



## Staff Report

<b>Applicant:</b> De Beers Canada Inc.	
<b>Location:</b> Kennady Lake, NT	<b>Application:</b> MV2005L2-0015
<b>Date Prepared:</b> April 13, 2016	<b>Meeting Date:</b> April 18, 2016
<b>Subject:</b> Revision to Annex A: Surveillance Network Program	

### 1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a request from De Beers Canada Inc. (De Beers) to revise the Surveillance Network Program (SNP) annexed to Water Licence (Licence) MV2005L2-0015 for decision.

### 2. Background

- September 24, 2014 – Board issues Licence MV2005L2-0015;
- March 9, 2016 – De Beers submits a request to revise the SNP annexed to the Licence;
- April 5, 2016 – Review comments and recommendations due;
- April 12, 2016 – Responses due; and
- **April 18, 2016 – Request presented to the Board.**

### 3. Discussion

In preparing for the transition from the construction phase to the operations phase of mine development, De Beers noted a number of concerns with several of the SNP stations. As such, on March 9, 2016, they submitted a request to the Board to revise the SNP (attached). The request included revisions to monitoring stations for the open pit sumps, and seepage monitoring stations for the waste rock piles and processed kimberlite storage facilities.

With regard to the open pit sump stations, De Beers explained that continuous monitoring of physical parameters is not practical and should be removed from the requirements, since inconsistent flow from the sumps damages the sensors. Discrete samples would still be collected weekly and monthly for these parameters as required by the Licence. De Beers also requested that

the sampling frequency for flow and volume be changed to continuously 'when pumping'.

With regard to the seepage monitoring stations, De Beers noted that flow and volume are to be recorded continuously as described in the footnotes to Part B of the SNP. Since seepage is likely to be discontinuous at these stations, De Beers explained that it could not continuously monitor flow and volume at these stations and requested that the volume requirement be removed. De Beers proposed to make note of the presence or absence of flow at each station during the surveys.

#### **4. Comments**

Part B, item 7 of Licence MV2005L2-0015 allows the Board to change the Schedules, SNP or any compliance dates specified in the Licence at its discretion.

#### **5. Reviewer Comments**

By April 5, 2016, comments and recommendations on the request to revise the SNP were received from two reviewers:

- Environment and Climate Change Canada, and
- Government of the Northwest Territories – Department of Environment and Natural Resources.<sup>1</sup>

The Inspector submitted a comment after the due date.

De Beers responded on April 12, 2016. The reviewer comment summary table (attached) presents the concerns identified through the review of the request to revise the SNP.

#### **6. Security**

The GNWT currently holds \$7,226,931.00 in reclamation security for the Gahcho Kué mine for this Licence.

#### **7. Conclusion**

Board staff concludes that the revisions proposed by De Beers are reasonable if considered in conjunction with De Beers' responses to review comments. It is not necessary, however, to alter the frequency of water quality sampling for the open-pit sumps, since this is already set out in the status for these stations, which are only considered to be active when water or waste is pumped from these stations to the surface.

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<sup>1</sup> GNWT-ENR initially submitted a no-comment letter, which was then followed by specific comments and recommendations. This was acknowledged by GNWT-ENR in the Reviewer Comment Summary Table: GNWT-ENR (Paul Green), Comment ID3.

## 8. Recommendation

Board staff recommends that the Board approve the following revisions to the SNP:


- Sampling frequency for physical parameters at SNP stations 08, 09, and 10 revised to Daily (when sump is active);
- Footnote for flow and volume measurements revised to allow for discrete measurements of flow at SNP stations 11 through 14 if seepage is discontinuous at these stations; and
- Footnote for flow and volume measurements revised to require that flow measurement methods are recorded for SNP stations 11 through 14.

Board staff recommends that the flow and volume monitoring methods for the seepage stations (as proposed by De Beers in its response to review comments) be reviewed if continuous seepage is noted at any of these stations.

## 9. Attachments

- [Reasons for Decision – August 11, 2014](#)
- [Request to revise SNP – March 9, 2016](#)
- Review Comment Summary Table
- Draft Conditions
- Draft Reasons for Decision
- Draft Decision Letter from the Board

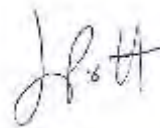
Respectfully submitted,



Angela Love  
Regulatory Officer



Lindsey Cymbalisky  
Technical Advisor



Jen Potten  
A/Regulatory and Officer Manager

Reviewed by,



Rebecca Chouinard  
Regulatory and Technical Director

## Review Comment Table

<b>Board:</b>	MVLWB
<b>Review Item:</b>	De Beers Gahcho Kue - Request to Revise SNP - MV2005L2-0015
<b>File(s):</b>	<a href="#">MV2005L2-0015</a>
<b>Proponent:</b>	De Beers Canada Inc - Gahcho Kue
<b>Document(s):</b>	<a href="#">Request to Revise SNP</a> (127 KB)
<b>Item For Review Distributed On:</b>	Mar 14 at 15:56 <a href="#">Distribution List</a> Mar 14 at 15:56 <a href="#">Distribution List</a>
<b>Reviewer Comments Due By:</b>	Apr 5, 2016
<b>Proponent Responses Due By:</b>	Apr 12, 2016
<b>Item Description:</b>	<p>De Beers Gahcho Kue has submitted a request to revise the Surveillance Network Program (SNP) for Water Licence MV2005L2-0015.</p> <p>Part B, item 7 of Licence MV2005L2-0015 allows the Board to amend the Schedules, SNP or any compliance dates specified in the Licence at their discretion.</p> <p>Please submit comments using the Online Review System by downloading the excel comment table or using the "add comment" button.</p> <p>If you have any questions or comments regarding this Plan or using the Online Review System, please contact Angela Love at 867-766-7456 or <a href="mailto:angela.love@mvlwb.com">angela.love@mvlwb.com</a>.</p>
<b>General Reviewer Information:</b>	<p>Fort Resolution Métis Council Trudy King fax: (867)394-3322; <a href="mailto:Fieldworker.frmc53@northwestel.net">Fieldworker.frmc53@northwestel.net</a></p> <p>Hay River Metis Council Karen Lafferty President fax: (867)874-4472; <a href="mailto:hrcm@northwestel.net">hrcm@northwestel.net</a></p> <p>NWT Metis Nation Tim Heron NWTMN IMA Coordinator fax: (867)872-3586; <a href="mailto:rcc.nwtmn@northwestel.net">rcc.nwtmn@northwestel.net</a></p>
<b>Contact Information:</b>	<p>Angela Love 867-766-7456 Jen Potten 867-766-7468</p>

## Comment Summary

Environment and Climate Change Canada: Melissa Pinto				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
1	General File	<b>Comment</b> ( <a href="#">doc</a> ) ECCC Cover Letter <b>Recommendation</b>		
2	Seepage Monitoring	<p><b>Comment</b> De Beers Canada Inc. (the Proponent) has proposed changes to SNP-11 through SNP-14, which include confirming seepage presence during surveys and removing the volume requirement, due to concerns with measuring flow and volume continuously. It is noted that the wording around flow and volume needs to be revised, however there are requirements in the water licence (MV2005L2-0015) for estimates of seepage volume. As such, there must be a protocol specified for the estimation of seepage quantities. See below for references to the water licence in regards to seepage volume: - Schedule 5, Part G: Water and Waste Management, Item 7f (Geochemical Characterization and Management Plan) '<i>...with respect to geochemical stability as well as <b>Seepage and runoff quality and quantity</b></i>' - Schedule 5, Part G: Water and Waste Management, Item 9a (Processed Kimberlite and Waste Rock Management Plan) 'A summary of proposed contingency measures for <b>controlling runoff and Seepage Water volume, routing, and quality</b>' - Schedule 5, Part G:</p>	<p><b>Apr 12:</b> De Beers propose the following procedure to estimate flow and volume of seepage:</p> <ul style="list-style-type: none"> <li>• If flow is apparent at any seepage survey station established along the toe of a mine rock pile and/or in a drainage channel draining from the mine rock piles, flow will be estimated using the most appropriate method from those listed below:               <ul style="list-style-type: none"> <li>o Measure flow velocity through a measured cross-section of the channel (most ideal method).</li> <li>o Under low flows in irregular or poorly defined channels, identify a location where the flow is best defined. Measure the width and typical depth of the flow. Estimate the flow by taking three measurements of the time taken to travel a fixed distance by floating object (such as a twig/stick).</li> </ul> </li> </ul>	<p>Acceptable response. Estimates of seepage quantity from these facilities are required as noted by ECCC; however, seepage from these facilities will likely be discontinuous. Flow and volume at these stations should be estimated based on flow measurements conducted when water samples are collected. If on-going seepage from these facilities is noted, this approach must be reviewed.</p>

	Water and Waste Management, Item 9b (Processed Kimberlite and Waste Rock Management Plan) ' <i>Details and rationale for monitoring and inspection, including geotechnical stability, thermal characterization, <b>Seepage quality and quantity, and run-off for all components</b></i> ' <b>Recommendation</b> The Proponent should provide an alternative method for determining estimates of seepage quantities to allow for implementation of mitigation measures for the protection of adjacent surface waters if necessary.	<ul style="list-style-type: none"> <li>o Under low flows in irregular or poorly defined channels, identify a location where the flow is best defined. Using a measuring stick as a benchmark, remove a known volume and time the recharge rate of the seep to the originally marked water level.</li> <li>o If the flow can be directed into a container of known volume (i.e.. 1 L plastic beaker), record the time it takes to collect a volume of water in the beaker (without the water spilling out) using a stopwatch. Repeat two more times.</li> </ul> <ul style="list-style-type: none"> <li>• Record method used to obtain flow.</li> </ul>	
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**GNWT - ENR: Central Email GNWT**

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
1	General File	<b>Comment</b> ( <a href="#">doc</a> ) ENR Letter - No Comments or Recommendations at this time. <b>Recommendation</b>		

**GNWT - ENR: Paul Green**

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
2	Requested changes to stations SNP 08 to 10	<b>Comment</b> The August 11, 2014 Reasons for Decision for MV2005L2-0015 identify that the sampling frequency and	<b>Apr 12:</b> The objective of monitoring at SNP01-08 through SNP01-10 is to monitor the chemistry of	Acceptable response.

	<p>parameters for SNP Stations 08 to 10 are based upon recommendations submitted by DeBeers as part of their water licencing application. Water Licence MV2005L2-0015 currently specifies continuous monitoring of physical parameters, flow and volume at these locations which are identified as being active when water or waste is pumped from the sump to the surface. Physical parameters are identified as: dissolved oxygen, pH, specific conductivity, temperature, total suspended solids and turbidity. Flow and volume are to be measured and recorded continuously during periods of flow or pumping. DeBeers is requesting that the requirement to monitor physical parameters be removed from the licence due to infrastructure limitations and that the frequency be changed to “continuously when pumping” in order to prevent damage to sensory equipment due to inconsistent flow. Of the physical parameters listed, TSS is the only parameter that WRD is aware of that could not be measured continuously in-line using sensor or probe technology. DeBeers has not provided information on what infrastructure limitations are preventing the collection of the other parameters. WRD accepts that TSS could be removed from the list of physical parameters collected on a continuous basis, but is of the opinion that the requirement to monitor the remaining parameters should be</p>	<p>inflows to the pits during mining (the inflows will represent a large proportion of groundwater, as well as surface water and seepages). For clarity, pit dewatering from the sumps associated with SNP 8, 9, and 10 stations will be intermittent and pumping duration is expected to be on a scale of days as opposed to continuously pumping water for weeks. As a consequence, De Beers is concerned about infrastructure limitations and potential damage to delicate sensory equipment associated with the physico-chemical monitoring because of the discontinuous nature of the pit dewatering schedule. Intermittent pumping would mean that the sensors in the monitoring equipment (e.g., DO membranes, pH probes, and turbidity probes) that would be installed within the pipeline itself (consistent with the pumping infrastructure associated with SNP01-02 and SNP01-04) would be highly susceptible to drying out during the open water period, and freezing during winter months, thereby causing damage. De Beers'</p>	
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		<p>retained. ENR understands that De Beers is using turbidity as a surrogate for TSS for triggering action levels, and has developed a turbidity-TSS correlation curve. ENR notes that the accuracy of this curve will improve as more data becomes available, and therefore it will be beneficial to all parties to ensure that sufficient TSS samples are analyzed in order to provide a robust turbidity-TSS relationship. As it is currently written in the licence, WRD believes the flow and volume monitoring at these stations is to be collected only during periods of flow or pumping. However, WRD is not opposed to adding this clarification to the SNP table. <b>Recommendation</b> WRD recommends that the requirement for continuous in-line monitoring of physical parameters (except TSS) be retained. WRD recommends that the Board could add additional clarification regarding when data is to be collected from these SNP stations.</p>	<p>request is to modify the requirement under the SNP to monitor pit water "continuously (by in-line monitoring)" as the infrastructure that would be used to fulfill the requirement of continuous in-line monitoring would likely become damaged due to prolonged exposure. De Beers recommends the wording be revised to "daily while pumping is active", thus allowing the monitoring of these stations while pumping using handheld devices, such as YSI's or Hydrolabs. De Beers is not requesting any changes to the requirements related to continuous monitoring of flow for SNP's 01-08, 01-09 and 01-10; flow meters are designed to withstand the conditions imposed by intermittent pumping.</p>	
3	Requested changes to SNP 11 to 14	<p><b>Comment</b> The August 11, 2014 Reasons for Decision for MV2005L2-0015 identify that the sampling frequency and parameters for Stations 11 to 14 are based upon recommendations submitted by DeBeers as part of their water licencing application. These stations are to be monitored twice per year for flow, volume, physical parameters, major ions, nutrients and total and dissolved</p>	<p><b>Apr 12:</b> The objective of monitoring at SNP01-11 through SNP01-14 is to identify signs of incipient acid generation and metal leaching in seepage from waste management areas. As identified by WRD, seepage flow data can be used in concert with water quality monitoring data to compare water</p>	<p>Acceptable response. Estimates of seepage quantity from these facilities are required as noted by ENR; however, seepage from these facilities will likely be discontinuous. Flow and volume</p>



		<p>metals as well as following major storm events for a reduced sample set. Flow is to be measured continuously during periods of flow or pumping. DeBeers is requesting to remove the requirement to measure flow and volume, and replace it with a presence/absence assessment of flow during the seepage survey. WRD accepts that “continuous” monitoring of seepage may not be feasible, but notes that flow and volume estimates will be required in the event it becomes necessary to estimate contaminant loadings from the rock piles and PKC facilities. WRD further notes that, while not part of their SNP, Ekati collects data on seepage flow from their rockpiles as part of their annual seepage monitoring study.</p> <p><b>Recommendation</b> WRD recommends that the requirement to measure flow be modified from “continuous” to an instantaneous estimate of flow and volume made at the same time water quality samples are collected.</p>	<p>quality trends from the waste management areas to the predicted trends in the water quality predictions. De Beers agrees with this recommendation that physico-chemical (i.e., pH, specific conductivity, DO, temperature) monitoring be conducted when seepages are evident. Seeps from waste rock dumps tend to be low volume, temporal, and linked to seasonal events (e.g., spring freshet, heavy rainfall events). It is not appropriate to install in-line monitoring for temporal seeps, because of infrastructure limitations and potential damage to delicate sensory equipment caused by discontinuous nature of seepages; in these instances, physico-chemical monitoring can be conducted when collecting a grab sample. Where seeps show signs of permanence, the significance will be assessed and appropriate actions taken. De Beers propose the following procedure to provide a coarse estimate of flow and volume of seepage:</p> <ul style="list-style-type: none"> <li>• If flow is apparent at any seepage survey stations established along the</li> </ul>	<p>at these stations should be estimated based on flow measurements conducted when water samples are collected. If on-going seepage from these facilities is noted, this approach must be reviewed.</p>
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			<p>toes of the mine rock pile and/or in a drainage channel draining from the mine rock piles, flow will be estimated using the most appropriate method from those listed below:</p> <ul style="list-style-type: none"><li>o Measure flow velocity through a measured cross-section of the channel (most ideal method).</li><li>o Under low flows in irregular or poorly defined channels, identify a location where the flow is best defined. Measure the width and typical depth of the flow. Estimate the flow by taking three measurements of the time taken to travel a fixed distance by floating object (such as a twig/stick).</li><li>o Under low flows in irregular or poorly defined channels, identify a location where the flow is best defined. Using a measuring stick as a benchmark, remove a known volume and time the recharge rate of the seep to the originally marked water level.</li><li>o If the flow can be directed into a container of known volume (i.e.. 1 L plastic beaker), record the time it takes to collect a volume of water in the beaker (without the water spilling out) using a</li></ul>	
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			stopwatch. Repeat two more times. · Estimate proportion of flow being captured. · Record method used to obtain flow. The results of monitoring from the SNP monitoring stations will also be compared to the analytical results of samples collected from seeps identified during the bi-annual geochemical audit.	
3	Water Resource Comments	<p><b>Comment</b> The GNWT Central E-mail has submitted a letter indicating there are no comments from the other Divisions of ENR, however Water Resources Division has provided two comments on De Beers' request to revise their SNP.</p> <p><b>Recommendation</b> No specific recommendation.</p>		Noted.



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Environmental Protection Operations Directorate  
Prairie & Northern Region  
5019 52<sup>nd</sup> Street, 4<sup>th</sup> Floor  
P.O. Box 2310  
Yellowknife, NT X1A 2P7

April 1, 2016

ECCC File: 5100 000 013/007  
MVLWB File: MV2005L2-0015

Angela Love  
Regulatory Officer  
Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor, 4922 48<sup>th</sup> Street  
P.O. Box 2130  
Yellowknife, NT X1A 2P6

Via online submission

**RE: MV2005L2-0015 – De Beers Canada Inc. – Gahcho Kue Mine – Request to Revise the Surveillance Network Program**

Attention: Angela Love

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board regarding the above-mentioned request. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4733 or [Melissa.Pinto@canada.ca](mailto:Melissa.Pinto@canada.ca).

Sincerely,

Melissa Pinto  
Environmental Assessment Coordinator

Attachment(s): ECCC Comments Excel Sheet

cc: Wade Romanko, Head, Environmental Assessment North (NT and NU)  
ECCC Review Team

April 5, 2016

Angela Love  
Regulatory Officer  
Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor – 4910 50<sup>th</sup> Avenue  
P.O. Box 2130  
Yellowknife, NT  
X1A 2P6

Dear Ms. Love,

**Re: DeBeers Canada Inc. – Gahcho Kue Mine  
Water Licence – MV2005L2-0015  
Request to Revise SNP  
Request for Comments**

The Department of Environment and Natural Resources has reviewed the request at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, *Waters Act* and the *Wildlife Act* and has no comments or recommendations for the consideration of the Board at this time.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email [patrick\\_clancy@gov.nt.ca](mailto:patrick_clancy@gov.nt.ca).

Sincerely,



Patrick Clancy  
Environmental Regulatory Analyst  
Environmental Assessment and Monitoring  
Land and Water Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories