



July 2015  
Environmental Update  
for SLEMA Board

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July 31, 2015

# Outline

1. Mine Update
2. Inspection Update
3. Regulators' Update
4. Aboriginal Update
5. Stakeholders' Update
6. Agency's Activities
7. SLEMA Reviews
8. Water Licence Amendment Application



# Acronyms

- AANDC – Aboriginal Affairs and Northern Development Canada
- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- CCME – Canadian Council of Ministers of the Environment
- CEQG – Canadian Environmental Quality Guidelines
- EC – Environment Canada
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- SSWQO – Site-Specific Water Quality Objective
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond



# 1.1 Mine Update – June 2015

- Production rate: 101.8% of its capacity (96,223 tonnes of kimberlite processed)
- 7,212 m<sup>3</sup> of water withdrawn from Snap Lake
- 1,462,559 m<sup>3</sup> of treated water discharged into Snap Lake
- 78,389 tonnes of coarse reject and 56,019 m<sup>3</sup> of slimes deposited in the North Pile
- 2 Reportable spills
- Water sampled in 8 monitoring stations
  - The monthly average for all parameters met compliance



# 1.2 Spill Reporting in July 2015

- No spill reports received in July 2015



## 2. Inspection Update

- Inspector – Jamie Steele
- Water Licence Inspection
  - May 27 and 28, 2015



# 2.1 Water Licence Inspection

- Inspection conducted on May 27 and 28, 2015, and reported on, July 24
- Inspected several outbuildings and Laydowns around site, North Pile West Cell grout curtain construction and Perimeter Road, Spill site for NT#15-176 (Sewage Spill at STP 2), Ammonium Nitrate Storage, Emulsion Plant, Underground Refueling Station, and Underground Lube Bay
  - Verified four items improved by De Beers from April 8/9 Inspection Report
- Some minor clean-up is still required around site after the spring melt





Photo 1 – Water World Building 53 – Laydown was clean and well organized. The pumps and evidence of spills in the area.



Photo 2 - Water World Building 53 – A containment tray used for hydrocarbon storage was filling with water and will need to be pumped out before it overflows.



Photo 4 – Fresh Air Raise – Some seepage from the fresh air raise is pooling up outside. The source of the seepage is not known by De Beers at this time. The area is being acted on a regular basis.



Photo 6 – Mechanical Shop 2 Building 51 – Equipment being parked outside the shop are placed on tarps as temporary containment to catch leaks.



Photo 8 – 10 Million Liter Tank Farm – The containment area was dry and no concrete tank farm will need to be covered as per the liner design.



Photo 10 – Fuel Farm Unloading Module Building 31 – Spill kits in place are fully stocked and easily accessible.





Photo 12 – Fuel Farm Unloading Module Building 31 – Area around the hose reel is heavily stained with hydrocarbons. Clean-up of the area is required.



Photo 13 – Fuel Farm LV Module Building 35 – Spill kit fully stocked and easily accessible.



Photo 16 – 500,000L Tank Farm – Containment berm around the fill up module is significantly damaged.



Photo 18 – 500,000L Tank Farm – Area within the main tank farm containment is significantly contaminated with hydrocarbons and requires a clean-up.





Photo 27 – STP 2 – NT Spill #15-176 - A 30 L sewage spill outside of the Sewage Treatment Plant resulted from a power outage. The spill site has been cleaned up.



Photo 29 – Laydown 1 – The laydown was very clean and well organized.





Photo 31 – Ammonium Nitrate Storage Building – The area around the AN Building was clean with no evidence of AN spillage.



Photo 32 – Emulsion Plant – The area around the Emulsion Plant and the offloading point for Ammonium Nitrate were clean with no evidence of spillage.





Photo 33 – North Pile West Cell – Perimeter Road for the West Cell is being constructed.



Photo 34 – North Pile West Cell – Organic soil removed from the West Cell Tote Road and grout curtain construction area had been placed within close proximity (<30m) of Snap Lake. The soil has since been removed and placed at the former AN storage pad to be used for reclamation research. Inspection showed that the soil did not get placed into the lake and there is no damage to the tundra underneath.

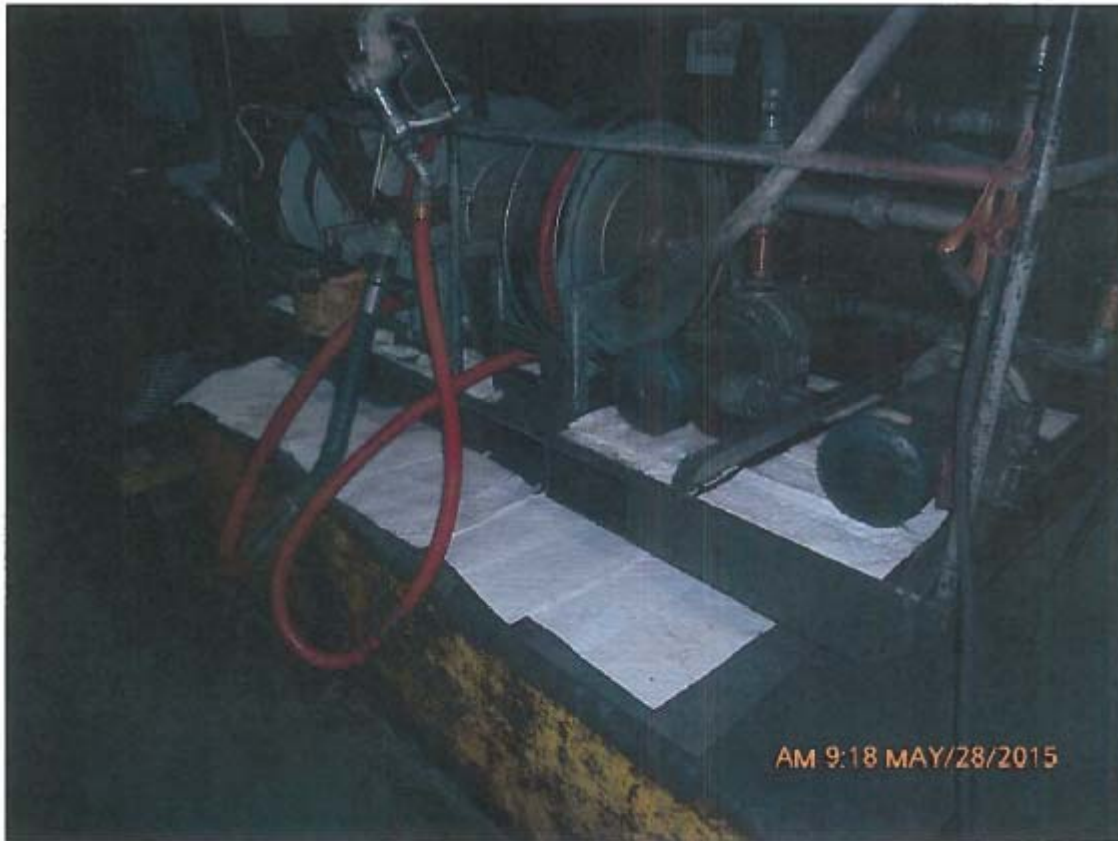


Photo 35 – Underground Refueling Bay – The Refueling Bay was clean and well organized. Fresh pads placed under the hose reels to collect any drips or leaks.

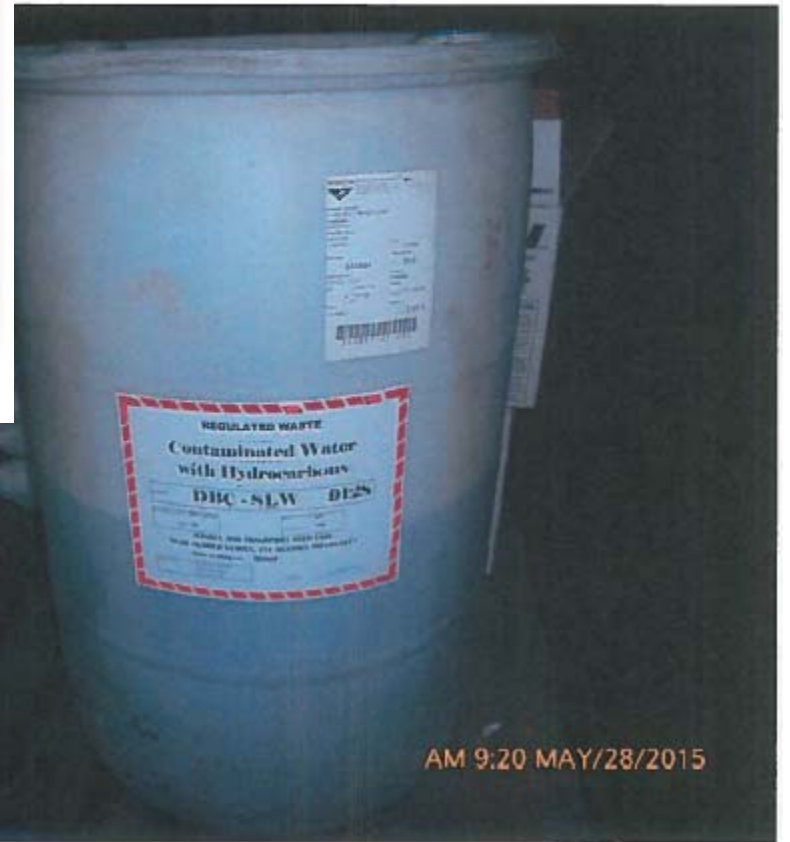


Photo 37 – Underground Fuel Bay – Drums are placed in the fuel bay to receive fuel or water from the containment sumps, ensuring that the sump has capacity for potential spills.

### 3. Regulators' Update – MVLWB (I)

- Board staff commented the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo on July 9, 2015
- Confirmed on July 21, 2015 that the requested changes as outlined in the Board's decision letter dated June 23, 2015 have been addressed. Therefore, 2014 WLAR can now be considered approved
- Acknowledged receipt of the 2014 Closure and Reclamation Annual Progress Report on July 23, 2015, and agreed with ENR that a security review needed to be conducted as part of the upcoming North Pile amendment application process



### 3. Regulators' Update – MVLWB (II)

- Approved the Downstream Watercourses Special Study Plan conditional on De Beers including a discussion on the statistical power of the Plan on July 23, 2015, and required
  - De Beers to submit the revised Plan by September 15, 2015
  - De Beers to submit an updated Plan, for approval, 90 days in advance of the commencement of their 2016, year 2, sampling program



### 3. Regulators' Update – MVLWB (III)

- Denied the Aquatic Effects Monitoring Program (AEMP) - Low Level Exceedance for Sub Lethal Toxicity in *Ceriodaphnia dubia* (*C. dubia*) Response Plan, based on reviewers concerns, on July 23, 2015, and requested that those concerns be further discussed at the upcoming Snap Lake Working Group Meeting and ultimately addressed as part of the updated AEMP Design Plan review process scheduled for later this Fall



# 3.1 Board Staff Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo

- The proposed new action levels at SNP 02-02 are not accompanied by rationale for the specific values (i.e. 200 mg/L for single sample, and 120 mg/L for the annual average) that are proposed. These action levels may be reasonable, but based on the information provided in the submission, it is not clear why these particular concentrations are considered suitable as action levels for this station. Although the relative nitrate contribution from SNP 02-02 to SNP 02-17b is illustrated, this does not clarify how actual nitrate concentrations at SNP 02-02 relate to concentrations in the final discharge (i.e. the dilution factor)



## 4. Aboriginal Update

- No comments received from the Aboriginal parties in July 2015



# 5. Stakeholders' Update (I)

- True North Safaris Ltd. commented the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo on July 1, 2015
- Environment Canada (EC) and Environment and Natural Resources (ENR) commented the 2014 AEMP Annual Report on July 2, 2015
- EC and ENR commented De Beers' Request to Change ELS Requirements of SNP on July 7, 2015
- ENR commented the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo on July 9, 2015



## 5.1 True North Safaris Ltd Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (I)

- True North Safaris and Mackay Lake Lodge are directly down stream from Snapp Lake
  - “We had asked DeBeers to involve us in the monitoring program and they have decided not. We are concerned that the sampling and testing that they do must be witnessed by an independent third party so that the test results are public and accurate. We have already witnessed fish difigurment on the King F since the Snap Lake mine emissions”



## 5.1 True North Safaris Ltd Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (II)

- “DeBeers should involve Mackay Lake Lodge and True North safaris in the monitoring program as we are directly down stream and have already witnessed effects from the mine including fish disfigurmwnt and changes to the caribou migrations. Independent third party verification of the sampling and testing results should be required”



# 5.2 EC Comments on the 2014 AEMP Annual Report (I)

- Due to the large amount of information presented in the report, tables would be useful to summarize the findings of each section
- Table 3.4-3 (Section 3 Page 3-50) indicates that bolded values were above the relevant benchmarks. A maximum total phosphorus of 0.032 mg/L is provided, which exceeds the Aquatic Effects Monitoring Program (AEMP) benchmark of 0.011 mg/L, but is not bolded. Given that bolded values indicate exceedances of benchmarks, the maximum value for total phosphorus should be bolded



## 5.2 EC Comments on the 2014 AEMP Annual Report (II)

- The report indicates that magnesium, barium, and uranium concentrations are above the updated whole-lake average predictions in 2014 (Section 3 Page 3-80 ). It is noted that these divergences in measured and predicted concentrations are due to model uncertainties
  - EC recommends that the Proponent discuss the uncertainties which are impacting the modelling. How will the model be updated in order to address these uncertainties?



## 5.2 EC Comments on the 2014 AEMP Annual Report (III)

- The summary for Key Question 3 indicates that a number of water quality parameters are continuing to increase above the Snap Lake normal range and/or the reference lake concentrations (Section 3 Page 3-147 )
  - EC recommends that the Proponent discuss which parameters are of concern, the severity of the increasing trend, and the level of concern. Are these parameters anticipated to level off or continue to increase?



## 5.2 EC Comments on the 2014 AEMP Annual Report (IV)

- The summary indicates that total and dissolved phosphorus concentrations are decreasing in the main basin of Snap Lake. This is opposite of the expected trend of increasing phosphorus that would be anticipated with the Total Phosphorus (TP) loadings (Section 3 Page 3-147 )
  - EC recommends that the Proponent discuss potential explanations for this trend in phosphorus. Is phosphorus anticipated decrease further?



## 5.2 EC Comments on the 2014 AEMP Annual Report (V)

- According to Figure 4.4-1, the concentrations of nitrate appear to have increased significantly in sediment in 2014 to roughly 14 mg/kg, from the previous temporal trend around 3 mg/kg. This sudden increase is not discussed in the report
  - EC recommends that the Proponent discuss explanations for the sudden increase in nitrate in sediments given that practices for nitrate management have improved and water quality concentrations have decreased



## 5.2 EC Comments on the 2014 AEMP Annual Report (VI)

- The report indicates that the benthic component was conducted in 2014 and will be conducted again in 2017. This appears to be an error as page 1-8 states that the benthic invertebrate community survey was last completed in 2012 and will be conducted again in 2015
  - EC recommends that the Proponent clarify and correct when the benthic invertebrate community survey was last conducted, and when the next sampling program will be completed



## 5.3 ENR Comments on the 2014 AEMP Annual Report (I)

- ENR recommends that a discussion on variance between current effluent discharge quantities and EA predictions related to effluent quantities be included in the AEMP report
- ENR recommends that De Beers provide a discussion on the observed decrease in Snap Lake outflow despite the increasing effluent quantities. This would help flag potential concerns that persist for several years and facilitate trend investigations, as required



## 5.3 ENR Comments on the 2014 AEMP Annual Report (II)

- ENR recommends that De Beers provide a discussion on potential pathways for the recycling of phosphorus into the water column of Snap Lake and outline any proposed investigations to support their assertion regarding phosphorus behavior in Snap Lake. ENR notes a similar trend was identified at Diavik through their AEMP and the focus of the assessment was correlations between total phosphorus in the effluent and chlorophyll *a* in the receiving environment



## 5.3 ENR Comments on the 2014 AEMP Annual Report (III)

- A column in Table 3.4-7 lists “maximum measured concentration” for a number of parameters however in relation to dissolved oxygen and pH it appears the value is the minimum measured concentration
  - ENR requests that the table be clarified to help interpretation of those not familiar with water quality data and associated risk



## 5.3 ENR Comments on the 2014 AEMP Annual Report (IV)

- Page 3-80 notes that uranium is 40% above predictions but remains below AEMP benchmarks. It is not clear how close uranium concentrations are to AEMP benchmarks or the rate at which they are increasing/trending
  - ENR recommends that De Beers provide a description of the AEMP benchmark for Uranium which includes the derivation or source of the benchmark
  - ENR recommends that for any parameter that falls above the EA predictions that it be compared to AEMP benchmarks and include an indication of trends



## 5.3 ENR Comments on the 2014 AEMP Annual Report (V)

- Section 5.4.4.2 notes that an increase in phytoplankton biomass was observed in both the northwest arm of Snap Lake as well as northeast lake at about 5-5.5x greater than baseline. This has been attributed to a cyanobacterial bloom. ENR is not aware whether there are similarities in the physical parameters of these two waterbodies (depth, temperature, etc) that could strengthen the assumptions that both waterbodies have been similarly affected
  - ENR recommends De Beers include a summary of any other similar characteristics between the northwest arm and northeast lake that may have contributed to the recent algal blooms observed in 2014



## 5.3 ENR Comments on the 2014 AEMP Annual Report (VI)

- ENR recommends that De Beers provide additional information/clarity regarding evidence suggesting that the Phytoplankton community shift observed previously in the main basin of Snap Lake may now be occurring in the northwest arm of Snap Lake
- ENR recommends that De Beers also provide any implications if the shift as described in the AEMP is occurring in the northwest arm of Snap Lake



# 5.3 ENR Comments on the 2014 AEMP Annual Report (VII)

- ENR requests that De Beers discuss potential factors that may have caused the reversal of the diatom community shift observed in Snap Lake. De Beers should include whether this shift is only temporary or if previous sample results have shown a trend in reverting back to the baseline community structure
- ENR recommends that De Beers clarify whether there has been a dominant species shift to *D. pulex* or if individuals within that species have become larger (Zooplankton Abundance vs Biomass)
- ENR recommends that De Beers provide a discussion on possible implications to higher trophic levels as a result of the dominance of the larger *D. pulex*
- ENR recommends that De Beers provide a discussion of the potential reasons and implications for the shift to larger sized zooplankton species



# 5.3 ENR Comments on the 2014 AEMP Annual Report (VIII)

- ENR requests that De Beers provide additional information on the factors considered in the edibility assessment
- ENR requests additional information regarding how the determination was made that the 2014 conductivity information may have been compromised
- ENR requests that De Beers further discuss the results and provide potential analyses of the sample locations and flow paths. This is important as it could inform the Downstream Watercourses Special Study
- ENR requests that De Beers provide an update on the status of the recommendations provided by Golder regarding work to be repeated in 2015
- ENR requests clarification from De Beers on its plans for the developing and implementing the Downstream Lakes Study forward and how this relates to the Downstream Lakes Special Study noted in the Water Licence



## 5.4 EC Comments on De Beers' Request to Change ELS Requirements of SNP

- EC did not oppose the proposed changes



## 5.5 ENR Comments on De Beers' Request to Change ELS Requirements of SNP (I)

- “At this time, ENR does not believe that enough evidence exists from the 1 comparative sample event (August 26, 2014) to warrant reduction of the toxicity testing requirements prescribed in the July 17, 2014 Board Decision.”
  - “ENR recommends that the MVLWB require at least one more year of testing of Rainbow Trout and Fathead Minnow. ENR believes that given the variability seen in the 3 tests, 1 of which was the side-by-side test, that at least one more year of side-by-side testing would be required to make an info decision.”



## 5.5 ENR Comments on De Beers' Request to Change ELS Requirements of SNP (II)

- “ENR recommends that De Beers also describe the concentrations of TDS and its constituents in the August 4th sampling event to help determine if the conditions were outside the normal operating range for the mine. The concentration for the August 26th sampling event should also be provided.”
- “ENR requests that De Beers further describe the logistical challenges it faced during the August 4th sampling event that prevented the testing of Rainbow Trout and any steps that have been taken by the company to avoid such challenges in the future.”



## 5.5 ENR Comments on De Beers' Request to Change ELS Requirements of SNP (III)

- “ENR recommends that the MVLWB require De Beers to continue the testing of Rainbow Trout and Fathead Minnow for at least one more year as the sensitivities of the two test species to various analytes in Snap Lake effluent is inconclusive.”



## 5.6 ENR Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (I)

- ENR requests DeBeers provide further scientific rationale for the suggested trigger levels and how they believe they would be adequate for the North Pile and the final discharge
- ENR request that De Beers determine the source of the nitrates that are seeping from the North Pile
- ENR requests that De Beers North Pile Management Plan must include interception and pumping this seepage and ultimately treatment prior to release/discharge to Snap Lake



## 5.6 ENR Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (II)

- ENR recommends DeBeers strategically plan and balance their industrial activities and production forecasts by maintaining compliance with their current Water Licence Nitrate EQC limit for treated effluent disposed into Snap Lake
- ENR recommends DeBeers pursue research into developing nitrate management practices suitable to the Snap Lake operations practices which should include alternate explosives, implementing blasting mitigations (double priming holes, prepackaged explosives, liners, etc.), water treatment, etc. to reduce nitrate loadings over time in Snap Lake



## 5.6 ENR Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (III)

- ENR recommends that DeBeers Response Framework “include Action Levels for parameters of concern to trigger additional sampling or other [adaptive management] activities”, as requested by the MVLWB in their October 2014 Staff Report
- ENR recommends the Response Framework include threshold EQCs and associated Actions Required for TDS via Chloride + Sulphate. This would ensure that Response Decisions would be based on actual monitoring results rather than calculations, ENR further recommends that chloride be the preferred parameter within DeBeers Response Framework. Recent assessment decision have not limited monitoring and mitigation to TDS alone but TDS and its constituents



## 5.6 ENR Comments on the North Pile Man. Plan Response Threshold - Nitrate Exceedance Memo (IV)

- ENR recommends that the Response Framework be updated and structured to foster inputs from recently reported data/trends (such as ARD/ML Reports) on Parameters of Concerns. Such linkages should allow appropriate Adaptive Management decisions to better manage the effluent discharge to Snap Lake
- ENR recommends the Board request that De Beers clearly indicate all modifications made and associated pages within each new/updated version of plans and submissions
- ENR recommends DeBeers update the Response Framework “Personal notified” section to include Inspector



## 6. Agency's Activities

- A comment letter on the 2014 AEMP Annual Report was sent to the MVLWB on July 2, 2015
- A comment letter on the Nitrate Action Levels was sent to the MVLWB on July 9



# 7. SLEMA Reviews

- Summary is provided for the two report without comments
  - 2014 Annual Wildlife Effects Monitoring Program (WEMP) Report
  - 2014 Annual Wildlife and Wildlife Habitat Protection Plan (WWHPP) Report
- 2014 Air Quality Meteorology Monitoring and Emissions Annual Report



# 7.1 2014 Annual Wildlife Effects Monitoring Program (WEMP) Report

- Submitted on March 30, 2015
  - The WEMP Report describes wildlife monitoring occurring at spatial scales beyond the Mine footprint



# Report Summary (I)

- Through 2014, the effects of the Mine to wildlife have been within the range predicted in the Environmental Assessment Report (EAR). In 2014, the monitoring of caribou and bears indicated low levels of interaction with the Mine by these species compared to other operating mines in the NWT



# Report Summary (II)

- Caribou pass through the regional study area and have been occasionally observed at the Mine. Caribou are monitored through the movements of satellite-collared animals, observations by employees at the Mine and with aerial surveys by helicopter. The number of caribou observed has been very different from year to year since surveys began in 1999 and likely reflects the reduced herd size of Bathurst caribou. In 2014, an aerial reconnaissance survey was completed and determined that there were not enough caribou groups to complete behavioural scan surveys



# Report Summary (III)

- In 2013 and 2014, De Beers (on behalf of the Mine and the Gahcho Kué Project) participated in a regional grizzly bear program in collaboration with Dominion Diamond Ekati Corporation and Diavik Diamond Mines Inc. that will help the GNWT monitor and assess cumulative Effects



# Report Summary (I)

- In 2013 and 2014, De Beers, on behalf of the Mine and the Gahcho Kué Project, participated in a regional wolverine program that will provide demographic information for the conservation and management of wolverines in the NWT



## 7.2 2014 Annual Wildlife and Wildlife Habitat Protection Plan (WWHPP) Report

- Submitted on March 30, 2015
  - The WWHPP Report describes wildlife monitoring occurring at and immediately adjacent to the Mine



# Report Summary (I)

- Wildlife habitat loss due to the expanding Mine footprint has occurred as expected and the Mine as of 2013 was approximately 89 percent (%) of the total predicted size. The Mine is now nearing the maximum predicted footprint and further changes are mostly associated with the expansion of the North Pile. As such, the Mine footprint will be assessed less frequently, with the next Mine footprint assessment scheduled for 2017



# Report Summary (II)

- Incidents are defined as any wildlife interaction that requires a response by Mine personnel and may range from simple deterrent actions to the injury or death of an animal. Eighteen wildlife incidents were recorded at the Mine in 2014. These incidents included six involving wolverines, five involving birds, six involving fox and one involving an Arctic hare. Wildlife mortalities have been infrequent at the Mine. In 2014 eight wildlife mortalities were recorded at the Mine and included one wolverine, four birds, two foxes and one Arctic hare. Worker education, effective mitigation and good waste management have been considered essential in the reduction of wildlife incidents and mortalities since the initiation of Mine operations



# Report Summary (III)

- Caribou pass through the regional study area and have been occasionally observed at the Mine. Their presence at the Mine are monitored through observations by staff at the Mine and communicated to employees for the protection of caribou



# Report Summary (IV)

- In 2014, the Mine continued regular inspections by the environmental department for the presence of wildlife, wildlife sign and food waste around the exterior of the airstrip, North Pile, accommodation complex, emulsion plant, power plant and water treatment plant and waste management areas. The results of inspections indicated that 21.63 percent (%) of surveys recorded presence of wildlife, 22.34% wildlife sign and 1.06% food waste at these Mine areas. Over time, the results of these surveys provide a standardized measure of wildlife presence at the Mine and the effectiveness of the waste management system



# Report Summary (V)

- Regular monitoring for wildlife presence, wildlife-traffic collisions, public use and wildlife harvest along the Mine winter access road began in 2013 and was continued in 2014. Wildlife detected near the Mine winter access road were ravens, caribou and a red squirrel. Evidence of wildlife-vehicle collisions was not observed nor were any reported to the Mine. Public use or wildlife harvest along the winter access was not observed during any of the surveys



# 7.3 2014 Air Quality Meteorology Monitoring and Emissions Annual Report

- Submitted on May 29, 2015
  - This report provides the results of the air quality and meteorological monitoring programs that were active at Snap Lake during 2014



# Air Quality and Meteorological Monitoring Stations



# Air Quality and Meteorological Monitoring Stations

1. TSP Partisol 1, Dichotomous PM10/PM2.5 Partisol 1 (pre-July 2014), 5030 SHARP PM2.5 Monitor PM001 (November 2014 onwards), Airstrip Passive Monitoring Site
2. TSP Partisol 2, Dichotomous PM10/PM2.5 Partisol 2 (pre-July 2014), 5030 SHARP PM2.5 Monitor PM002 (November 2014 onwards), Ammonium Nitrate Fuel Oil Area (Explosives Emulsion Plant) Passive Monitoring Site
3. West Shore Snap Lake Passive Monitoring Site
4. North Shore Snap Lake Passive Monitoring Site
5. TSP Partisol 3, Wetlands Passive Monitoring Site
6. Tank Passive Monitoring Site
7. Landfarm Passive Monitoring Site
8. Hill Meteorological Monitoring Station
9. Lake Hydro-Meteorological Monitoring Station



# Meteorological Monitoring

- 2014 quarterly wind patterns were similar to 2013
- Monthly air temperature averages and relative humidity measured at Snap Lake were consistent with patterns and ranges measured in Yellowknife
- Annual peak solar radiation occurred in June, consistent with previous years
- The total annual rainfall recorded at the Hill Station in 2014 was 107.7 millimetres (mm), slightly higher than the Yellowknife total for 2014 (104.6 mm) but lower than the Yellowknife long-term (1981 to 2010) annual rainfall average of 170.8 mm

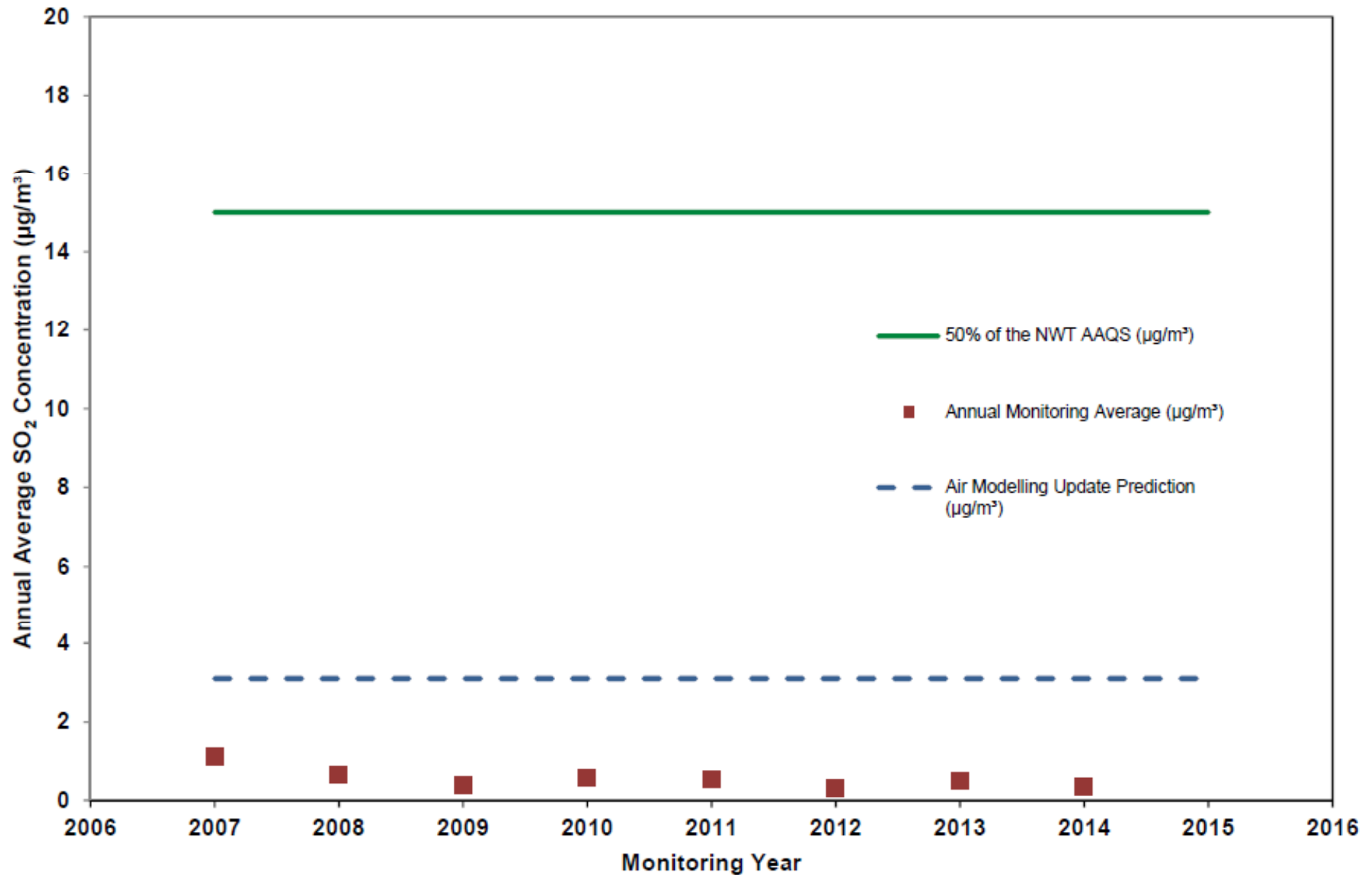


# Passive Monitoring

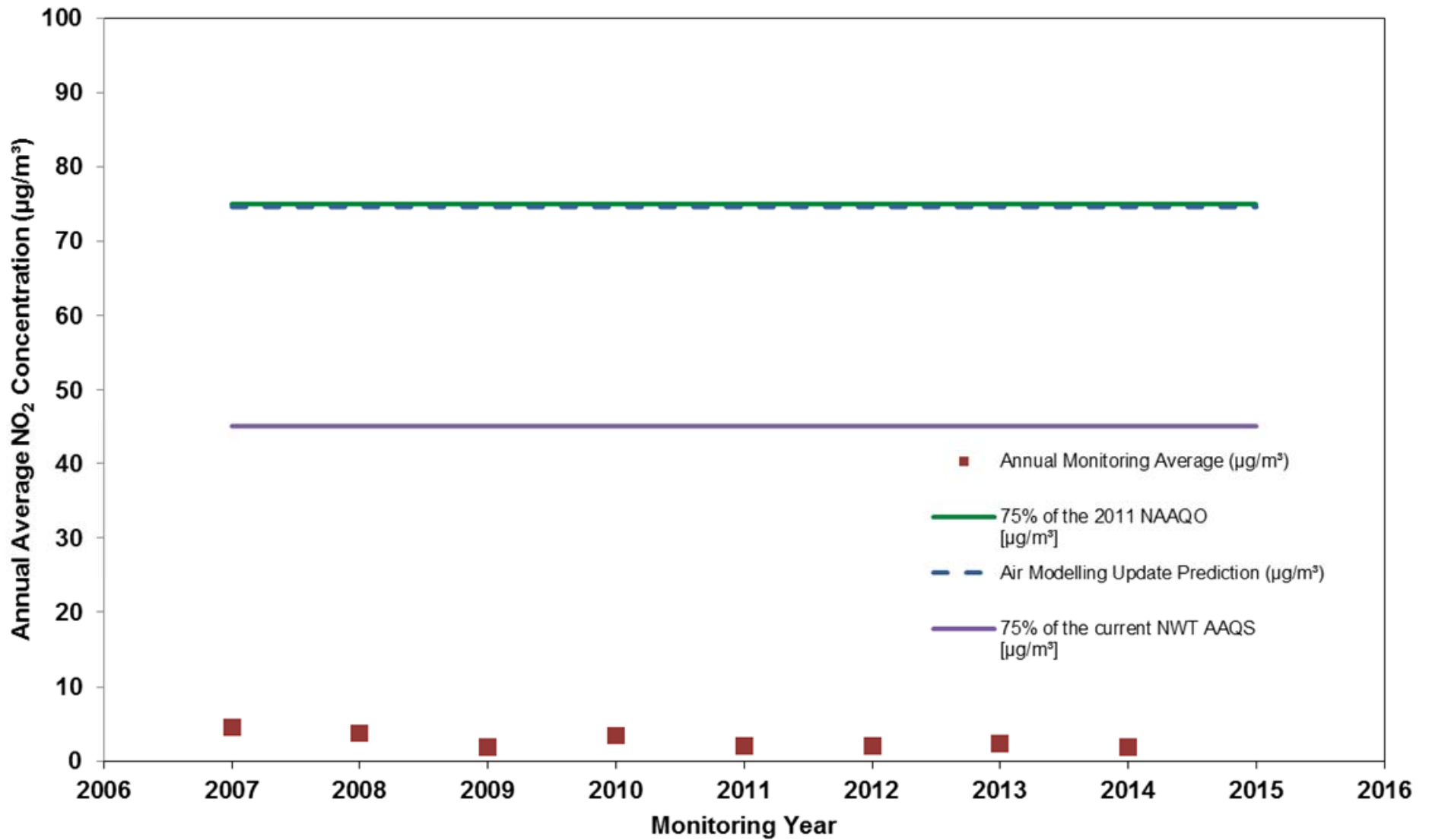
- The passive monitoring of SO<sub>2</sub> and NO<sub>2</sub> in 2014 indicated concentrations well below the applicable criteria
  - The annual average SO<sub>2</sub> concentration is 0.4 micrograms per cubic metre (µg/m<sup>3</sup>), which is a decrease of 0.1 µg/m<sup>3</sup> from 2013 and below the Northwest Territories (NWT) Ambient Air Quality Standards (AAQS) of 30 µg/m<sup>3</sup>
  - The annual average NO<sub>2</sub> concentration is 1.9 µg/m<sup>3</sup>, a decrease of 0.4 µg/m<sup>3</sup> from 2013 and is still below the NWT AAQS of 60 µg/m<sup>3</sup>



# Annual Ambient Sulphur Dioxide Concentrations



# Annual Ambient Nitrogen Dioxide Concentrations



# Particulate Monitoring

- The Dichot Partisols that measured  $PM_{10}$  and  $PM_{2.5}$  located at the airstrip and explosives emulsion plant were decommissioned in July 2014 and replaced with 5030 SHARP  $PM_{2.5}$  monitors in November 2014. Exceedances of the NWT AAQS were recorded for TSP at the wetland station and for  $PM_{2.5}$  at the airstrip and the explosives emulsion plant stations. Annual TSP and  $PM_{2.5}$  averages measured in 2014 were higher than those measured in 2013, while the annual average for  $PM_{10}$  was lower than that recorded in 2013.



# Emissions

- Fuel consumption was approximately 37,748 cubic metres (m<sup>3</sup>) of diesel with a maximum sulphur content of 15 parts per million by weight. The space heating furnaces predominantly used diesel for fuel, but also used 30 m<sup>3</sup> of waste oil in 2014. Fuel consumption in 2014 is similar to the amount used in 2013, while monthly tonnage of waste burned in 2014 was overall less than the tonnage burned in 2013. Emission rates in 2014 were similar to those reported in 2013 and remained below the emission rates predicted in the 2007 Air Modelling Update



# Incinerator Stack Testing Results

- The Mine currently has two Ketek Model CY-100-CA-D incinerators, which began operation in June and August 2013
- Stack testing of these incinerators occurred on July 11 to 15, 2014
- The sum total of Dioxins and Furans was found to exceed the Canadian-Wide Standards (CWS)
  - The incinerators are still in operation, but training and education of staff will be continued to ensure that only acceptable items are incinerated because burning of unacceptable items such as plastic can contribute to higher emissions of dioxins and furans
- Mercury emissions were below the Canada-Wide Standard



# Comments from the Environmental Analyst

- It is a concern that De Beers failed to meet the Dioxins and Furans CWS



# 8. Water Licence Amendment Application

- No updates in July 2015

