental impacts. However, SLEMA has not been to the Mine, on a dedicated mine site tour since June 2009. As a result there has been much development that has occurred, and remains unseen by the majority of board members and elders. In early April SLEMA held a workshop and identified areas of the mine site that they would like to inspect. The areas are as follows:

- North Pile with a focus on the new construction of the East cell and the Inland Lake 6 Ditch. Also the locations of spills 11-391, 11-398, and 11-469.
- Water management pond with a focus on the dams and location of the spill 12-107 and 12-058.
- Ammonium Nitrate Storage Building
- Decommissioned Ammonium Nitrate Storage Pad
- Reclamation cover test plot
- Waste management area
- Fringe vegetation close to main roadways and alongside the runway (two or three locations)
- Area of the old accommodations: focus on future use of the area
- Fuel storage facility
- Water Treatment Plant: With a focus on issues preventing inadequate capacity and potential for future expansion possibilities.
- Locations where fox and wolverine died (as reported in the 2011 WEMP)

The day long tour was conducted on September 5, 2012. The participants included:

- SLEMA board members: Johnny Weyallon (Tlicho), Charlie Catholique (LKDFN), James Marlowe (LKDFN), Greg Empson (YKDFN), Hugh Mcswain (NSMA)
- Elders: Eddie Camille(Tlicho), Harry Apples(Tlicho), Eddie Jones (NSMA), Wayne Langenhan (NSMA), Melven Enge (NSMA)
- SLEMA staff: Dave White, Zhong Liu
- SLEMA Science Panel: Ann Gunn



**Photo 7. Water Samples within the WTP**



**Photo 8. Water Management Area**



**Photo 9. Perimeter Sump 3**



**Photo 10. Development of the East Cell**



**Photo 11. Sump of the AN Pad**



**Photo 12. AN Storage Building**

## **Fish Tasting 2012**

The fish tasting event has been a component of the Aquatic Effects Monitoring Program (AEMP) since 2005 and is enshrined in the Environmental Agreement and the Water License. It is the only traditional knowledge driven program in the environmental monitoring at Snap Lake, and takes place every year in September.

The fish tasting event for 2012 was held on September 13, 2012. The participants were:

- Elders: Nick Football (Tlicho), Philip Liske (YKDFN), Mike Francis (YKDFN), Wayne Langenhan (NSMA), Hugh McSwain (NSMA), John Catholique (LKDFN), Joe V. Catholique (LKDFN),
- Interpreter:: Lena Drygeese (YKDFN), Archie Catholique (LKDFN)
- Observers: David White (SLEMA), Zhong Liu (SLEMA)

The fishermen were Nick Football and Mike Francis. The fish caught, were a small 1 to 2 lb lake trout and a 4 to 5 lb lake trout. The fish was cut up and observed by the group (whether the fish are healthy with firm flesh and no major parasites or lesions). The main flesh of the fish was boiled and tasted. As reported to the two SLEMA employees by the elders, all participants had no issues with the taste of the fish. As observed by SLEMA, the fish tasting event was executed with regards to the protocols established by SLEMA and ratified by De Beers and Fisheries and Oceans Canada.





**Photo 13. Cutting Fish**



**Photo 14. Assessing Fish**



**Photo 15. Cooking Fish**



**Photo 16. Tasting Fish**

## **Assessment of the Mine**

De Beers generally ran the Snap Lake Diamond Mine in a way that maintains the majority of its environmental commitments from the reporting period of 2011-2012.

De Beers made efforts in the Nitrate Material storage, historic AN Pad reclamation, and replacement of malfunctioning diffuser, which SLEMA were concerned about last year. In addition, SLEMA appreciates the efforts De Beers made in the AEMP monitoring and reporting, i.e. the Downstream Sampling Program, and the application of Weight of Evidence approach in Quality Integration.

However, reoccurring spills revealed the serious challenges De Beers faced in water management. Spills took place within the footprints of the North Pile and the Water Management Pond, and at the diffuser outlet. It is strongly recommended that De Beers address the water treatment capacity issue and site water management issue.

SLEMA is also concerned about the potential of imminent exceedance of the WQO for Chloride, and recommends De Beers take reasonable actions to address this issue.

## Assessment of Regulators

SLEMA not only monitors the environmental performance of De Beers Snap Lake Diamond Mine, but also the government agencies that regulate the Mine. The regulators remain effective in making sure that De Beers runs the Mine in a way that maintains the majority of its environmental commitments.

**Mackenzie Valley Land and Water Board (MVLWB):** The MVLWB ran well managed processes for the Water Licence Renewal from 2011 to 2012. SLEMA was pleased when the MVLWB decided not to approve the last version of the Interim Closure and Reclamation Plan (ICRP), instead, laid out a process for De Beers to undertake to develop closure criteria, closure options and related reclamation research for the effective reclamation of the Mine.

**Aboriginal Affairs and Northern Development Canada (AANDC):**

The AANDC inspector showed great diligence and initiative. He issued a series of directions and warnings to address the non-compliances such as the AN Pad reclamation, exceedances of Water Licence criteria, and spills at the Mine for De Beers to take actions to maintain environmental performance. AANDC also contributed to the review of the draft Water Licence, 2011 Mine Reclamation Status Annual Report, and the ICRP.

SLEMA is concerned about the declined frequency of inspections, and looking forward to a return of a dedicated inspector assigned to the Snap Lake Diamond Mine and a return of monthly inspections.

**Department of Fisheries and Oceans (DFO):** DFO has been actively monitoring the fish habitat compensation projects in Snap Lake. DFO also contributed to the review of the draft Water Licence, toxicity testing, and the ICRP.

**Environment Canada (EC):** EC contributed to the review of the ICRP and the draft Water Licence MV2011L2-0004.

**Department of Environment and Natural Resources (ENR/GNWT):** ENR has been involved in the review of waste management issues and air quality issues.

Overall SLEMA is pleased with the regulators actions and responses in regards to Snap Lake.



## Summary of SLEMA Comments from 2011 to 2012

The comments and recommendations for those documents reviewed by SLEMA from 2011 to 2012 are summarized as follow.

**Summary Table of SLEMA Comments from 2011 to 2012**

| Date       | Addressee | Concern  | Subject         | Comment   | Recommendation   | Feedback/Response  |
|------------|-----------|----------|-----------------|---|--|--|
| 10/12/2012 | MVLWB     |          | North Pile      | De Beers made impressive efforts in risk assessment and management. SLEMA appreciates these efforts and hopes De Beers continue to manage the North Pile with great caution.  | It is not clear, whether De Beers established sampling stations between the sumps and Snap Lake to monitor potential seepage from the North Pile. Or whether they regularly inspected these sampling stations and took water samples. If not, it is recommended De Beers to do so. |  |
| 09/21/2012 | MVLWB     | Chloride | Modeling        | SLEMA updated the water quality modeling initiated in 2010. The modeling results indicate that the exceedance of WQO for Chloride is imminent, the exceedance of WQO for TDS is very possible, and the exceedance of WQO for Sulphate is also possible. | SLEMA believes the modeling results may help the MVLWB in the file of Snap Lake Diamond Mine.  |  |
| 07/20/2012 | AANDC     |          | Mine inspection | SLEMA has been concerned for some time about the diminishing frequency of inspections of the Snap Lake Mine and the increased burden on the mine inspector.   | SLEMA would like to see a return to dedicated inspectors to each of the mines and a return of monthly inspections.   | AANDC responded on August 3 that staffing efforts have been under way for some time to fill the void that was created. |

### Summary of SLEMA Comments from 2011 to 2012

| Date       | Addressee | Concern | Subject               | Comment   | Recommendation  | Feedback/Response   |
|------------|-----------|---------|-----------------------|---|---|---|
| 07/20/2012 | MVLWB     |         | 2011 annual reporting | <ul style="list-style-type: none"> <li>• 2011 WLAR<br/>No summary of compliance at each SNP station.</li> <li>• 2011 ARD<br/>No concerns are raised. The report recommendations are supported.</li> <li>• 2011 Dam Inspection Report<br/>The Report provides evidence for SLEMA to question the effectiveness of mine site certified Environmental Management System (EMS/ISO 14001: 2004)</li> <li>• 2011 AEMP<br/>Reporting of Water Quality and Fish Tasting is satisfactory. The efforts in targeted Water Quality Monitoring Programs, especially the Downstream Sampling Program, and application of Weight of Evidence approach in Quality Integration, are appreciated. No concerns are raised for 2011 AEMP Water Quality Monitoring.</li> <li>• 2011 Streamflow and Lake Elevation<br/>No concerns are raised.</li> <li>• 2011 Air Quality<br/>SLEMA is concerned with the poor data collection of total precipitation (rainfall and snow) and particulate monitoring.</li> </ul> | <p>De Beers to provide compliance summary in the report</p> <p>De Beers to overhaul their EMS, and De Beers to submit their EMS audit report in a timely manner.</p> <p>De Beers to improve the data collection of total precipitation and particulate monitoring. Apart from these concerns there are no further issues.</p> | <p>The MVLWB responded on August 30 and confirmed that De Beers shall submit the Engineer's Field Report 60 days following the inspection and provide the full Geochemical and Geotechnical Report with the WL Annual Report., and fully address the issues raised in the 2011 Engineer's Field Report and present the results/findings as part of the 2012 Engineer's Full Report by March 31, 2013.</p> |

### Summary of SLEMA Comments from 2011 to 2012

| Date        | Addressee | Concern | Subject          | Comment   | Recommendation   | Feedback/Response  |
|-------------|-----------|---------|------------------|---|--|--|
| 05/14 /2012 | De Beers  |         | Wildlife         | <ul style="list-style-type: none"> <li>Joint Regional Grizzly Bear DNA Proposal</li> </ul> <p>SLEMA would like to express its satisfaction that DeBeers is taking concrete steps towards participating in regional initiatives.</p> <p>SLEMA has concerns on the responsibility for assessing and managing cumulative effects, reporting schedule, data management, etc.</p>    | Recommendations were made for Grid Cell Size, Study Area, Survey Schedule, Other Data Collection, etc.   | De Beers responded on May 30, 2012, restated De Beers support and clarified De Beers position on the program   |
| 04/10 /2012 | MVLWB     |         | Recla-<br>mation | <ul style="list-style-type: none"> <li>2011 Reclamation Status</li> </ul> <p>The submission is much better than previous annual reporting of mine reclamation status, and SLEMA appreciates De Beers efforts.</p>   |  |  |
| 03/01 /2012 | MVLWB     |         | WL<br>Renewal    | <ul style="list-style-type: none"> <li>Draft WL Terms and Conditions</li> </ul> <p>Although some items, such as Water Licence term, security deposit amount, some WQOs and EQCs, and some submission due dates, are not specified, the draft Water Licence is satisfactory. SLEMA appreciates MVLWB's consideration of some recommendations SLEMA made on October 18, 2011.</p> | SLEMA further requests MVLWB's consideration of SLEMA recommendations dated December 6, 2011. Detailed comments and recommendations are attached in the comment table. | Corrections about nitrate and ammonia loading in Part F, Item 9 were made on May 1, 2012 after SLEMA pointed out on April 26 via e-mail. The MVLWB issued Water Licence MV2011L2-0004 on May 25. The Licence was approved for a period of 8 years commencing June 14, 2012 and expiring June 13, 2020. |

### Summary of SLEMA Comments from 2011 to 2012

| Date       | Addressee | Concern | Subject       | Comment  | Recommendation  | Feedback/Response   |
|------------|-----------|---------|---------------|--|---|---|
| 02/28/2012 | MVLWB     |         | North Pile    | <p>The Freshet Water Management and Mitigation Strategy and Inland Lake 6 (IL6) Ditch Design Report were reviewed.</p> <p>IL6 will be used as a water management sump after the IL6 ditch is built, then the water level in IL6 should be maintained below 444.0 meters above sea level, which is the maximum design water level for Perimeter Sump #4 (SP4) and #5 (SP5)</p>  | <p>One monitoring station between the shoreline and IL6 should be established to detect any possible seepage from IL6 to Snap Lake, and defined water alert threshold should be set up for the amount of mine water originating from the underground workings, to trigger the use of underground workings as temporary water storage.</p>   | <p>The MVLWB approved on March 1, 2012 the Freshet Water Management and Mitigation Strategy as submitted. SLEMA recommendations were accepted by the MVLWB.</p> |
| 01/26/2012 | De Beers  |         | Wildlife 2010 | <ul style="list-style-type: none"> <li>2010 Monitoring</li> </ul> <p>The amount of explanatory detail is noticeably less than previous reports. Additionally, most of the same problems previously noted remain in the 2010 report.</p> <p>The level of detail prevents understanding of how the results contribute to the monitoring objectives.</p> <p>The level of systematic monitoring for wildlife in the local study area was low.</p> <p>The wildlife sightings log and the Incident reports are useful information even though the unknown level of effort for the sightings is a problem in interpreting any trends.</p> <p>The three listed objectives for caribou are vague.</p> | <p>The most efficient and effective approach for the 2012 multi-year comprehensive WEMP report is for SLEMA to be involved in providing suggestions prior to the analyses and report production rather than reviewing a final version. A collaborative approach will strengthen De Beer's commitment to environmental protection while enhancing the role of community-based monitoring.</p> <p>More detail is needed in presenting the information (examples are given in the specific comments) and reference to WEMP reports from Ekati and Diavik would be instructive.</p> | <p>De Beers responded to all the comments on May 2, 2012, provided explanations and accepted some recommendations.</p>  |

## Summary of SLEMA Comments from 2011 to 2012

| Date       | Addressee | Concern                    | Subject                     | Comment   | Recommendation  | Feedback/Response  |
|------------|-----------|----------------------------|-----------------------------|---|---|--|
| 01/04/2012 | MVLWB     | Toxicity testing           | AEMP                        | SLEMA is uncomfortable with the chronic toxicity testing results for Ceriodaphnia (19 out of 30 tests showed adverse effects on reproduction) and De Beers responses to Information Request #6 during Water Licence Renewal                           | De Beers to conduct further study on toxicity of treated mine effluent on Ceriodaphnia.<br>One appropriate regulator, MVLWB or AANDC or EC or DFO to thoroughly examine the toxicity testing results from 2005 to 2011.   | De Beers responded on Jan. 6, 2012, and would closely monitor the chronic toxicity data and agreed to conduct additional toxicity testing. |
| 12/30/2011 | MVLWB     | Spills in the Starter Cell | North Pile Water Management | Spill 10-458 and Spill 11-460 appear to share similarities. De Beers demonstrated a lack of due diligence.  | De Beers to re-examine the design of water collection system of the North Pile, correct any defects.  |  |
| 12/06/2011 | MVLWB     | Spills in the East Cell    | North Pile Water Management | SLEMA accepts the conclusion made by the report about Spill 11-391 and 11-398 and is looking forward to reviewing the on-going investigation report and monitoring report.<br>The two spills were preventable and should not be viewed as accidental. | EMS audit reports should be part of the reporting requirement of Water Licence Annual report.<br>Real-time water level control is recommended.<br>Specific conductivity, pH and turbidity should be measured daily in shoreline bog stations.<br>Lessons learned should be incorporated into updated Management Plan. | De Beers responded on Dec. 14, 2011 and accepted all recommendations.  |



## Acronyms

AANDC – Aboriginal Affairs and Northern Development Canada (after June 2011, previous INAC – India and Northern Affairs Canada)

AdMP – Adaptive Management Plan

AN – Ammonia Nitrate

ARD – Acid Rock Drainage

AEMP – Aquatic Effects Monitoring Program

CCME – Canadian Council of Ministers of the Environment

DFO – Department of Fisheries and Oceans

DKFN – Deninu Kue First Nation

DO – Dissolved Oxygen

EA – Environmental Agreement

EAR – Environmental Assessment Report

EC – Environment Canada

EQC – Effluent Quality Criterion

EMS – Environmental Management System

ENR – Environment and Natural Resources (GNWT)

GNWT – Government of the Northwest Territories

INAC – India and Northern Affairs Canada (before May 2011)

LKDFN – Lutsel Ke Dene First Nations

MVLWB – Mackenzie Valley Land and Water Board

NSMA – North Slave Metis Alliance

PK – Processed Kimberlite

SLEMA – Snap Lake Environmental Monitoring Agency

SNP – Surveillance Network Program

TDS – Total Dissolved Solids

TK – Traditional Knowledge

WLAR – Water Licence Annual Report

WQO – Water Quality Objective

YKDFN – Yellowknives Dene First Nations

## Financial Statements

**Snap Lake Environmental Monitoring Agency**

**Financial Statements**

**March 31, 2012**

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# **Snap Lake Environmental Monitoring Agency**

## **Financial Statements**

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**March 31, 2012**

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## **Independent Auditors' Report**

### **To the Shareholders of Snap Lake Environmental Monitoring Agency**

We have audited the accompanying financial statements of Snap Lake Environmental Monitoring Agency, which comprise the statement of financial position as at March 31, 2012, and the statements of operations, changes in net assets, and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

#### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian generally accepted accounting principles, and for such internal controls as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

#### *Auditors' Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the Agency's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Agency's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained in our audit is sufficient and appropriate to provide a basis for our audit opinion.

#### *Opinion*

In our opinion, the financial statements present fairly, in all material respects, the financial position of Snap Lake Environmental Monitoring Agency as at March 31, 2012, and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting standards.

**Yellowknife, Canada  
June 29, 2012**

**Chartered Accountants**



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## Snap Lake Environmental Monitoring Agency

### Statement of Operations

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| For the year ended March 31,                                  | 2012         | 2011         |
|---|--------------|--------------|
| <b>Revenue</b>  |              |              |
| De Beers Canada Mining Inc.                                   | \$ 505,000   | \$ 977,010   |
| Interest income   | -            | 605          |
| Transferred from deferred revenue                             | 487,133      | 352          |
| Transferred to deferred revenue                               | (476,991)    | (487,133)    |
|   | 515,142      | 490,834      |
| <b>Expenses</b>   |              |              |
| Accounting and legal  | 11,788       | 9,505        |
| Bookkeeping   | 9,450        | 9,450        |
| Consulting fees   | 2,688        | 34,914       |
| Honorarium  | 150,114      | 138,274      |
| Insurance   | 2,600        | 2,731        |
| Interest and bank charges                                     | 1,105        | 921          |
| Meetings-catering, translation, rentals                       | 27,261       | 18,657       |
| Meetings-travel and accommodation                             | 54,827       | 30,849       |
| Office and administration                                     | 21,125       | 18,765       |
| Rent  | 32,970       | 31,026       |
| Wages and benefits  | 197,147      | 187,247      |
|   | 511,076      | 482,337      |
| <b>Excess of revenues over expenditures before other item</b> | <b>4,066</b> | <b>8,497</b> |
| <b>Other expense</b>  |              |              |
| Investment in fixed assets                                    | 4,066        | 8,497        |
| <b>Excess of revenues over expenditures</b>                   | <b>\$ -</b>  | <b>\$ -</b>  |

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## Snap Lake Environmental Monitoring Agency

### Statement of Changes in Net Assets

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| For the year ended March 31,         | 2012      | 2011      |
|--------------------------------------|-----------|-----------|
| Net assets, beginning of year        | \$ 10,008 | \$ 7,690  |
| Excess of revenues over expenditures | -         | -         |
|                                      | 10,008    | 7,690     |
| Investment in fixed assets           | 4,068     | 8,497     |
| Amortization                         | (8,546)   | (6,178)   |
| Net assets, end of year              | \$ 5,530  | \$ 10,008 |

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## Snap Lake Environmental Monitoring Agency

### Statement of Financial Position

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| As at March 31,                          | 2012              | 2011              |
|--|-------------------|-------------------|
| <b>Assets</b>                            |                   |                   |
| <b>Current</b>                           |                   |                   |
| Cash                                     | \$ 512,132        | \$ 529,898        |
| Prepaid expenses                         | 5,971             | 8,029             |
|  | <b>518,103</b>    | <b>537,927</b>    |
| <b>Equipment (note 4)</b>                | <b>5,530</b>      | <b>10,009</b>     |
|  | <b>\$ 523,633</b> | <b>\$ 547,936</b> |
| <b>Liabilities</b>                       |                   |                   |
| <b>Current</b>                           |                   |                   |
| Accounts payable and accrued liabilities | \$ 41,112         | \$ 50,795         |
| Deferred revenue                         | 476,991           | 487,133           |
|  | <b>518,103</b>    | <b>537,928</b>    |
| <b>Net Assets</b>                        |                   |                   |
| <b>Investment in fixed assets</b>        | <b>5,530</b>      | <b>10,008</b>     |
|  | <b>\$ 523,633</b> | <b>\$ 547,936</b> |

Approved on behalf of the board:

\_\_\_\_\_ Director

\_\_\_\_\_ Director

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## Snap Lake Environmental Monitoring Agency

### Statement of Cash Flows

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| For the year ended March 31,             | 2012       | 2011       |
|--|------------|------------|
| <b>Cash provided by (used for)</b>       |            |            |
| <b>Operating activities</b>              |            |            |
| Excess of revenues over expenditures     | \$ 4,066   | \$ 8,497   |
| Change in non-cash working capital items |            |            |
| Prepaid expenses                         | 2,058      | (2,555)    |
| Accounts payable and accrued liabilities | (9,682)    | 14,080     |
| Deferred revenue                         | (10,142)   | 486,781    |
|  | (13,700)   | 506,803    |
| <b>Investing activity</b>                |            |            |
| Purchase of equipment                    | (4,066)    | (8,498)    |
| <b>Increase (decrease) in cash</b>       | (17,766)   | 498,305    |
| <b>Cash, beginning of year</b>           | 529,898    | 31,593     |
| <b>Cash, end of year</b>                 | \$ 512,132 | \$ 529,898 |

Supplemental cash flow information (Note 5)

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# Snap Lake Environmental Monitoring Agency

## Notes to the Financial Statements

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March 31, 2012

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### 1. Nature of operations

Snap Lake Environmental Monitoring Agency ("the Agency") is a non-for-profit organization incorporated under the *Societies Act* of the Northwest Territories. It is exempt from income tax under Section 149(1)(l) of the *Income Tax Act*.

The mission of the Agency is to oversee environmental management of the De Beers Snap Lake Diamond Project.

The Agency was incorporated and commenced operations on December 10, 2004.

### 2. Significant accounting policies

These financial statements are prepared in accordance with Canadian accounting standards for not-for-profit organizations. The significant policies are detailed as follows:

#### (a) Financial instruments- recognition and measurement

Section 3855 requires that all financial assets and financial liabilities be measured at fair value on initial recognition except for certain related party transactions. Measurement in subsequent periods depends on whether the financial asset or liability has been classified as held-for-trading, available-for-sale, held-to-maturity, loans and receivables or other liabilities. Financial instruments classified as held-for-trading are subsequently measured at fair value and unrealised gains and losses are included in net income in the period in which they arise. Cash has been classified as held-for-trading.

Available-for-sale assets are those non-derivative financial assets that are designated as available-for-sale or are not classified as held-for-trading, held-to-maturity, or loans and receivables. Available-for-sale assets are subsequently measured at fair value with unrealised gains and losses recorded in other comprehensive income until realized, at which time they will be recognized in net income. No assets have been classified as available-for-sale.

Held to maturity assets are those non-derivative financial assets with fixed or determinable payments and fixed maturity that the Agency has an intention and ability to hold until maturity, excluding those assets that have been classified as held-for-trading, available-for-sale, or loans and receivables. They are subsequently measured at amortized cost using the effective interest method. No assets have been classified as held to maturity.

Financial instruments classified as loans and receivables are non-derivative financial assets resulting from the delivery of cash or other assets by a lender to a borrower in return for a promise to repay on a specified date or dates, or on demand, usually with interest. These assets do not include debt securities or assets classified as held-for-trading. They are subsequently measured at amortized cost using the effective interest method.

Accounts payable and accrued liabilities are classified as other financial instruments and are measured at cost or amortized cost.



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# Snap Lake Environmental Monitoring Agency

## Notes to the Financial Statements

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March 31, 2012

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### 2. Significant accounting policies (continued)

#### (b) Equipment

Equipment is recorded at original cost plus any costs of betterment less accumulated amortization and excludes any assets not in current use. Amortization is calculated by the declining balance method at the annual rates set out in note 5.

#### (c) Investment in fixed assets

Investment in fixed assets represents the accumulated cost of acquired capital assets net of disposals and amortization.

#### (d) Revenue recognition

The Agency follows the deferral method of accounting. The Agency recognizes unrestricted contributions when they are received or receivable if the amount receivable can be reasonably estimated and its collection is reasonably assured. Restricted contributions are recognized as revenue when the terms and conditions are met. The portion of revenue related to projects not completed at year end is deferred. This will be brought into income as the goods and services are acquired. Contributions for projects for which unexpended funds must be reimbursed at the end of the fiscal year are shown as contributions repayable.

#### (e) Use of estimates

The preparation of financial statements in conformity with Canadian accounting standards for not-for-profit organizations requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the year. Actual results could differ from those estimates.

### 3. Future changes to significant accounting policies

#### **Adoption of accounting standards for not-for-profit organizations in Canada**

In December 2010, the CICA Accounting Standards Board released Part III of the CICA Handbook which summarizes accounting standards for not-for-profit organizations in Canada. Implementation of these standards for not-for-profit organizations that choose not to adopt international financial reporting standards is mandatory for fiscal years beginning on or after January 1, 2012, but earlier adoption is permitted. The Agency is reviewing the impact of the adoption of the accounting standards and has not yet made a decision which option to adopt.

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## Snap Lake Environmental Monitoring Agency

### Notes to the Financial Statements

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March 31, 2012

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#### 4. Equipment

|                        |        |           |                          | 2012           | 2011           |
|------------------------|--------|-----------|--------------------------|----------------|----------------|
|                        | Rate   | Cost      | Accumulated amortization | Net book value | Net book value |
| Furniture and fixtures | 20%    | \$ 9,925  | \$ 7,240                 | \$ 2,685       | 3,356          |
| Computer equipment     | 45/55% | 23,904    | 21,059                   | 2,845          | 4,020          |
| Computer software      | 100%   | 15,334    | 15,334                   | -              | 2,633          |
|                        |        | \$ 49,163 | \$ 43,633                | \$ 5,530       | 10,009         |

#### 5. Supplemental cash flow information

|                   | 2012       | 2011  |
|-------------------|------------|-------|
| Interest paid     | \$ (1,105) | (921) |
| Interest received | -          | 605   |

#### 6. Economic dependence

The Agency receives all of its contribution funding from De Beers Canada Mining Inc. Management is of the opinion that operations would be significantly affected if the funding was substantially curtailed or ceased.

#### 7. Commitments

The Agency has entered into a premise lease agreement commencing June 1, 2010 and expiring May 31, 2013 for \$2,640 per month plus GST (2013 year \$2,700 per month).

#### 8. Comparative figures

The financial statements have been reclassified, where applicable, to conform to the presentation used in the current year.

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# Snap Lake Environmental Monitoring Agency

## Notes to the Financial Statements

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March 31, 2012

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### 9. Financial instruments

The following section describes the Agency's financial risk management objectives and policies and the Agency's financial risk exposures.

#### Credit risk

Credit risk arises from the potential that a counter party will fail to perform its obligations. The Agency is exposed to credit risk from contributors. However, De Beers Canada Mining Inc. typically provides funding in advance which mitigates the risk.

### 10. Capital disclosure

The Agency's objectives when managing capital are:

- (a) To safeguard the Agency's ability to continue as a going concern, so that it can continue to benefit the Territory.

The Agency manages the capital structure in the light of changes in economic conditions and the risk characteristics of the underlying assets. The Agency monitors capital on the basis of working capital. Working capital is calculated as current assets minus current liabilities as follows:

|                     | 2012       | 2011       |
|---------------------|------------|------------|
| Current assets      | \$ 518,103 | \$ 537,928 |
| Current liabilities | 518,103    | 537,928    |
|                     | \$ -       | \$ -       |

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