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Staff Report

Applicant: De Beers Canada Inc.	
Location: Kennady Lake, NT	File Number: MV2005C0032 and MV2005L2-0015
Date Prepared: July 25, 2019	Date of Board Meeting: August 29, 2019
Subject: 2018 Annual Report – Information Update for the Gahcho Kue Mine	

1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) an update on the De Beers Canada Inc. (De Beers) operation for the Gahcho Kue project, as per the Annual Reporting requirements in Water Licence (Licence) MV2005L2-0015 and Land Use Permit (Permit) MV2005C0032.

2. Background

- August 11, 2014 – Board issues Permit MV2005C0032 to De Beers and submits recommendation for approval of Licence MV2005L2-0015 to the Minister of Environment and Natural Resources;
- September 23, 2014 – Minister of Environment and Natural Resources approves Licence MV2005L2-0015;
- September 24, 2014 – Board issues Licence MV2005L2-0015 to De Beers;
- March 30, 2019 – De Beers submits the 2018 Annual Report covering Licence MV2005L2-0015 and Permit MV2005C0032;
- April 4, 2019 – Review commenced;
- May 22, 2019 – Reviewer comments and recommendations due and received;
- May 30, 2019 – Responses received; and
- **August 29, 2019 – 2018 Annual Report presented to the Board for notification.**

3. Discussion

Part B, condition 10 of Licence MV2005L2-0015 and Condition 94 of Permit MV2005C0032 require De Beers to submit an Annual Report by March 31. Schedule 1 of Licence MV2005L2-0015 lists out the requirements of the annual report submission. The 2018 Annual Report was submitted on March 30, 2019 (attached).

In general, annual reports are not for approval since their purpose is to report on the information collected and activities conducted during that year, including the results of monitoring activities. As in previous years, the 2018 Annual Report for this project was distributed for public review.

4. Comments

Analysis of Adequacy of the 2018 Annual Report

Table 1 in the 2018 Annual Report outlines where each of the required Licence and Permit components are addressed. Table 1 below lists these components and details the adequacy of the submission.

Table 1: 2018 Annual Report Completeness

Topic Location	Components of the Annual Report: Schedule 1 of Licence and Condition 94 of Permit		Board staff analysis of the adequacy of the Annual Report in addressing the Components
1. a)	A summary of engagement activities conducted in accordance with the approved Engagement Plan, in Part B, item 11 of this Licence, undertaken during the previous calendar year and shall include a brief description of activities planned for the forthcoming year		De Beers has included a table summarizing community engagement conducted during the 2018 calendar year. Adequate.
1. b)	A summary of Construction and Project activities, including work carried out under the approved Dyke A Construction and Management Plan and Dyke Construction and Management Plan, conducted in accordance with Parts E and G of this Licence, undertaken during the previous year calendar year		De Beers has included a table summarizing work activities undertaken for each of the dyke projects in 2018. Adequate.
1. c)	An updated Project schedule		De Beers has included a table that illustrates the current project schedule that includes construction, operation, and closure activities. Adequate.
1. d)	A summary of Modification activities conducted in accordance with Part F of this Licence, undertaken during the previous calendar year		De Beers indicated that no modification, outside those already described for dykes and berms, occurred in 2018. Adequate.
1. e)	A summary of activities conducted in accordance with the approved Waste Management Plan, required in Part G, item 2 of this Licence, undertaken during the previous calendar year, including a summary of updates or changes to the process or facilities required for the management of Water and Wastewater		De Beers provided a brief history of changes made to the Waste Management Plan and provided highlights of waste management activities undertaken in 2018. Adequate.
1. f)	A summary of activities conducted in accordance with the approved Water Management Plan, relevant to the appropriate phase of the Project and as required in Part G, items 3, 4, and 5 of this Licence, undertaken during the previous calendar year, including	i. A summary of updates or changes to the process or facilities, including Drawdown activities, required for the management of Water and Wastewater	De Beers provided a brief description of the permanent diffuser which was installed in 2018 and stated there were no changes to the process or discharge rates during dewatering from the water management pond. Adequate.
		ii. The monthly and annual quantities in cubic meters (m ³) of Water obtained from Area 8	De Beers has included a table that lists the monthly and annual quantities of water obtained from Area 8 in 2018. Adequate.
		iii. The monthly and annual quantities in cubic meters (m ³) of Water obtained for downstream flow mitigation in Area 8, identified by source location	De Beers has included tables that lists the monthly and annual quantities of water obtained for downstream flow mitigation to Area 8 in 2018.

			Adequate.
		iv. During Drawdown of Kennady Lake, the monthly and annual quantities in cubic meters (m ³) of all Water Discharged from Kennady Lake to each Discharge location	De Beers has stated that there was no drawdown of Kennady Lake as the mine has entered the operational phase. Adequate.
		v. During Discharge from the Water Management Pond, the monthly and annual quantities of Discharge from the Water Management Pond to each Discharge location (Lake N11 and Area 8) when Discharge is occurring	De Beers has included a table that lists the monthly and annual quantities of Water discharged from the Water Management Pond in 2018. Adequate.
		vi. A comparison of Water and Wastewater quantities measured in the year to the Water balances predicted for that year in the approved Water Management Plan, and an explanation of any significant differences between predictions and actual measurements	De Beers has included tables that lists the cumulative water used and the volume of effluent discharged in 2018. Adequate.
		vii. Monthly elevations of Water in the Water Management Pond, areas 4, 6 and 7, Lakes A1, D2 and D3, and E1, including stage volume curves for each of these waterbodies	De Beers has included tables that lists the water levels in Areas 3/4/5 (the water management pond), Area 7, Lake A1, Lake D2/D3, and Lake E1, as well as a table for the stage volume curves for 2018. Adequate.
		viii. Monthly and annual quantities in cubic meters (m ³) of Water pumped from each Open Pit and Collection Pond, identifying the Discharge location	De Beers has included a table that lists the volumes of water pumped from the 5034 and Hearne pits in 2018. Adequate.
		ix. Monthly and annual quantities in cubic meters (m ³) of Water Discharged from each Waste Rock pile	De Beers stated that no water was discharged from any mine rock pile in 2018. Adequate.
		x. Monthly and annual quantities in cubic meters (m ³) of Water discharging from the processed kimberlite disposal facilities	De Beers provided an annual total of the volume of water that was pumped from the processed kimberlite disposal facility into the Water Management Pond for 2018 and stated that Dyke L (that contains the processed kimberlite in Area 2) is a filter dyke and any seepage through goes into the Water Management Pond and is re-used in the process plant. Adequate.
		xi. Monthly and annual estimates and measurements of precipitation and runoff	De Beers has included tables that list the monthly and annual quantities of precipitation and runoff for 2018. Adequate.

		xii. Monthly and annual amount of Water used for dust control	De Beers has included a table that lists the monthly and annual quantities of water used for dust control in 2018. Adequate.
		xiii. A summary and interpretation of monitoring results, including any Action Level exceedances described in the approved Water Management Plan	De Beers provided a brief summary of activities, including details on the action level exceedances that occurred for both fluoride and nitrate. Adequate.
		xiv. A description of actions taken in response to any Action Level exceedances	De Beers provided a brief summary of actions taken to address the action level exceedances for both fluoride and nitrate. Adequate.
		xv. An updated Water balance if required as per the approved Water Management Plan	De Beers has included figures and a table that show results of the calibration curves, water inputs and outputs, and projected water levels during mine operations. Adequate.
1. g)	A summary of activities conducted in accordance with the approved Groundwater Monitoring Program, required in Part G, item 6 of this Licence, undertaken during the previous calendar year, including	i. A summary and interpretation of monitoring results, including an evaluation of trends in Open Pit inflow quantity and quality	De Beers has included a table listing the groundwater volumes discharged in 2018. The groundwater model was recalibrated based on actual metrics and submitted to the Board in 2018. Adequate.
		ii. A comparison of monitoring results to predictions of Open Pit inflow quantity and quality, with an explanation for any significant differences	De Beers provided actual results and predictions to for both quantity and quality for Hearne and 5034 pits and stated that another seepage survey is planned for 2019 that will provide further information to help characterize the groundwater regime. Adequate.
		iii. A description of any updates to predictions	De Beers stated that the Site Water Quality model was updated in 2018. Adequate.
		iv. An assessment of the effects of Open Pit development on Groundwater movement and quality	De Beers submitted a report, as an appendix, that provided an assessment of effects to groundwater movement and/or quality as a result of pit development. Adequate.
		v. A summary of any Action Level exceedances under the Groundwater Monitoring Program	De Beers stated that no exceedances of action levels associated with groundwater occurred in 2018. Adequate.

		vi. A description of actions taken in response to Action Level exceedances	De Beers reiterated that there were no Action Level exceedances with groundwater in 2018. Adequate.
1. h)	A summary of activities conducted in accordance with the approved Erosion and Sediment Management Plan, required in Part G, item 11 of this Licence, undertaken during the previous calendar year including	i. A description of any erosion susceptible areas encountered and a summary of activities to prevent or mitigate erosion	De Beers has included tables that list out the sediment and erosion susceptible areas as well as a summary of the survey results. Photographs were also included as an appendix. Adequate.
		ii. A report of the performance of mitigations applied to each area	An erosion mitigation project was completed for one of the areas identified. This included creating a water diversion channel to address the surface erosion noted. Adequate.
1. i)	A summary of activities conducted in accordance with the approved Explosives Management Plan, required in Part G, item 12 of this Licence, undertaken during the previous calendar year including	i. Any Action Level exceedances and a description of actions taken in response to any Action Level exceedances	De Beers provided a summary of activities. No action level exceedances in the Explosives Management Plan were triggered. Adequate.
		ii. Updates on the success of management measures undertaken to reduce nitrate loadings to the Water Management Pond	De Beers provided a summary of measures undertaken to reduce the nitrate loadings into the water management pond. A figure was provided to show the accumulative nitrate loading in 2017 and 2018 which indicated that the nitrate loading has been reduced with time. Adequate.
1. j)	A summary of results of any monitoring and the Seepage surveys conducted in accordance with the approved Geochemical Characterization and Management Plan, required in Part G, item 14 of this Licence, undertaken during the previous calendar year, including	i. A comparison of the annual quantities of the different types of Waste Rock generated to predictions made in the approved Geochemical Characterization and Management Plan	De Beers has included tables that provide a summary of the Potentially Acid Generating samples collected in 2018. In total, 6.6% of the samples were classified as PAG, which is below the 7.5% that was predicted. Adequate.
		ii. A summary and interpretation of results from the geochemical monitoring required as per Schedule 5, item 7, including analysis results of any Seepage with runoff inputs to the Water Management Pond as well as any outside of the Controlled Area. Results shall be compared to appropriate reference locations in unaffected areas	De Beers has included tables that summarize the results of the acid-base accounting, the net acid generation, the shake flask extraction analysis, leachate analysis, and mineralogy. A table summarizing the physical parameters at each seepage and runoff location was also provided. Samples were also compared to a specific reference sample collected for each down-gradient sample collected. Comments and recommendations were received asking De Beers to include any interpretation or discussion of the significance of the concentrations that exceed the input

			<p>water chemistry values of results in all future Annual Reports.</p> <p>De Beers to include any interpretation or discussion of the significance in all future Annual Reports.</p>
		<p>iii. An overview analysis of major trends, site plans indicating the locations of Seepage, and summary of recommendations for future Seepage monitoring or management actions</p>	<p>De Beers has included a figure showing the locations of the seepage and runoff monitoring sampling locations visited during 2018. The full suite of trends was included as an appendix.</p> <p>Adequate.</p>
		<p>iv. An interpretation of the results of all survey data collected since Project inception with site plans indicating the locations of Seepage and the quality assurance and quality control procedures used</p>	<p>De Beers provided an interpretation of the results of the 2018 survey as an appendix which included the quality assurance and quality control procedures.</p> <p>Adequate.</p>
		<p>v. A summary of results from investigations or activities related to field test cells</p>	<p>Field test cells were constructed at the end of 2018. Operation of the cells is expected to begin in 2019.</p> <p>Adequate.</p>
		<p>vi. A summary and interpretation of Water quality monitoring results for each of the main source areas (Waste Rock piles, Open Pits, camp pad, and airstrip) and how these compare to predicted values</p>	<p>De Beers stated that water samples were submitted for analysis and results were compared to the water quality model. A complete tabular summary of all results was submitted as an appendix.</p> <p>Adequate.</p>
		<p>vii. A summary of any exceedances of the Action Levels described in the Geochemical Characterization and Management Plan</p>	<p>De Beers has included a table that provides a tabular summary of the Action Levels exceedances in 2018 and the associated management responses.</p> <p>Comments and recommendations were received asking De Beers to clarify if any management responses were initiated and/or planned as a result of an action level exceedance, for nutrients, metals and routine parameters, as monitoring results indicated that action level exceedances occurred during both seepage sampling events.</p> <p>De Beers responded that results were based on samples that were inappropriately collected, from stagnant water instead of active seepage, and corrective actions are being implemented in the 2019 bi-annual seepage audit program.</p>

			<p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p> <p>A review and update (including cross referencing) of the sampling practices as outlined in the Geochemical Characterization and Management Plan, the Operational Water Management Plan, and the Quality Assurance and Quality Control Plan is required. If changes are required, an update to the plans (as applicable) shall be submitted to the Board or Analyst (as applicable) for approval.</p>
		viii. A description of actions taken in response to any Action Level exceedances under the Geochemical Characterization and Management Plan	<p>In response to the exceedances, De Beers provided a table that outlined the management responses taken to address each of the Action Levels exceedances.</p> <p>Adequate.</p>
		ix. Any geochemical inspections reports from the preceding year, as appendices to the Annual Water Licence Report	<p>De Beers provided a detailed summary of the geochemical characterization screening that occurred in 2018 as an appendix.</p> <p>Adequate.</p>
1. k)	A summary of activities conducted in accordance with the approved Processed Kimberlite and Waste Rock Management Plan, required in Part G, item 17 of this Licence, undertaken during the previous calendar year, including	i. A summary of updates or changes to the process or facilities required for the management of Processed Kimberlite, Waste Rock, and Overburden	<p>The Processed Kimberlite and Mine Rock Management Plan was updated in 2018 to address the adjusted mine plan which resulted in extra mine rock.</p> <p>Adequate.</p>
		ii. The monthly and annual quantities in cubic meters (m ³) and tonnes (t) of Overburden removed from each Open Pit and its deposition location	<p>De Beers has included tables that lists the monthly and annual quantities of Waste Rock and Overburden removed from each Open Pit and its deposition location in 2018.</p> <p>Adequate.</p>
		iii. The monthly and annual quantities in cubic meters (m ³) and tonnes (t) of Waste Rock placed in the South Mine Rock Pile and the West Mine Rock Pile, identifying the classification of quantities of each rock type, geochemical classification and its disposal location	<p>De Beers has included a table that lists the monthly and annual quantities of Waste Rock placed in the South and West Mine Rock Piles in 2018.</p> <p>Adequate.</p>
		iv. The monthly and annual quantities in cubic meters (m ³) of Waste Rock placed for Construction activities, including an updated map or diagram showing the location and Waste Rock classification of the deposited materials	<p>De Beers has included a table that lists the monthly and annual quantities of Waste Rock used for Construction and included several figures showing the placement of Waste Rock.</p> <p>Adequate.</p>
		v. The monthly and annual quantities in cubic meters (m ³) of Waste Rock placed in the 5034 Open Pit and the Hearne	<p>De Beers stated that no Waste Rock was placed in 5034 or Hearne pits in 2018.</p>

		Open Pit; including an updated map or diagram showing the location and Waste Rock classification of the deposited materials	Adequate.
		vi. The monthly and annual quantities in cubic meters (m ³) and tonnes (t) of Processed Kimberlite placed in each of the Coarse Processed Kimberlite Containment Facility, the Fine Processed Kimberlite Containment Facility, the 5034 Open Pit and the Hearne Open Pit	De Beers has included a table that lists the monthly, annual, and cumulative quantities of Coarse PK deposited to the Coarse PK Containment Facility. No PK was deposited to the 5034 Pit or the Hearne Pit in 2018. Adequate.
		vii. The monthly and annual quantities in cubic meters (m ³) and tonnes (t) of slurry deposited in each of the Fine Processed Kimberlite Containment Facility and the Hearne and 5034 Open Pits	De Beers has included a table that lists the monthly, annual, and cumulative quantities of Fine PK deposited to the Fine PK Containment Facility. No PK was deposited to the 5034 Pit or the Hearne Pit in 2018. Adequate.
		viii. The monthly, annual and cumulative quantities in cubic meters (m ³) and tonnes (t), and locations of any Overburden, Processed Kimberlite, Waste Rock or ore stockpiles	De Beers has included a table that lists the monthly, annual, and cumulative quantities of materials placed in the ore and mine rock piles. There were no stockpiles of Waste Rock or PK in 2018. Adequate.
		ix. The annual quantities in cubic meters (m ³) and tonnes (t) of other solid Waste, placed in each of the South Mine Rock Pile and West Mine Rock Pile	De Beers stated that there was 4,629 m ³ of non-hazardous waste was deposited at the South Mine Rock Pile Landfill and a negligible amount was deposited to the West Mine rock Pile Landfill during 2018. Adequate.
		x. A summary and interpretation of monitoring results, including any Action Level exceedances	De Beers stated that geotechnical inspections to assess the stability, deformation and signs of erosion of the Waste Rock piles, the Coarse PK Pile, and the Fine PK Containment Facility are conducted on an annual basis. The dykes are also monitored on a weekly basis for signs of seepage, erosion, and deformation. There were no instances of instability or deformation noted at any of these facilities in 2018. Adequate.
		xi. A description of actions taken in response to any Action Level exceedances	De Beers stated that there were no Action Level exceedances in 2018. Adequate.
1. l)	A summary of activities conducted in accordance with the approved Spill Contingency Plan, required in Part H,	i. A list and description for all Unauthorized Discharges that occurred during the previous calendar year, including the date, NWT spill number, volume, location, summary of the circumstances and follow-up actions	De Beers has included a table that provides a summary of Unauthorized Discharges in 2018. Detailed information was included as an appendix. Adequate.

	item 1 of this Licence, undertaken during the previous calendar year, including	taken, and status (i.e. open or closed), in accordance with the reporting requirements in Part H, item 3 of this Licence	
		ii. An outline of any spill training and communications exercises carried out during the previous calendar year	De Beers stated that no targeted spill training occurred in 2018, spill prevention training was provided as part of normal induction procedures. The last training occurred in 2017 and involved both classroom and hands-on activities. The next training is scheduled for 2019. Adequate.
1. m)	A progress report on any studies or plans, including Aquatic Effects Monitoring Program Response Plans and any Reclamation Research Plans, requested by the Board and undertaken during the previous calendar year, and a brief description of any future studies planned by the Licensee		De Beers stated there were two low action levels triggered under the AEMP (provided a summary of the actions taken) and confirmed that results of the research conducted under the Reclamation Research Plan would be included in the Annual Closure and Reclamation Progress Report. Adequate.
1. n)	Any other details on Water Use or Waste disposal requested by the Board by November 30 of the year being reported		De Beers provided a brief overview of the amendment applications submitted in 2018 to address the adjusted mine plan which resulted in extra mine rock. Adequate.
1. o)	A summary of the activities carried out to implement measures and follow-up programs to address Water Use and protection of Water quality as identified by the Minister in the Report of Environmental Impact Review 0607-001		De Beers provided a summary of activities conducted under the AEMP and SNP. Adequate.
1. p)	A table detailing all commitments made during Environmental Impact Review 0607-001 and the subsequent regulatory processes, with descriptions of how each commitment is being, or has been, met		De Beers has included a table, as an appendix, that details the status of each commitment made by De Beers during the Environmental Impact Review and subsequent regulatory Processes. Adequate.
1. q)	A summary of the calibration and status of the meters and devices referred to in Part B, item 8 of this Licence		De Beers has included a table that provides a summary of the QA/QC measures implemented in 2018 as a component of the collection of flow and volume measurements. Adequate.
1. r)	Tabular summaries of all data and information generated under the Surveillance Network Program and graphical summaries of parameters with effluent quality criteria referred to in Part G, at the points of compliance (Surveillance Network Program sites 02 and 04), in excel or an electronic and printed format acceptable to the Board. The Licensee shall provide raw data in electronic form to the Board		De Beers has included several tables that summarize the sampling requirements, physical parameters, water/sediment/effluent quality results, and flow and volume data, as well as several figures. Adequate.

1. s)	A list of submissions made to the Board during the previous calendar year	De Beers has included a table, listing out the submissions made to the MVLWB in 2018 as related to work activities covered by the Water Licence and Land Use Permit. Adequate.
1. t)	A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector	De Beers has included a table that provides a summary of issues identified as unacceptable in reports filed by the Inspector during 2018, and the actions taken by De Beers to address any non-conformances. Adequate.
94. (Permit)	Beginning March 31, 2015 and no later than every March 31 thereafter, the Permittee shall submit an Annual Land Use Permit Report to the Board, which shall contain a table detailing all commitments listed in the Report of Environmental Impact Review that are related to the content of this Permit, with descriptions of how each commitment is being or has been met	De Beers has included a table, as an appendix, that details the status of each commitment made by De Beers during the Environmental Impact Review and subsequent Regulatory Processes. Adequate.

5. Public Review

By May 22, 2019, comments and recommendations on the 2018 Annual Report were received from four reviewers:

- Environment and Climate Change Canada (ECCC)
- Fisheries and Oceans Canada
- Government of the Northwest Territories-Environment and Natural Resources (GNWT-ENR)
- Board staff

De Beers responded by May 30, 2019. The Review Summary and Attachments (attached) presents the comments identified through the review of the 2018 Annual Report.

The following summarizes the main issues raised during the review:

Fisheries and Oceans Canada stated that they had no comments at this time.

The majority of the ECCC, GNWT-ENR, and Board staff comments were addressed or clarified in De Beers' responses. De Beers has also acknowledged that an updated Annual Report will be submitted to address updates required to reflect some inconsistent/missing information or that future Annual Reports will address the recommendations.

6. Security

The Board has set security in the amount of \$23,776,270.00 as per Part C, condition 1 and Schedule 2 of Licence MV2005L2-0015 and \$13,844,096.00 as per Condition 56 of Permit MV2005C0032 for the Gahcho Kue project. De Beers' next deposit of security (in the amount of \$17,732,485.00 under Licence MV2005L2-0015 and \$24,675,843.00 under Permit MV2005C0032) is due prior to year 5 of Operations (the end of mining of the Hearne Pit).

No changes to the security are proposed.

7. Conclusion

Board staff conclude that further information was provided by De Beers in their responses to reviewer comments.

8. Recommendation

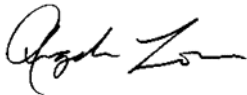
Board staff recommend the Board **acknowledge the 2018 Annual Water Licence Report**, as submitted to fulfill Part B, condition 10 of Licence MV2005L2-0015 and Condition 94 of Permit MV2005C0032 and require De Beers to submit a revised 2018 Annual Water Licence Report, to include the information identified in the reviewer comment summary table, by September 26, 2019.

A draft acknowledgement letter is attached.

9. Attachments

- [2018 Annual Report](#)
- Review Summary and Attachments
- Draft Acknowledgement Letter from the Board

Respectfully submitted,



Angela Love
Regulatory specialist

Review Comment Table

Board:	MVLWB
Review Item:	De Beers Gahcho Kue - 2018 Annual Report (MV2005C0032 and MV2005L2-0015)
File(s):	MV2005C0032 MV2005L2-0015
Proponent:	De Beers Canada Inc - Gahcho Kue
Document(s):	2018 Annual Report (86.29 MB)
Item For Review Distributed On:	Apr 4 at 11:16 Distribution List
Reviewer Comments Due By:	May 22, 2019
Proponent Responses Due By:	May 29, 2019
Item Description:	<p>De Beers Canada Inc. (De Beers) submitted their 2018 Annual Water Licence Report (Report) on March 30, 2019. This Report is required by Land Use Permit (Permit) MV2005C0032, Condition 94 and Water Licence (Licence) MV2005L2-0015, Part B, condition 10 and Schedule 1.</p> <p>Although formal approval of this Report not required under the Licence, the Board must be satisfied that the Licensee has met the requirements of the Licence. Therefore, reviewers are invited to submit comments and recommendations using the Online Review System (ORS) by the review comment deadline specified below. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the proponent prior to submitting comments and recommendations.</p> <p>All documents that have been uploaded to this review are also available on our public Registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below.</p>
General Reviewer Information:	<p>In addition to the email distribution list, the following organizations received review materials by fax:</p> <p>Northwest Territory Métis Nation; Tim Heron; NWTMN IMA Coordinator; (867) 872-3586; rcc.nwtmn@northwestel.net</p>
Contact Information:	<p>Angela Love 867-766-7456 Jen Potten 867-766-7468</p>

Comment Summary

Environment and Climate Change Canada: Russell Wykes				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
4	General File	Comment (doc) ECCC Cover Letter Recommendation		Noted.
1	Topic: Nitrate loadings References: 1) Section 10.2 Updates on the success of management measures undertaken to reduce nitrate loadings to the Water Management Pond 2) Figure 10-1 Accumulative Nitrate Loading from Pit Dewatering in 2017 and 2018	Comment In order to address increasing trends, measures have been undertaken to reduce nitrate loading to the Water Management Pond (WMP). According to Section 10.2 of the 2018 annual report, nitrate loading due to pit dewatering has been reduced in 2018 through the implementation of mitigation strategies. Figure 10-1 illustrates nitrate loading to the WMP from pit dewatering in 2017 and 2018, and provides a comparison between the two years. On-going graphical comparisons of nitrate loading data (i.e., comparing current year data to historic data) would support the continued tracking of pit dewatering loading trends. Recommendation ECCC recommends that future annual reports continue to provide graphical comparisons of accumulative nitrate loadings to the Water Management Pond from pit dewatering by comparing current year data with historic loading data.	May 30: Acknowledged. De Beers plans to continue to track nitrate loadings from the pit dewatering and report them in the Annual Report.	Noted. In future submissions of the Annual Water Licence Report, De Beers is to continue to include a graphical comparisons of accumulative nitrate loadings to the Water Management Pond from pit dewatering by comparing current year data with historic loading data.
2	Topic: Seepage Surveys References: 1) Table 11-16 Summary of Action Level Exceedances in 2018, as Defined in the Geochemical Characterization and Management Plan 2) Appendix D – Geochemical Audit Technical Report, 2018	Comment Seepage surveys, as described in the Geochemical Characterization and Management Plan, were conducted in June and September of 2018. Survey locations included the AN storage pad; Airstrip; Dykes A, A1, F, G, H, I and J; N11 road; distal from the mine; South Mine Rock Pile; CPK Pile and the ROM	May 30: As discussed in responses to GNWT #4 and 5, the higher than expected concentrations were results of collecting samples from stagnant water ponding, instead of active seepage or runoff. The inappropriate sampling methods during the 2018 seepage audit program were recognized	Noted. Board staff appreciates De Beers' explanation of why higher than expected concentrations were a result of collecting samples from stagnant water ponding, instead

		<p>Pad. Monitoring results indicate action level exceedances occurred during both seepage sampling events, with generally more parameter exceedances in the fall than spring. Action level exceedances include elevated levels of metals and routine parameters in several downgradient samples, some of which also exhibited elevated nutrients. Minimal information has been provided regarding whether any management responses resulted from these action level exceedances.</p> <p>Recommendation ECCC recommends that the Proponent describe whether any management responses were initiated and/or planned as a result of the action level exceedances (nutrients, metals and routine parameters), and describe any associated changes to monitoring and/or mitigation.</p>	<p>during the review of the geochemical audit report and corrective actions are being implemented in the 2019 bi-annual seepage audit program. Seepage sampling will focus on active seepage from the mine rock/CPK pile/dykes or from the water ponding that collect active seepages/runoff.</p>	<p>of active seepage or runoff.</p> <p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p> <p>A review and update (including cross referencing) of the sampling practices as outlined in the Geochemical Characterization and Management Plan, the Operational Water Management Plan, and the Quality Assurance and Quality Control Plan is required. If changes are required, an update to the plans (as applicable) shall be submitted to the Board or Analyst (as applicable) for approval.</p>
3	<p>Topic: Air Quality Comments - Gachcho Kue 2018 Annual Report</p>	<p>Comment In its Commitments Table (Appendix F, page F-47), De Beers indicated that it will make available the results of the air quality monitoring programs and emission estimates through public submission of the annual report. However, the 2018 Annual Water License and Land Use Permit Report does not contain any results of air monitoring from the Project, and no other report with air monitoring results has been made available to ECCC.</p> <p>Recommendation ECCC requests that the De Beers make available</p>	<p>May 30: The air quality and emission monitoring data will be included in the Annual Air Quality Report under the Air Quality and Emission Monitoring Management Plan (AQEMMP). The annual air quality reports have been submitted to MVLWB, GNWT, and ECCC each year in the past. De Beers is scheduled to submit the 2018 Air Quality Report to MVLWB, GNWT, and ECCC in June 2019. The latest version of the approved AQEMMP is available at the MVLWB</p>	<p>Noted.</p> <p>In future submissions of the Annual Water Licence Report, De Beers should ensure that all information committed to being submitted has been provided. Rational should be provided for circumstances when information, previously committed to, has not been included.</p>

		the result of air quality monitoring activities from 2018, as well as the most recent version of the Air Quality Emissions Management and Monitoring Plan. ECCC requests the opportunity to provide comments on these results when they are made available.	registry: http://registry.mvlwb.ca/Documents/MV2005C0032/MV2005C0032%20MV2005L2-0015%20-%20De%20Beers%20Gahcho%20Kue%20-%20Air%20Quality%20and%20Emissions%20MMP%20-%20Version%203%20-%20Oct19-15.pdf	
Fisheries and Oceans Canada: Laura Watkinson				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	General	Comment DFO has reviewed the De Beers Gahcho Kue - 2018 Annual Report in accordance with its mandate and has no comments at this time. Recommendation N/A	May 30: Acknowledged.	Noted.
GNWT - ENR: Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
2 1	General File	Comment (doc) ENR Letter with Comments and Recommendations Recommendation		Noted.
1	Topic 1: Current Project Schedule	Comment Table 4-1 outlines the Current Project schedule including construction and closure. ENR notes that in the 2017 Annual Report, progressive reclamation of the coarse processed kimberlite (CPK) pile is anticipated to begin in 2021, while the 2018 Annual Report, it begins in 2025. It isn't clear why the schedule has changed. Recommendation 1) ENR recommends that in future Annual Reports, De Beers identify any changes in project schedule.	May 30: Acknowledged.	Noted. In future submissions of the Annual Water Licence Report, De Beers is to identify any changes to the project schedule.
2	None	Comment None Recommendation 2) ENR recommends De Beers provide	May 30: The CPK Pile progressive reclamation timeline in the 2017 Annual	Noted.

		rationale for delaying progressive reclamation of the CPK pile, as well as a description of any other changes to the project schedule since the 2017 Annual Report.	report was inaccurate. Based on the 2018 Project Description and latest Processed Kimberlite and Mine Rock Management Plan, the CPK pile will not reach its final footprint and height until Year 9 (2024) of the operation. The start of the progressive reclamation will therefore not start until one year after the CPK placement.	In future submissions of the Annual Water Licence Report, De Beers is to include an explanation for any of the changes to the project schedule.
3	Topic 2: Seepage Survey Dates	<p>Comment Section 11, page 51 states that seepage surveys were conducted June 10-15, 2018 and September 30, 2018. Page 73 states that seepage and runoff surveys were completed May 28-30, 2018 and September 10-12, 2018.</p> <p>Recommendation 1) ENR recommends that De Beers clarify the dates of the seepage surveys.</p>	<p>May 30: The spring seepage survey was carried out between May 28 and 30, 2018, the fall program was carried out between September 10 and 12 2018. The 2018 Annual Report Ver.1.1 will be updated to reflect the correct sampling dates.</p>	<p>Noted.</p> <p>De Beers to update section 11 of the Annual Report with the corrected information.</p> <p>Include this item in a conformity table to indicate where in the Annual Report this item has been addressed.</p>
4	Topic 3: Seepage Sampling Locations and Protocol	<p>Comment According to Tables 11-3 and 11-4, the majority of seepage sample locations had no visible water flow during the spring and fall surveys. The spring survey noted several locations were ice covered, and the fall survey noted several locations that were dry. The 2018 Bi-Annual Geochemical Audit, Performance Monitoring Report (Tetra Tech, 2018) in Appendix D states that 28 samples were collected in the spring event, and 23 were collected in the fall. Section 4.2.2 of the Geochemical Audit (Tetra Tech, 2018) notes that exceedances in sample DI-01 of aluminum, cadmium, lithium, manganese, nickel, zinc, etc. ".may be due to standing water and annual evaporation, and not</p>	<p>May 30: De Beers agrees with GNWT's comment that one of the intents of the seepage sampling program is to monitor the change in seepage water quality, and to compare with the water quality model inputs. De Beers recognized that majority of the 2018 seepage samples were collected from stagnant water ponding. As concentrations of constituents in isolated water ponding are highly influenced by the wet and dry cycle, and have much higher contact and retention time with surrounding materials, they are not representative of the true seepage water quality. In the</p>	<p>Noted.</p> <p>Board staff appreciates De Beers' explanation of why higher than expected concentrations were a result of collecting samples from stagnant water ponding, instead of active seepage or runoff.</p> <p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p> <p>A review and update (including cross</p>

		<p>due to dyke seepage." Given that the majority of samples were collected from areas where no flow was visible, and ice was present in the spring, it isn't clear that the results of this program are truly representative of waste rock geochemistry and influences on seepage and surface runoff.</p> <p>Recommendation 1) ENR recommends that De Beers clarify the goal of this geochemical sampling program. If the goal is to characterize the water quality of seepage and runoff interacting with waste rock on site, ENR recommends that samples only be collected when visible flow is present and the water can be seen to be exiting the waste rock pile/structure.</p>	<p>2019 biannual seepage sampling program, De Beers will only sample and report active seepage water quality results.</p>	<p>referencing) of the sampling practices as outlined in the Geochemical Characterization and Management Plan, the Operational Water Management Plan, and the Quality Assurance and Quality Control Plan is required. If changes are required, an update to the plans (as applicable) shall be submitted to the Board or Analyst (as applicable) for approval.</p>
5	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that De Beers consider conducting the spring seepage survey slightly later in the spring to avoid ice covered conditions at the sample locations.</p>	<p>May 30: Agreed. De Beers will only collect active seepage samples or sample from water ponding that collect active seepage/runoff. We will also avoid collecting any under-ice water samples.</p>	<p>Noted.</p> <p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p> <p>A review and update (including cross referencing) of the sampling practices as outlined in the Geochemical Characterization and Management Plan, the Operational Water Management Plan, and the Quality Assurance and Quality Control Plan is required. If changes are required, an update to the plans (as applicable) shall be</p>

				submitted to the Board or Analyst (as applicable) for approval.
6	Topic 4: Table 11-10 - Parameters selected from the Shake Flask Extraction (SFE) Analysis (Mine Rock)	<p>Comment ENR compared the parameters selected for Table 11-10 in the 2018 Annual Report, to the corresponding table (Table 11-7a) in the 2017 Annual Report and noted that 3 additional parameters are listed in the 2018 Annual Report: dissolved aluminum, copper, and uranium. ENR also noted that vanadium was not included in the 2018 table although it had been included in the 2017 table. ENR notes similar parameter changes between Table 11-12 (2018 Annual Report) and the corresponding Table 11-8a (2017 Annual Report), as well as Table 11-13 (2018 Annual Report) and corresponding Table 11-8b (2017 Annual Report). ENR notes that there is no discussion regarding how these parameters are selected, or why the list of selected parameters could change year to year.</p> <p>Recommendation 1) ENR recommends that De Beers clarify why the selected parameters for SFE results have changed in 2018, and that selection criteria or rationale be provided for the parameters being presented in future Annual Reports.</p>	<p>May 30: All SFE parameters are provided in the Appendix D tables. The report tables provide select parameters for review. The selection criteria is generally to illustrate metals that are higher than steady state or first flush values. Previous years' reports also included a random selection of other parameters. Future reports will highlight only values that exceed first flush or steady state in report, and present the remaining elements in the appendix.</p>	Board staff note that the provided tables were only selected parameters that highlighted any metals that were higher than steady state or first flush values. The full results were provided as an appendix.
7	Topic 5: Geochemical Monitoring – Shake Flask Extraction Results	<p>Comment Section 11.2 contains a summary of the geochemical monitoring results, including results of shake flask extraction analysis compared to the input water chemistry for "Unsaturated Mine Rock - Granite (Non-PAG)" used in water quality modelling. De Beers notes a number of analyzed parameters that exceed</p>	<p>May 30: Acknowledged. 2019 and future Annual Reports will include discussions on SFE and NAG extract leachate analysis results.</p>	<p>Noted.</p> <p>In future submissions of the Annual Water Licence Report, De Beers is to include an interpretation or discussion of the significance of the concentrations that exceed the input</p>

		<p>the steady state and first flush values, with other parameters exceeding the steady state, but below first flush values for both mine rock and kimberlite samples. However, neither this section nor Appendix D contain any interpretation or discussion of the significance of the concentrations that exceed the input water chemistry values.</p> <p>Recommendation 1) ENR recommends that De Beers include interpretation of results in all future Annual Reports as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.ii).</p>		water chemistry values.
8	Topic 6: Appendix D - Geochemical Audit - NP Determination Methodologies	<p>Comment It isn't clear why the Modified Sobek method was used for analysis of the spring audit samples, and the Standard Sobek method was used in analysis for the fall audit samples.</p> <p>Recommendation 1) ENR recommends that De Beers provide rationale for using two different NP determination methodologies during the 2018 bi-annual geochemical audit.</p>	<p>May 30: De Beers did not intend to use two different methods. De Beers has elected to use the Standard Sobek method in previous years, and moving forward for consistency and ease of comparison year-to-year, the Standard Sobek method will be used for all samples. The Standard Sobek method is listed as an appropriate method for neutralization potential determination in the MEND Guidelines (Price, 2009)</p>	Board staff note that De Beers has agreed to use the Standard Sobek method for all samples to allow for consistency and ease of comparison of the year-to-year analysis moving forward.
9	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that De Beers clarify which method will be used for future geochemical audits, and provide justification for selecting that method.</p>	<p>May 30: See response to GNWT #8.</p>	Noted.
10	Topic 7: Table 11-16 Management Responses	<p>Comment ENR notes that not all management responses in Table 11-16 address the action level exceedances as laid out in the Geochemical Characterization and Management Plan. For example, a number of seepage samples exceeded multiple action levels; however, none of</p>	<p>May 30: As pointed out by GNWT #4 and 5, higher than expected concentrations were results of collecting samples from stagnant water ponding, instead of active seepage or runoff. The inappropriate sampling methods during the 2018</p>	<p>Noted.</p> <p>Board staff appreciates De Beers' explanation of why higher than expected concentrations were a result of collecting samples from stagnant</p>

		<p>the management responses such as: review pH test procedure, collect and analyze follow up confirmation sample, increase frequency of monitoring, investigate alternative mitigation strategies, etc. are included. ENR notes that it isn't clear how the various management responses are categorized in terms of low, medium, high action level exceedances. It would be helpful to clarify this in the Annual Water Licence Reports as well as the Geochemical Characterization Management Plan.</p> <p>Recommendation 1) ENR recommends that De Beers clarify management responses taken to address the seepage action level exceedances.</p>	<p>monitoring program were recognized during the review of the geochemical audit report and corrective actions are being implemented during the 2019 bi-annual geochemical audit program. Seepage sampling will focus on active seepage from the mine rock/CPK pile/dykes or from the water ponding that collect active seepages/runoff.</p>	<p>water ponding, instead of active seepage or runoff.</p> <p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p> <p>A review of the sampling practices and response framework (specifically Table 7) outlined in the Geochemical Characterization and Management Plan (the Plan) is required. An update may be required to better reflect how exceedances are evaluated and what responses are based on the evaluation of a particular exceedance (e.g., simply continue monitoring, increase monitoring, or need to implement some kind of mitigation).</p> <p>If changes are required, an updated Plan shall be submitted for Board approval.</p>
1 1	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that the level of management response (low, medium, high) being applied is included in Table 11-16.</p>	<p>May 30: One of the intents of the seepage sampling program is to provide monitoring data to validate the site water quality model. The management responses were also included to trigger operation/construction actions or future model updates. De Beers deems</p>	<p>A review of the sampling practices and response framework (specifically Table 7) outlined in the Geochemical Characterization and Management Plan (the Plan) is required.</p>

			the current responses framework is adequate.	<p>An update may be required to better reflect how exceedances are evaluated and what responses are based on the evaluation of a particular exceedance (e.g., simply continue monitoring, increase monitoring, or need to implement some kind of mitigation).</p> <p>If changes are required, an updated Plan shall be submitted for Board approval.</p>
1 2	Topic 8: Spring and Fall Seepage Sample Metal Exceedances	<p>Comment Sections 4.2.2 and 4.2.4 of Appendix D notes a number of seepage sample exceedances relative to water chemistry source term predictions - steady state and first flush - during both the spring and fall surveys. ENR notes that the document does not provide any discussion or interpretation of the significance of the exceedances.</p> <p>Recommendation 1) ENR recommends that in future Annual Reports, a discussion of results should be provided detailing the significance of any deviations from source term predictions, potential causes of any exceedances, and mitigation measures to be implemented, if applicable.</p>	May 30: Acknowledged. De Beers will include discussions on the monitoring results in the future.	<p>Noted.</p> <p>In future submissions of the Annual Water Licence Report, De Beers is to include a discussion of the results detailing the significance of any deviations from source term predictions, potential causes of any exceedances, and mitigation measures to be implemented.</p>
1 3	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that, given the number of parameter concentrations that exceeded the input water chemistry values, De Beers consider establishing action levels and associated management</p>	May 30: The current response framework includes the comparison to concentrations outside of normal range. Further, as discussed for GNWT #10 and #11, De Beers will conduct a corrected seepage sampling program in 2019. Depending	<p>Noted.</p> <p>De Beers is to ensure that proper collection of samples occurs in the future to ensure accuracy of the results to capture any areas of potential concern.</p>

		responses for metal leaching in the Geochemical Characterization and Management Plan. This will support adaptive management during operations, and help inform closure and post closure monitoring.	on the 2019 seepage survey results, De Beers will have a review of the effectiveness of the response framework.	<p>A review of the sampling practices and response framework (specifically Table 7) outlined in the Geochemical Characterization and Management Plan (the Plan) is required. An update may be required that establishes action levels and associated management responses for metal leaching.</p> <p>If changes are required, an updated Plan shall be submitted for Board approval.</p>
1 4	Topic 9: Seepage Trend Analysis	<p>Comment De Beers states in Section 11.3 of the 2018 Annual Report that trend analysis of seepage and runoff survey data was conducted by completing Mann-Kendall tests, and that the full suite of trends are included in Appendix D, but they do not appear to have been included.</p> <p>Recommendation 1) ENR recommends that De Beers provide an overview analysis of major trends as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iii).</p>	<p>May 30: De Beers intended to conduct a trend analysis and interpretation of previous monitoring results as per Water Licence conditions (Schedule 1, Part B, Item 10, 1.j.iii and 1.j.iv). However, it was determined it was too early to conduct such analysis. As the seepage sampling program only started in September 2016, in many cases there were only three sample points to analyze. Once the lab analysis is available after the 2019 sampling program, De Beers will access if the dataset is sufficient to conduct trend analysis and will include discussions the assessment in the 2019 Annual Report.</p>	<p>Noted.</p> <p>In future submissions of the Annual Water Licence Report, De Beers is to include an overview analysis of major trends as required by Schedule 1, Part B, condition 10, 1.j.iii of Licence MV2005L2-0015.</p>
1 5	Topic 10: Interpretation of the Results of all Survey Data Collected since Project Inception	<p>Comment ENR notes that the 2018 Annual Report, as well as Appendix D are focused on the 2018 data, and do not provide an</p>	<p>May 30: Please see response for GNWT #14.</p>	<p>Noted.</p> <p>In future submissions of the Annual Water</p>

		<p>interpretation of the results of all survey data collected since project inception as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iv).</p> <p>Recommendation 1) ENR recommends that De Beers provide an interpretation of results of all survey data collected since project inception as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iv).</p>		<p>Licence Report, De Beers is to include results of all survey data collected since project inception, and an interpretation of the results if possible, as required by Schedule 1, Part B, condition 10, 1.j.iv of Licence MV2005L2-0015.</p>
1 6	Topic 11: SNP-06	<p>Comment Based on GNWT-ENR comment ID-4 made during the review of the 2017 Annual Report, the Board directed De Beers to "include a narrative description and interpretation of parameters of concern, detailing influences that can be attributed from the Fine PKC Facility on the Water Management Pond" in future iterations of the Annual Report, starting with the March 31, 2019. ENR notes that the 2018 Annual Report does not contain such a description.</p> <p>Recommendation 1) ENR recommends that De Beers provide the "description and interpretation of parameters of concern, detailing influences that can be attributed from the Fine PKC Facility on the Water Management Pond" in order to satisfy the direction from the Board.</p>	<p>May 30: The appropriate section in the 2018 Annual Report Ver. 1.1 will be updated to incorporate the GNWT Comment #16.</p>	<p>Noted.</p> <p>De Beers to update the Annual Water Licence Report as requested by the Board in the July 5, 2018 letter.</p> <p>Include this item in a conformity table to indicate where in the Annual Report this item has been addressed.</p>
1 7	Topic 12: SNP-07 Fecal Coliform Exceedance	<p>Comment The fecal coliform count in the October 2nd sample was 61 MPN/100mL, which exceeded the effluent quality criteria (EQC) of 20 MPN/100mL. Given that the membrane bioreactors weren't investigated until October 16, the effluent was potentially out of compliance for up to two weeks. ENR notes that the 2018 Annual Report does not discuss any</p>	<p>May 30: Agreed. As described in the Annual Report, De Beers worked with the GNWT Lands Inspector in implementing all necessary correctives actions. Fecal coliform samples were not collected at the downstream locations, as the incident occurred during winter month. If fecal coliform in</p>	<p>Board staff note that if fecal coliform in the SNP-07 sample exceeds the EQC level during the summer months, then De Beers has agreed to sample the downstream water containment facility for fecal coliform to ensure it does not exceed the EQC level.</p>

		<p>additional investigations or confirmatory sampling in Area 7 or the Water Management Pond (WMP) to investigate whether untreated effluent impacted Area 7 or the WMP.</p> <p>Recommendation 1) ENR recommends that if future exceedances occur, De Beers sample the effluent storage location to ensure that the effluent in those locations does not exceed the SNP-07 fecal coliform EQC.</p>	<p>the SNP-07 sample exceeds the EQC level during the summer months again. De Beers will sample the downstream water containment facility for fecal coliform to ensure it does not exceed the SNP-07 EQC level.</p>	<p>In future submissions of the Annual Water Licence Report, De Beers is to include a discussion of exceedances and any additional investigations or confirmatory sampling taken.</p>
18	None	<p>Comment None</p> <p>Recommendation 2) ENR recommends that future Annual Reports include a summary of corrective actions that have been put in place to ensure such issues are prevented going forward.</p>	<p>May 30: A summary of the corrective actions was included in Section 19.1.4. of the Annual Report.</p>	<p>Board staff note that section 19.1.4 provided a summary of the corrective actions taken to address the exceedance but does not discuss how the exceedance may be prevented in the future.</p> <p>In future submissions of the Annual Water Licence Report, should exceedances be noted, De Beers is to include a summary of corrective actions that have been put in place to help prevent exceedances going forward.</p>
19	Topic 13: Seepage from South Mine Rock Pile-Board Direction	<p>Comment In response to GNWT-ENR comment ID-6 on the 2017 Annual Report, the Board directed De Beers "to include appropriate reference values to the table associated with the 'Laboratory Analytical Results for</p>	<p>May 30: Agreed. Reference values will be included in Table 19-29 of the Annual Report.</p>	<p>Noted.</p> <p>De Beers to update the Annual Water Licence Report as requested by the Board in the July 5, 2018 letter.</p>

		<p>Samples collected at SNP-12' and to provide a narrative description, detailing the magnitude of any deviations between results and predictions and outlining potential causes and mitigations, if applicable." ENR notes that the reference values have not been provided in Table 19-29 (results from SNP-12).</p> <p>Recommendation 1) ENR recommends that De Beers provide the reference values associated with Table 19-29 in order to satisfy the direction from the Board.</p>		<p>Include this item in a conformity table to indicate where in the Annual Report this item has been addressed.</p>
20	<p>Topic 14: Seepage from Coarse Processed Kimberlite Pile</p>	<p>Comment In response to GNWT-ENR comment ID-7 on the 2017 Annual Report, the Board directed De Beers "to include appropriate reference values to the table associated with the 'Laboratory Analytical Results for Samples collected at SNP-14' and to provide a narrative description, detailing the magnitude of any deviations between results and predictions and outlining potential causes and mitigations, if applicable." ENR acknowledges that the reference values have been provided in Table 19-31 but that there is no narrative description detailing the magnitude of any deviations between results and predictions. Given that there are 17 parameters where deviations have been highlighted, it is particularly important that DeBeers detail the significance of these deviations, as well as outline potential causes and mitigations, as applicable.</p> <p>Recommendation 1) ENR recommends that De Beers "provide a narrative description, detailing the magnitude of any deviations between results and</p>	<p>May 30: As described in response to GNWT #10, the exceedance of the water samples is due to inappropriate sampling of stagnant water, instead of active seepage flows. As a corrective action, the 2019 seepage sampling program will only focus on the active seepage / runoff, and the water ponding that collects active seepage/runoff. The description in appropriate report sections will be updated.</p>	<p>Noted.</p> <p>De Beers to update the Annual Water Licence Report as requested by the Board in the July 5, 2018 letter.</p> <p>Include this item in a conformity table to indicate where in the Annual Report this item has been addressed.</p>

		predictions and outlining potential causes and mitigations, if applicable” in Table 19-31 in order to satisfy the direction from the Board		
MVLWB: Angela Love				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	July 5, 2018 Board Acknowledgement/Direction Letter of 2017 Annual Report	Comment The Board provided direction to De Beers, in the Acknowledgement/Direction Letter dated July 5, 2018, to address comments and commitments made during the review of the 2017 Annual Report. Recommendation De Beers to confirm where in the 2018 Annual Report the Boards direction has been addressed.	May 30: During submission of Water Licence Annual Report Version 1.1, a conformance table will be included in the cover letter to confirm how the Board directions on 2017 and 2018 Annual Reports.	Noted. De Beers to update the Annual Water Licence Report as requested by the Board in the July 5, 2018 letter.
2	Plain Language Summary	Comment States the Type A Water Licence was issued September 24, 2016. Issuance was on September 24, 2014. Recommendation To update date of Issuance.	May 30: The water licence issuance date will be updated.	Noted. De Beers to update the plain language summary of the Annual Water Licence Report with the corrected information.
3	Section 1: Introduction	Comment 1) Reference is made to a Land Use Permit MV2014C0032. Recommendation To update Land Use Permit reference to MV2005C0032.	May 30: The reference to the land use permit will be updated.	Noted. De Beers to update section 1 of the Annual Water Licence Report with the corrected information.
4	N/A	Comment 2) States the Type A Water Licence was issued September 24, 2016. Issuance was on September 24, 2014. Recommendation To update date of Issuance.	May 30: The water licence issuance date will be updated.	Noted. De Beers to update section 1 of the Annual Water Licence Report with the corrected information.
5	Section 2: Engagement	Comment Table 2-1 reads as though this is a tentative schedule for activities to occur in the future, but is labeled for engagement in 2018. Recommendation De Beers to	May 30: Descriptions of Table 2-1 will be updated to conform to the Water Licence condition.	Noted. De Beers to update section 2 of the Annual Water Licence Report

	confirm if Table 2-1 describes activities that are planned for the forthcoming year (i.e. 2019) as required by Schedule 1, condition 1 a) of Licence MV2005L2-0015.		with the corrected information.
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Environmental Protection Operations Directorate
Prairie & Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

ECCC File: 5100 000 034/008
MVLWB File: MV2005C0032
MV2005L2-0015

May 22, 2019

Via online submission

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

Dear Angela Love:

RE: MV2005C0032 and MV2005L2-0015 – De Beers – Gahcho Kue – 2018 Annual Report

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above-mentioned Annual Report and is submitting comments via the online review system. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, and the pollution prevention provisions of the *Fisheries Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4743 or Russell.Wykes@Canada.ca.

Sincerely,

[original signed by]

Russell Wykes
Environmental Assessment Coordinator

Attachment(s): ECCC Comments Excel Sheet

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)



May 22, 2019

Jen Potten
Regulatory Coordinator
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Potten,

**Re: DeBeers - Gahcho Kue
Water Licence – MV2005L2-0015
2018 Annual Water Licence Report
Request for Comment**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the report at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *Species at Risk (NWT) Act*, the *Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

Topic 1: Current Project Schedule

Comment(s):

Table 4-1 outlines the Current Project schedule including construction and closure. ENR notes that in the 2017 Annual Report, progressive reclamation of the coarse processed kimberlite (CPK) pile is anticipated to begin in 2021, while the 2018 Annual Report, it begins in 2025. It isn't clear why the schedule has changed.

Recommendation(s):

- 1) ENR recommends that in future Annual Reports, De Beers identify any changes in project schedule.
- 2) ENR recommends De Beers provide rationale for delaying progressive reclamation of the CPK pile, as well as a description of any other changes to the project schedule since the 2017 Annual Report.

Topic 2: Seepage Survey Dates

Comment(s):

Section 11, page 51 states that seepage surveys were conducted June 10-15, 2018 and September 30, 2018. Page 73 states that seepage and runoff surveys were completed May 28-30, 2018 and September 10-12, 2018.

Recommendation(s):

- 1) ENR recommends that De Beers clarify the dates of the seepage surveys.

Topic 3: Seepage Sampling Locations and Protocol

Comment(s):

According to Tables 11-3 and 11-4, the majority of seepage sample locations had no visible water flow during the spring and fall surveys. The spring survey noted several locations were ice covered, and the fall survey noted several locations that were dry. The 2018 Bi-Annual Geochemical Audit, Performance Monitoring Report (Tetra Tech, 2018) in Appendix D states that 28 samples were collected in the spring event, and 23 were collected in the fall.

Section 4.2.2 of the Geochemical Audit (Tetra Tech, 2018) notes that exceedances in sample DI-01 of aluminum, cadmium, lithium, manganese, nickel, zinc, etc. "...may be due to standing water and annual evaporation, and not due to dyke seepage."

Given that the majority of samples were collected from areas where no flow was visible, and ice was present in the spring, it isn't clear that the results of this program are truly representative of waste rock geochemistry and influences on seepage and surface runoff.

Recommendation(s):

- 1) ENR recommends that De Beers clarify the goal of this geochemical sampling program. If the goal is to characterize the water quality of seepage and runoff interacting with waste rock on site, ENR recommends that samples only be collected when visible flow is present and the water can be seen to be exiting the waste rock pile/structure.
- 2) ENR recommends that De Beers consider conducting the spring seepage survey slightly later in the spring to avoid ice covered conditions at the sample locations.

Topic 4: Table 11-10 - Parameters selected from the Shake Flask Extraction (SFE) Analysis (Mine Rock)

Comment(s):

ENR compared the parameters selected for Table 11-10 in the 2018 Annual Report, to the corresponding table (Table 11-7a) in the 2017 Annual Report and noted that 3 additional parameters are listed in the 2018 Annual Report: dissolved aluminum, copper, and uranium. ENR also noted that vanadium was not included in the 2018 table although it had been included in the 2017 table.

ENR notes similar parameter changes between Table 11-12 (2018 Annual Report) and the corresponding Table 11-8a (2017 Annual Report), as well as Table 11-13 (2018 Annual Report) and corresponding Table 11-8b (2017 Annual Report).

ENR notes that there is no discussion regarding how these parameters are selected, or why the list of selected parameters could change year to year.

Recommendation(s):

- 1) ENR recommends that De Beers clarify why the selected parameters for SFE results have changed in 2018, and that selection criteria or rationale be provided for the parameters being presented in future Annual Reports.

Topic 5: Geochemical Monitoring – Shake Flask Extraction Results

Comment(s):

Section 11.2 contains a summary of the geochemical monitoring results, including results of shake flask extraction analysis compared to the input water chemistry for “Unsaturated Mine Rock – Granite (Non-PAG)” used in water quality modelling. De Beers notes a number of analyzed parameters that exceed the steady state and first flush values, with other parameters exceeding the steady state, but below first flush values for both mine rock and kimberlite samples. However, neither this section nor Appendix D contain any interpretation or discussion of the significance of the concentrations that exceed the input water chemistry values.

Recommendation(s):

- 1) ENR recommends that De Beers include interpretation of results in all future Annual Reports as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.ii).

Topic 6: Appendix D - Geochemical Audit – NP Determination Methodologies

Comment(s):

It isn't clear why the Modified Sobek method was used for analysis of the spring audit samples, and the Standard Sobek method was used in analysis for the fall audit samples.

Recommendation(s):

- 1) ENR recommends that De Beers provide rationale for using two different NP determination methodologies during the 2018 bi-annual geochemical audit.
- 2) ENR recommends that De Beers clarify which method will be used for future geochemical audits, and provide justification for selecting that method.

Topic 7: Table 11-16 Management Responses

Comment(s):

ENR notes that not all management responses in Table 11-16 address the action level exceedances as laid out in the Geochemical Characterization and Management Plan.

For example, a number of seepage samples exceeded multiple action levels; however, none of the management responses such as: review pH test procedure, collect and analyze follow up confirmation sample, increase frequency of monitoring, investigate alternative mitigation strategies, etc. are included.

ENR notes that it isn't clear how the various management responses are categorized in terms of low, medium, high action level exceedances. It would be helpful to clarify this in the Annual Water Licence Reports as well as the Geochemical Characterization Management Plan.

Recommendation(s):

- 1) ENR recommends that De Beers clarify management responses taken to address the seepage action level exceedances.
- 2) ENR recommends that the level of management response (low, medium, high) being applied is included in Table 11-16.

Topic 8: Spring and Fall Seepage Sample Metal Exceedances

Comment(s):

Sections 4.2.2 and 4.2.4 of Appendix D notes a number of seepage sample exceedances relative to water chemistry source term predictions – steady state and first flush - during both the spring and fall surveys. ENR notes that the document does not provide any discussion or interpretation of the significance of the exceedances.

Recommendation(s):

- 1) ENR recommends that in future Annual Reports, a discussion of results should be provided detailing the significance of any deviations from source term predictions, potential causes of any exceedances, and mitigation measures to be implemented, if applicable.
- 2) ENR recommends that, given the number of parameter concentrations that exceeded the input water chemistry values, De Beers consider establishing action levels and associated management responses for metal leaching in the Geochemical Characterization and Management Plan. This will support adaptive management during operations, and help inform closure and post closure monitoring.

Topic 9: Seepage Trend Analysis

Comment(s):

De Beers states in Section 11.3 of the 2018 Annual Report that trend analysis of seepage and runoff survey data was conducted by completing Mann-Kendall tests, and that the full suite of trends are included in Appendix D, but they do not appear to have been included.

Recommendation(s):

- 1) ENR recommends that De Beers provide an overview analysis of major trends as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iii).

Topic 10: Interpretation of the Results of all Survey Data Collected since Project Inception

Comment(s):

ENR notes that the 2018 Annual Report, as well as Appendix D are focused on the 2018 data, and do not provide an interpretation of the results of all survey data collected since project inception as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iv).

Recommendation(s):

- 1) ENR recommends that De Beers provide an interpretation of results of all survey data collected since project inception as specified in the Water Licence (Schedule 1, Part B, Item 10, 1.j.iv).

Topic 11: SNP-06

Comment(s):

Based on GNWT-ENR comment ID-4 made during the review of the 2017 Annual Report, the Board directed De Beers to “include a narrative description and interpretation of parameters of concern, detailing influences that can be attributed from the Fine PKC Facility on the Water Management Pond” in future iterations of the Annual Report, starting with the March 31, 2019.

ENR notes that the 2018 Annual Report does not contain such a description.

Recommendation(s):

- 1) ENR recommends that De Beers provide the “description and interpretation of parameters of concern, detailing influences that can be attributed from the Fine PKC Facility on the Water Management Pond” in order to satisfy the direction from the Board.

Topic 12: SNP-07 Fecal Coliform Exceedance

Comment(s):

The fecal coliform count in the October 2nd sample was 61 MPN/100mL, which exceeded the effluent quality criteria (EQC) of 20 MPN/100mL. Given that the membrane bioreactors weren't investigated until October 16, the effluent was potentially out of compliance for up to two weeks.

ENR notes that the 2018 Annual Report does not discuss any additional investigations or confirmatory sampling in Area 7 or the Water Management Pond (WMP) to investigate whether untreated effluent impacted Area 7 or the WMP.

Recommendation(s):

- 1) ENR recommends that if future exceedances occur, De Beers sample the effluent storage location to ensure that the effluent in those locations does not exceed the SNP-07 fecal coliform EQC.
- 2) ENR recommends that future Annual Reports include a summary of corrective actions that have been put in place to ensure such issues are prevented going forward.

Topic 13: Seepage from South Mine Rock Pile-Board Direction

Comment(s):

In response to GNWT-ENR comment ID-6 on the 2017 Annual Report, the Board directed De Beers “to include appropriate reference values to the table associated with the ‘Laboratory Analytical Results for Samples collected at SNP-12’ and to provide a narrative description, detailing the magnitude of any deviations between results and predictions and outlining potential causes and mitigations, if applicable.” ENR notes that the reference values have not been provided in Table 19-29 (results from SNP-12).

Recommendation(s):

- 1) ENR recommends that De Beers provide the reference values associated with Table 19-29 in order to satisfy the direction from the Board.

Topic 14: Seepage from Coarse Processed Kimberlite Pile

Comment(s):

In response to GNWT-ENR comment ID-7 on the 2017 Annual Report, the Board directed De Beers “to include appropriate reference values to the table associated with the ‘Laboratory Analytical Results for Samples collected at SNP-14’ and to provide a narrative description, detailing the magnitude of any deviations between results and predictions and outlining potential causes and mitigations, if applicable.” ENR acknowledges that the reference values have been provided in Table 19-31 but that there is no narrative description detailing the magnitude of any deviations between results and predictions. Given that there are 17 parameters where deviations have been highlighted, it is particularly important that DeBeers detail the

significance of these deviations, as well as outline potential causes and mitigations, as applicable.

Recommendation(s):

- 1) ENR recommends that De Beers “provide a narrative description, detailing the magnitude of any deviations between results and predictions and outlining potential causes and mitigations, if applicable” in Table 19-31 in order to satisfy the direction from the Board

Comments and recommendations were provided by ENR technical experts in the Water Management and Monitoring Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Environmental Stewardship and Climate Change Division.

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.

Sincerely,



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