



March & April 2020
Environmental Update
May 14, 2020

Outline

1. Mine Update
2. SNP Reports
3. Inspection Reports
4. Update of the Water Licence and Land Use Permit Review Process for Snap Lake Mine Closure
5. Environmental Agreement Update
6. SLEMA's Activities



Acronyms

- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- ECCC – Environment and Climate Change Canada
- ECM – Extended Care and Maintenance
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- MVEIRB – Mackenzie Valley Environmental Impact Review Board
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SNP – Surveillance Network Program
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond



1. Mine Update

- The Snap Lake Mine is currently on Extended Care and Maintenance (ECM);
- All personnel left the site on September 5th, 2019;
- Remote data collection and monitoring was set up to be carried out during the winter months for the 2019-2020 season;
- Zero occupancy occurred during Feb and March, thus no activities related to waste disposal or water withdrawal was performed;
- 4 site visits were carried out during this period



2. SNP Reports for Feb & March 2020

Monitoring of Snap Lake Mine was carried out and reported for the months of February and March; it included:

- Remote monitoring on a weekly basis of the perimeter sumps, Water Management Pond and Fuel 12M L Tank Farm (by photos)
- Remote monitoring of the East Cell instrumentation and
- Remote monitoring of site specific weather data



2. SNP Reports for Feb & March 2020

Monitoring of Snap Lake Mine for the months of Feb and March included site visits

- Site Inspections of the North Pile, Perimeter Sumps, Water Management Pond Dams 1&2. Response categories are in yellow for all Sumps and the WMP ;
- Site inspections of the 12M Liter, 500,000 Liter, 330,000 Liter, Utility Day, the Far Fuel Tanks and Day Tank Fuel Piping ;
- Aerial Photos of Snap Lake;














2. SNP Reports

Monitoring of Snap Lake Mine in February and March included:





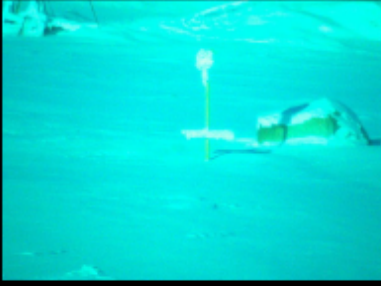



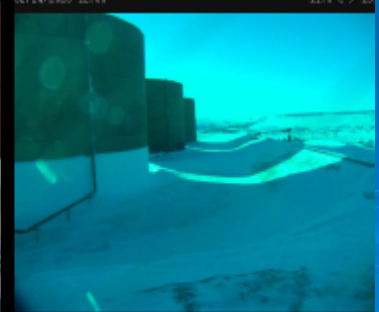
- Wildlife surveillance; no wildlife reported in Feb or March;
- Landfill inspection;
- Site visit conducted on February 9th and 18th;
- Site visit conducted on January 1st and March 24th



Water Control Structure	Photos			
	Week 1 (February 01 - 07)	Week 2 (February 08-14)	Week 3 (February 15-21)	Week 4 (February 22-29)
Perimeter Sump 1	Not Available due to camera malfunction			Not Available due to camera malfunction
Perimeter Sump 2	Not Available due to camera malfunction			
Perimeter Sump 3	Not Available due to camera malfunction			
Perimeter Sump 4	Not Available due to camera malfunction			







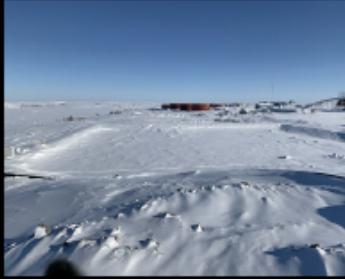




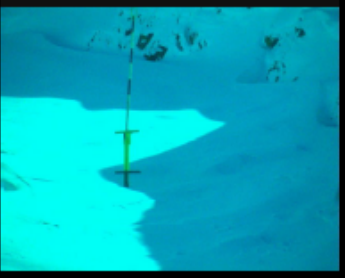
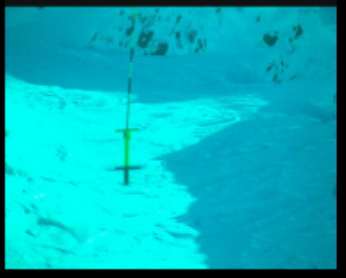

February 2020 Remote Monitoring Site Photos



Water Control Structure	Photos			
	Week 1 (February 01 - 07)	Week 2 (February 08-14)	Week 3 (February 15-21)	Week 4 (February 22-29)
Perimeter Sump 5	Not Available due to camera malfunction			Not Available due to camera malfunction
Water Managemnet Pond				
Fuel Tank	Not Available due to camera malfunction			
PS1, PS2, PS3, PS4, PS5 and Fuel Tanak cameras are malfunctioning. At this time no definitive explanation for failure				



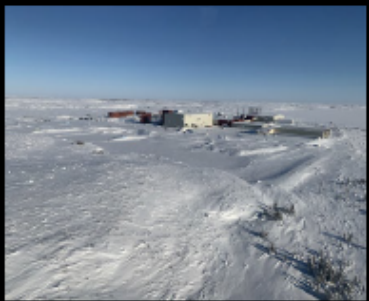




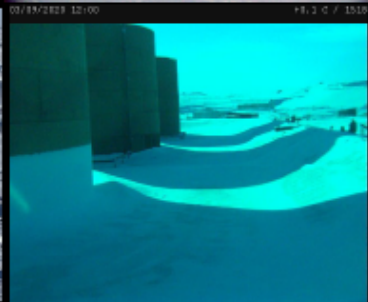


February 2020 Remote Monitoring Site Photos



Water Control Structure	Photos			
	Week 1 (March 01 - 08)	Week 2 (March 09-15)	Week 3 (March 16 -22)	Week 4 (March 23-31)
Perimeter Sump 1		Not Available due to camera malfunction	Not Available due to camera malfunction	
Perimeter Sump 2				
Perimeter Sump 3				
Perimeter Sump 4				

March 2020 Remote Monitoring Site Photos



Water Control Structure	Photos			
	Week 1 (March 01 - 08)	Week 2 (March 09-15)	Week 3 (March 16 -22)	Week 4 (March 23-31)
Perimeter Sump 5		Not Available due to camera malfunction	Not Available due to camera malfunction	
Water Managemnet Pond				
Fuel Tank				
PS1 and PS5 cameras are malfunctioning. At this time no definitive explanation for failure				

March 2020 Remote Monitoring Site Photos



3. GNWT Inspection

No inspection report was received for February and March 2020



4. Snap Lake Mine Closure: Water Licence and Land Use Permit Review Process Update

Main steps of the Water Licence and LUP amendment – Renewal are:

- Public Hearing (PH) held on November 26 & 27 2019;
- Stakeholders (DFO, ECCC, GNWT and SLEMA) reviewed the WL & LUP drafts on Jan 30



4. Update of Regulatory Process for Snap Lake WL Amendment – Renewal and LUP Amendment

Main steps of the Water Licence and LUP amendment – Renewal are (Cont.):

- DeBeers responded to reviewers' comments on Feb 7;
- Closing arguments from interveners (DFO, ECC, GNWT) submitted on Feb 14



4. Update of Regulatory Process

Main steps of the Water Licence and LUP amendment – Renewal are (Cont.):

- Closing Arguments from Proponent (DeBeers) submitted on Feb 21;
- Board Decision on De Beers' Application on March 20;



4. Update of Regulatory Process

Main steps of the Water Licence and LUP amendment – Renewal are (Cont.):

- Water Licence sent to GNWT Minister for review on March 20;
- Final Decision from GNWT Minister on the Water Licence and LUP up to 90 days (current Water Licence expires June 13 2020)



4. Update of Regulatory Process

➤ Board Decision on March 20 2020:

The Board has considered the evidence associated with the proposed EQC for nitrate and

- 1) It has decided to approve De Beers' proposed EQC for closure, and
- 2) It requires the submission of EQC Re-evaluation Report to confirm EQC for Post-Closure.



4. Update of Regulatory Process

- EQC During Active Closure Phase Approved by the Board on March 20

Parameter	Maximum Average Concentration (mg/L)
Nitrate as N	60
Total Suspended Solids	15
Total Petroleum Hydrocarbons	5 (Max Grab Conc.)
Faecal Coliforms	10 CFU/100ml



4. Update of Regulatory Process EQC

- What is Effluent Quality Criteria (EQC)?

EQC represent the maximum concentration of a contaminant in the effluent that will enable the receiving water to meet Water Quality Objectives (WQO)

In this case:

The effluent is the mine effluent (mainly the drainage from North Pile);

The receiving water is the Snap Lake



4. Update of Regulatory Process – EQC

EQC for the Snap Lake Mine Effluent must be set at levels that will ensure that, when Effluent is discharged, water quality objectives for the Snap Lake will be met.

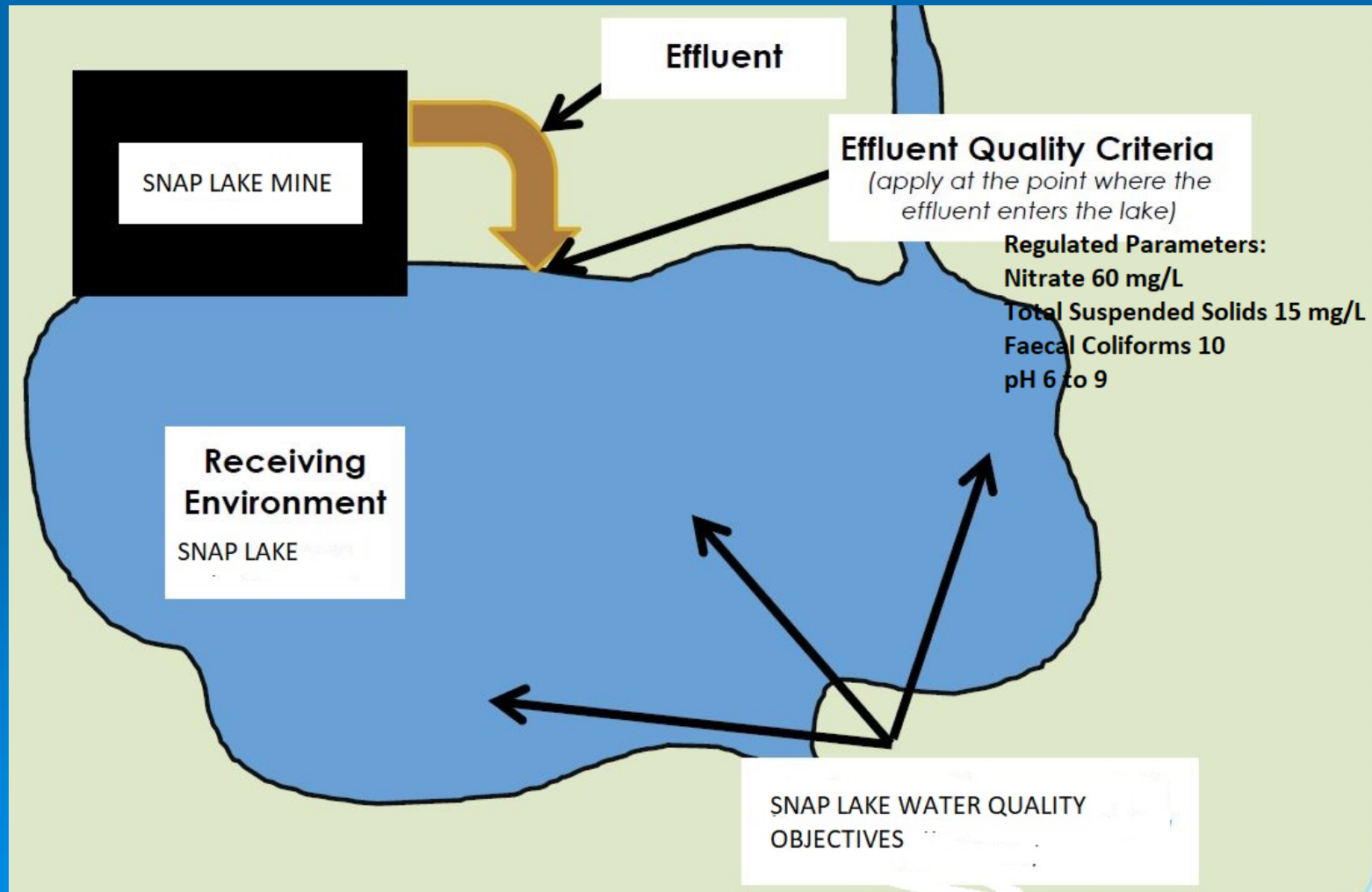
WATER QUALITY OBJECTIVES (WQO) FOR SNAP LAKE: Snap Lake Water Must Be

- Safe to drink and
- Safe for aquatic life
- According to this the Board has considered that WQO for Snap Lake are met by the proposed EQC



4. Update of Regulatory Process

EQC During Active Closure Phase Approved by the Board on March 20



4. Update of Regulatory Process

➤ Other Conditions in the WL as Approved by the Board

- 1) The discharge shall not be acutely toxic to aquatic life;**
- 2) The submission of an Effluent Quality Criteria (EQC) Re-evaluation Report by De Beers;**
- 3) The submission of a Plume Delineation Study by DeBeers;**



4. Update of Regulatory Process – Plume Delineation Study

Why is important to carry out a plume delineation study?

- When the effluent is discharged into Snap Lake, it does not completely and instantaneously mix with the lake water.
- Instead, it forms an “Effluent Plume” starting at the outfall as the Effluent begins to mix with the lake water
- The mixing zone is a transitional area within the Lake in which the Effluent discharge is gradually assimilated into the lake water

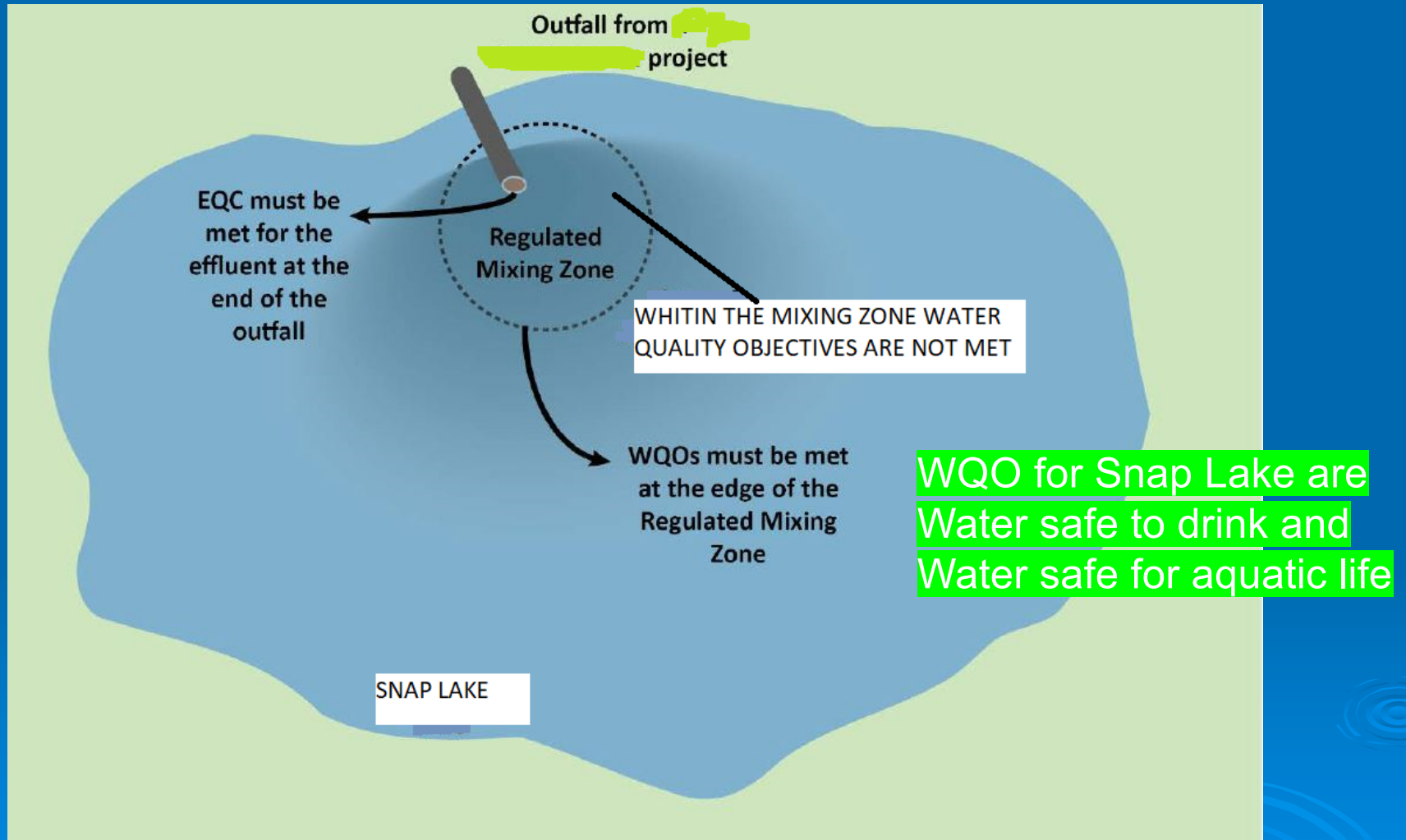


4. Update of Regulatory Process – Plume Delineation Study

- The end of the mixing zone defines the point at which the Lake Water Quality Objectives (WQO) must be met;
- Within the area of the Mixing Zone, lake water cannot meet the WQO but the water lake **MUST** not be toxic to aquatic life;
- To define this area a plume delineation study will be carried out



4. Update of Regulatory Process – Plume Delineation Study



Delimitation of Mixing Zone
WQO: Water Quality Objectives



5. Update of Environmental Agreement

- No updates



6. SLEMA ACTIVITIES UPDATE

- 1) SLEMA Review of the SNP monthly reports
SLEMA reviewed monthly SNP reports submitted by De Beers and found they met regulatory requirements.
- 2) SLEMA Review of De Beers AEMP Response Plan for Plankton

On April 3, 2020, De Beers submitted notification of an exceedance of low action level for Plankton under the AEMP for the Snap Lake mine.
Response Plan



6. SLEMA ACTIVITIES UPDATE

2) SLEMA Review of DeBeers AEMP Response Plan for Plankton (Cont.)

De Beers requested not to submit an AEMP Response Plan.

MVLWB requested comments on the notification of exceedance and De Beers' request not to submit an AEMP

SLEMA recommended DeBeers submit an AEMP Response Plan for the following reasons:



6. SLEMA ACTIVITIES UPDATE

➤ 2) SLEMA Review of De Beers AEMP Response Plan for Plankton (Cont.)

SLEMA request was mainly based on:

- Changes in the Renewal Water Licence that if approved will increase the allowed concentration of nitrate (nutrients) in the effluent discharged;
- Historical data that show that in 2016, 2018 and 2019 there were low action levels triggered related to nutrients enrichment



6. SLEMA ACTIVITIES UPDATE

➤ 2) SLEMA Review of De Beers AEMP Response Plan for Plankton (Cont.)

De Beers replied to SLEMA that plankton metrics are decreasing towards baseline and proposed to continue monitoring and reporting on water quality and plankton on Snap Lake

Based on De Beers' reply, SLEMA agrees that at this time an AEMP Response Plan for Plankton is not required



6. SLEMA ACTIVITIES UPDATE

- 3) SLEMA Review of DeBeers Response Plan for Low Drinking Water Quality Action Level for Manganese

In May 2019 Health Canada released new Guidelines for Canadian Drinking Water Quality for Manganese.

The maximum acceptable concentration (MAC) for total manganese in drinking water is 120 µg/L.

This MAC is based on a possible association between manganese in drinking water and neurological effects in children.



6. SLEMA ACTIVITIES UPDATE

- 3) SLEMA Review of DeBeers Response Plan for Low Drinking Water Quality Action Level for Manganese (Cont.)

DeBeers reported two samples exceeded the new Guideline for Canadian Drinking Water Quality for Manganese in 2019 and submitted a notice to the Board for consideration;

On April 14, SLEMA submitted its review to the Board



6. SLEMA ACTIVITIES UPDATE

- 3) SLEMA Review of DeBeers Response Plan for Low Drinking Water Quality Action Level for Manganese (Cont.)

SLEMA notices that :

- 1) the values reported are well below the WQG for protection of aquatic life
- 2) The exceedance reported with respect to total manganese in drinking water correspond to samples (2) at depth where, due to the occurrence of anoxic conditions in certain circumstances, the release of soluble forms of manganese are enabled



6. SLEMA ACTIVITIES UPDATE

- 3) SLEMA Review of DeBeers Response Plan for Low Drinking Water Quality Action Level for Manganese (Cont.)

Therefore, SLEMA concludes DeBeers submission and the proposed action plan are adequate.



6. SLEMA ACTIVITIES UPDATE

➤ 4) SLEMA Review of De Beers 2019 Annual Report

De Beers submitted its 2019 Annual Water Licence Report on March 30, 2020.

The Report is required under Water Licence MV2011L2-0004, Part B, condition 7 and Schedule 1;

Reviewers were invited to submit comments and recommendations using the Online Review System (ORS) by May12, 2020;



6. SLEMA ACTIVITIES UPDATE

➤ 4) SLEMA Review of DeBeers 2019 Annual Report (Cont.)

SLEMA reviewed the 2019 Annual Report and found it concludes it meets the Water Licence requirements;

Additional comments were provided by SLEMA regarding the SNP nitrate reported values:

SLEMA notices that many of nitrate results are reported as (I), suspect result: hold time exceeded upon receipt at lab;



6. SLEMA ACTIVITIES UPDATE

➤ 4) SLEMA Review of DeBeers 2019 Annual Report (Cont.)

Nitrates are key parameters in the assessment of the quality of the effluent discharge

SLEMA notes when the new licence is approved, they will be even more important.

Therefore, SLEMA recommended to improve the coordination with the laboratory in order to overcome this issue.

