

**In the Matter of: The Environmental Assessment of the Snap Lake
Diamond Mine Amendment Project, EA1314-02**

And in the Matter of: Scope of the Environmental Assessment

Mackenzie Valley Environmental Impact Review Board

REASONS FOR DECISION

March 28, 2014



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BACKGROUND

On December 20, 2013 De Beers Canada Inc. (the developer) made an application to the Mackenzie Valley Land and Water Board (MVLWB) to amend its existing water licence for the Snap Lake Diamond Mine (MV2011L2-0004). The developer requested 17 amendments to existing water licence conditions. On January 22, 2014 this application was referred by the MVLWB to the Review Board for environmental assessment (EA).

The water licence amendment application was referred based on jurisdictional questions, and concerns raised by parties, regarding proposed amendments that exceed a limit for one water quality parameter (total dissolved solids or “TDS”) that the Review Board had included in measures (#5¹ and #10²) approved by the federal Minister in the Snap Lake environmental assessment, completed in 2003. Further information on the December 2013 water licence amendment application and reasons for referral can be found in the MVLWB [Reasons for Decision](#).

EA steps to date

On February 24, 2014 the Review Board issued a draft EA scoping document for comment. On March 14, 2014 comments were received from:

- The Yellowknives Dene First Nation
- Canadian Northern Economic Development Agency on behalf of Aboriginal Affairs and Northern Development Canada and Environment Canada
- Government of the Northwest Territories – Environment and Natural Resources
- MVLWB

On March 21, 2014 the developer provided its comments on the draft EA scoping document and response to reviewer comments.

This document provides the Review Board’s Reasons for Decision for the scope of the EA. Specifically, which water licence amendments, and associated activities, are included in the scope of assessment, and why.

¹ The Production Water Licence for the Snap Lake project shall specify that the whole lake average TDS concentration in Snap Lake not exceed 350 mg/L at any point in the mine life. This shall be achieved through a total annual load which will not exceed the loads used by De Beers to drive its EA predictions in each year of the mine life.

² In order to ensure that the response of the Snap Lake aquatic community remains within the range predicted by De Beers and to prevent significant adverse impacts to the aquatic community of Snap Lake the Board recommends that the Production Water Licence for the SLDP shall specify that the whole lake average TDS concentration in Snap Lake not exceed the 350 mg/L in the EA predictions by De Beers. This can be achieved by an annual loading limit for TDS which is not to exceed the annual load used by De Beers to conduct its impact assessment.



FRAMEWORK FOR THE REVIEW BOARD ANALYSIS:

In making its decision, the Review Board considered all comments from reviewers and the developer. In addition, the Review Board applied the following questions to each proposed amendment and its associated activities:

1. Would the proposed change result in an effect to the environment or is it purely a regulatory or administrative change?
2. If the developer's proposed change results in an effect to the environment will the proposed change result in an impact that was not assessed previously?

STATUTORY REQUIREMENTS:

The *Mackenzie Valley Resource Management Act (MVRMA)*, sections 114 and 115, require the Review Board to consider the biophysical, socio-economic and cultural impacts that result from activities associated with the amendments included in the scope of the EA.

Under subsection 117 of the *MVRMA* the following must also be considered when assessing the amendments, and their associated activities:

- cumulative impacts
- accidents and malfunctions
- alternate means of carrying out activities



REASONS FOR DECISION

1. Water licence amendments, and associated activities, included in the scope of this EA

The proposed amendments, and associated activities, included in the scope of this EA are the following:

1. Total Dissolved Solids³ (TDS) in Snap Lake
2. Constituents of TDS including, but not limited to, the following:
 - chloride,
 - fluoride,
 - nitrate,
 - nitrite and,
 - sulphate.

1.1. Total Dissolved Solids

The first Snap Lake EA contained two measures regarding Total Dissolved Solids (TDS) limits in Snap Lake. These were measures #5 and #10. These required the whole lake average concentration of TDS in Snap Lake to remain below 350 mg/L. The developer proposes to raise the limit for TDS concentration above this limit. The following outlines the existing water licence condition and the proposed amendment to the condition:

Existing Condition in the 2012 Water Licence Part F, Item 13

- The calculated whole lake average of TDS, (as described in the Surveillance Network Program) at sampling locations comprising Surveillance Network Program Station Number 02-18 shall remain below 350 mg/L at all times.

Proposed Altered Condition for the 2013 Amended Water Licence Part F, Item 13

- Whole-lake average TDS Water Licence limit of 350 milligrams per litre (mg/L) be removed, and an Average Monthly Limit (AML) of 684 mg/L and an Maximum Daily Limit (MDL) of 1,003 mg/L for TDS be added to the Water Licence and applied at end-of-pipe: average TDS concentrations from samples collected over a 30-day period in treated effluent should remain below 684 mg/L (the AML) and the maximum concentration in any grab sample should remain below 1,003 mg/L (the MDL).

³ The total amount of dissolved substances, such as salts or minerals, in water remaining after evaporating the water and weighting the residue



Rationale for inclusion in the scope of the environmental assessment

These measures specific to TDS were approved by the federal Minister and as a result it is mandatory that they be included in the Snap Lake water licence because of section 62 of the *MVRMA*. Consequently, the MVLWB ruled that it cannot amend the water licence to allow TDS to exceed the limit approved by the Minister. Hence, any alteration to these measures must undergo an EA and are therefore included in the scope of this assessment.

1.2. Other proposed changes to EQC's

The developer proposes to amend a table found in the existing water licence that contains 16 parameters of potential concern (POPC) with associated effluent quality criteria. The developer proposes to change the EQCs for five POPC:

- nitrite,
- nitrate,
- chloride,
- fluoride and,
- sulphate.

Rationale for inclusion in the scope of the environmental assessment

The proposed changes to these five EQC are included because they could result in an impact to the environment that was not previously assessed. Further, these POPC contribute to TDS. Based on these reasons these five POPC are included in the scope of this EA.

2. Water licence amendments excluded from the scope of this EA

The following amendments are excluded from the scope of the assessment because they are purely regulatory or administrative changes that will not have a direct impact to the environment. Further, the Review Board considered comments from the developer and reviewers who concur that these amendments should not be included in the scope of the EA.

2.1. Part A Definitions - Change the definition of 'modification'

- Original Definition of Modification: In respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.
- Proposed Revised Definition of Modification: In respect of a structure previously approved by the Board means a change that does not alter the purpose or function of that structure.
- Reason provided by the developer: To remove ambiguity in the definition.



2.2. Part D: Conditions Applying to Construction

- Proposed Addition for 2013 Amendment: Changes to the construction of engineered structures can be made on approval of the Inspector and notice to the Board.
- Reason provided by the developer: removed in 2011 water license to “align with other projects”; however, small scale changes should be able to be approved by the Inspector to avoid unnecessary operational constraints and without wasting the Board’s time and resources.

2.3. Part E, Item 3 - Conditions applying to Waste Management, designation of engineer and geoprofessional

- Original Condition in 2012 Licence in Part E, Item 3: The Licensee shall ensure that all structures designed to contain, withhold, retain, or divert Water or Waste are inspected annually during the summer months by a Professional Engineer, in accordance with the approved relevant Final Detailed Designs, as built reports, and management and monitoring plans. The results of the annual inspection shall be reported as follows:
 - a) The *Engineer's Field Inspection Report* shall be submitted to the Board within 60 (sixty) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's recommendations; and
 - b) The Engineer’s full *Geochemical and Geotechnical Inspection Report* shall satisfy the requirements of Schedule 4, Item 1 and be submitted to the Board by March 31 of the year following the inspection.
- Proposed Altered Condition for 2013 Amendment: The Licensee shall ensure that all structures designed to contain, withhold, retain, or divert Water or Waste are inspected annually during the summer months by a Professional Engineer, in accordance with the approved relevant Final Detailed Designs, as-built reports, and management and monitoring plans. The results of the annual inspection shall be reported as follows:
 - a) The *Engineer's Field Inspection Report* shall be submitted to the Board within 60 (sixty) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's recommendations; and
 - b) The combined Engineer’s and Geoprofessional’s full *Geochemical and Geotechnical Inspection Report* shall satisfy the requirements of Schedule 4, Item 1 and be submitted to the Board by March 31 of the year following the inspection.
- Reason provided by the developer: Clarity and correctness: the Engineer is responsible for the Geotechnical Inspection Report but not for the Geochemical Inspection Report. The Geoprofessional is responsible for the Geochemical Inspection Report.

2.4. Part E, Item 10 - Risk Assessment of North Pile, remove from WL

- Original Condition in 2012 Licence Part E, Item 10: The Licensee shall perform a risk assessment of the North Pile Facility to evaluate the adequacy of current operational procedures and monitoring efforts to ensure that impacts to the Receiving Environment are prevented or minimized. Results of the risk assessment shall be submitted to the Board by September 15, 2012 accompanied by



recommendations for changes to the management of the North Pile Facility and a schedule of implementation.

- Proposed: Remove Condition
- Reason provided by the developer: The requirement has been satisfied.

2.5. Part E, Item 13 a) - Field inspection report, implementation of recommendations

- Original Condition in 2012 Licence Part E, Item 13 a): The *Engineer's Field Inspection Report* shall be submitted to the Board within 60 (sixty) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's recommendations.
- Proposed Altered Condition for 2013 Amendment: The *Engineer's Field Inspection Report* shall be submitted to the Board within 60 (sixty) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's priority recommendations .
- Reason provided by the developer: Differentiates between necessity items and suggestions.

2.6. Part F, Item 8 - Conditions applying to Water and Wastewater management

- Original Condition in 2012 Licence Part F, Item 8: Effluent from the Sewage Treatment Plant shall be tested prior to mixing with the effluent from the Water Treatment Plant at Surveillance Network Program Station Number 02-16i and will meet the following effluent quality requirements.
- Proposed Altered Condition for 2013 Amendment: Effluent from the Sewage Treatment Plant shall be tested prior to mixing with the effluent from the Water Treatment Plant at Surveillance Network Program Station Number 02-16j and will meet the following effluent quality requirements.
- Reason provided by the developer: Station 02-16 renamed to reflect relocation of the Sewage Treatment Plant. All grab sample and monthly average limits remain unchanged from the 2012 license.

2.7. Part F, Item 15 - Strontium response plan – remove from licence

- Original Condition in 2012 Licence Part F, Item 15: The Licensee shall submit for approval by December 31, 2013 a Strontium Response Plan that satisfies the requirements of Schedule 5, Item 2.
- Proposed: remove condition
- Reason provided by the developer: The requirement has been satisfied.

2.8. Part F, Item 16 - Removal of requirement for TDS response plan from WL

- Original condition in 2012 Licence Part F, Item 16: The Licensee shall submit for approval by December 31, 2013 a TDS Response Plan that satisfies the requirements of Schedule 5, Item 3.
- Proposed: remove condition
- Reason provided by the developer: The requirement has been satisfied.

**2.9. Part F, Item 17 - Removal of nitrogen response plan from WL**

- Original condition in 2012 Licence Part F, Item 17: The Licensee shall submit for approval by December 31, 2013 a Nitrogen Response Plan that satisfies the requirements of Schedule 5, Item 4.
- Proposed: remove condition
- Reason provided by the developer: The requirement has been satisfied.

2.10. Part F, Item 19 - Remove requirement to implement plans that are already implemented

- Original condition in 2012 Licence Part F, Item 19: The Licensee shall implement the plans referred to in Part F, Items 15, 16, and 17 as and when approved by the Board.
- Proposed Revised Condition for 2013 Amendment Part F, Item 19: The Licensee shall implement the plans referred to in the approved Nitrogen and TDS Response Plans as approved by the Board.
- Reason provided by the developer: To reflect changes to Part F, Items 15, 16 and 17.

2.11. Part G - Combine AEMP and Re-evaluation plans into one

- Suggested change in Part G to combine the AEMP Design Plan and re-evaluation into one document.

2.12. Schedule 1, Part B, s) - Update Water Management Plan every three years

- Original condition in 2012 Licence Schedule 1, Part B, s) A summary of all work carried out under the approved *Water Management Plan* (required as per Part F, Item 5) during the previous calendar year including iv.: results from the hydrogeological modeling of the quantity and sources of TDS in minewater. The model results shall be compared to previous predictions of minewater discharge, and any changes in input parameters or assumptions shall be clearly described.
- Proposed Revised Condition for 2013 Amendment Schedule 1, Part B s): A summary of all work carried out under the approved *Water Management Plan* (required as per Part F, Item 5) during the previous calendar year including iv.: results from the hydrogeological modeling of the quantity and sources of TDS in minewater shall be completed every 3 years. Between the three years, De Beers will compare actual data to predictions, if there was divergence with data above predictions that would trigger further investigation. However, if data were at or below predictions, further investigation would not be necessary within the 3 years.
- Reason provided by the developer: Modeling is used to support long-range planning and models. The models are calibrated with field monitoring results used to determine compliance and trends in the results are used to guide year-to-year tactical planning. As such, a frequency of three years is appropriate for updating the models.

2.13. Proposed SNP Revisions

Proposed SNP Revisions

02-02: North Pile Drainage collection ditch:

- Remove requirement for flow temperature, pH, conductivity and turbidity monitoring as flows are not continuous.



- Revise to monitoring when flows are observed.

02-03: Core Facilities Area Collection Ditch near the Water Management Pond

- Remove requirement for flow temperature, pH, conductivity and turbidity monitoring as flows are not continuous.
- Revise to monitoring when flows are observed.

02-17: Temporary WTP (Auxiliary)

- Change station to inactive as all flow is discharged into the pH adjustment tank and measured at SNP Station 02-17B.

Stations 02-02, 02-03, 02-04, 02-05, 02-06, 02-07, 02-08, 02-09, 02-10, 02-11, 02-12, 02-13, 02-14

- Since monitoring commenced in 2004 there have been no hits of BTEX, F1-F2 at any of the SNP stations.

2.14. Part F, Item 9 a) – remove requirement to monitor for

- The developer proposed to remove the requirement to monitor for eight parameters of potential concern found in Part F, item 9a: arsenic, chromium, copper, lead, nickel, zinc, and F1 and F2 fractions.

3. Not in the scope of EA because change has minimal environmental impact

The following amendments are not included in the scope of the EA because the amendments are a result of natural variability found during ongoing monitoring.

3.1. Part F, Item 9b - PH in bogs

- Original condition in 2012 Licence Part F, Item 9b: Any Water or Waste from the Project that enters the Receiving Environment shall have a pH between 6.0 and 9.0, except surface runoff which shall have a pH between 5.0 and 9.0.
- Proposed Amended Condition for 2013 Amendment Part F, Item 9b: Any Water or Waste from the Project that enters the Receiving Environment except for bog and seepage sites shall have a pH between 6.0 and 9.0, except surface runoff which shall have a pH between 5.0 and 9.0.
- Reason provided by the developer: Changed to reflect baseline bog and seepage values as reported in the acid rock drainage annual report which have reported values below 4.0 at 02-07 and 02-09.



3.2. Part F, item 12 - water quality and disposal of land locked areas

- Original condition in 2012 Licence Part F, Item 12: The Licensee shall direct all Water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9 to the Water Treatment Plant or Water Management Pond. The Inspector may authorize the divergence of Water to an alternate location if necessary. The Licensee shall notify the Board in writing within twenty-four (24) hours of this authorization being granted.
- Proposed Altered Condition for 2013 Amendment Part F, Item 12: The Licensee shall direct all Water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9 to the Water Treatment Plant or Water Management Pond. This does not include stations that are considered land locked and do not present a threat to the receiving environment. The Inspector may authorize the divergence of Water to an alternate location if necessary. The Licensee shall notify the Board in writing within twenty-four (24) hours of this authorization being granted.
- Reason provided by the developer: To prevent regulatory (i.e., of no environmental concern) non-compliance for TSS, copper, aluminum, and zinc due to regional variability at stations SNP stations 02-04.1, 02-04.2, 02-05, 02-06, 02-07.1, 02-07.2, 02-07.3, 02-07.4, 02-07.5, 02-07.6, 02-09, 02-09.2, 02-09.3, 02-09.4, 02-09.5, Water Management Pond.

CONCLUSION:

For the reasons set out, the components of the proposed amendments that will be further assessed by the Review Board include only TDS and all its constituents including, but not limited to: nitrite, nitrate, chloride, fluoride, and sulphate.

The Review Board has reviewed the developer's water licence amendment application and decided that it provides sufficient information to commence an assessment on those amendment requests which the Review Board has decided are within the scope of this EA. Because sufficient information is provided the Review Board will not issue a Terms of Reference and hence, no Developer's Assessment Report is required. Should parties to the assessment determine that further information is required the Information Request stages will suffice to gather this information.

In addition to the current EA process, the public will also have the opportunity to participate in the MVLWB water licence process, including a public hearing, which will address all the proposed amendments listed above including any that may be outside the scope of this EA.

NEXT STEPS:

The Review Board will require the developer to file information needed to satisfy ss.114, 115, and 117 of the *Mackenzie Valley Resource Management Act*. These sections require that the developer describe the



biophysical, socio-economic and cultural impacts that result from activities associated with the amendments that are within the scope of this assessment. Further, the developer must describe the cumulative impacts; accidents and malfunctions; and alternate means of carrying out these activities.