



Mackenzie Valley Land and Water Board
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Staff Report

Applicant: De Beers Canada Inc. - Gahcho Kué Project	
Location: Kennady Lake, NT	Application: MV2005C0032 and MV2005L2-0015
Date Prepared: December 20, 2017	Meeting Date: January 11, 2018
Subject: Waste Management Plan Version 5.3	

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) for decision De Beers Canada Inc.'s (De Beers) Waste Management Plan Version 5.3 (Plan), as submitted under Land Use Permit (Permit) MV2005C0032 and Water Licence (Licence) MV2005L2-0015 for the Gahcho Kué Project.

2. Background

- November 20, 2017 – De Beers submits the Plan;
- November 24, 2017 – Board staff review the Plan for consistency and request further changes. De Beers submits an updated Plan and review commenced;
- December 12, 2017 – Review comments and recommendations due and received;
- December 20, 2017 – Responses received; and
- **January 11, 2018 – Plan presented to the Board for decision.**

3. Discussion

Background

Part G, item 2 of Licence MV2005L2-0015 and condition 47 of Permit MV2005C0032 require the submission of a Waste Management Plan. Revisions to reflect any changes in operations, or as directed by the Board, are required under Part G, item 18 of Licence MV2005L2-0015 and condition 48 of Permit MV2005C0032. Revisions are to be submitted to the Board for approval at least 60 days prior to any proposed changes to the requirements in the approved Plan. The Board approved the previous version of the Plan (Version 5.2) on September 28, 2017.

Requested Change

On November 24, 2017, De Beers submitted an updated Plan (Version 5.3) which included:

- A Compost Management Plan which describes the storage, handling, and disposal of compost material at site in detail; and
- Updates as directed by the MVLWB in the approval of Version 5.2 ([September 28, 2017 decision letter](#)):

- Definition of inert wastes;
- Use of incinerator ash vs. non-toxic incinerator ash;
- Definition of the term sewage liquor;
- WMP to be defined as the Water Management Pond; and
- GPS coordinates.

4. Comments

Not applicable.

5. Reviewer Comments

By December 12, 2017, comments and recommendations on the Plan were received from 3 reviewers:

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

De Beers responded on December 20, 2017. The Review Summary and Attachments (attached) presents the concerns identified through the review of the Plan.

During the review, the GNWT asked De Beers if sewage sludge has ever been incinerated since mining operations began, and where these occurrences would be reported (GNWT-ENR comment ID-2). De Beers answered stating that this information would be reported in the annual water and land use report. Board staff note that De Beers could confirm, as requested by the GNWT, if the incineration of sewage sludge has ever occurred and if so, provide further details on the location of where this can be found in the annual report.

In addition, the GNWT-ENR requested detailed information and background on the use and effectiveness of bioremediation techniques for glycols-impacted soils (GNWT-ENR comment ID-3). De Beers responded that a summary of activities conducted in accordance with the approved Waste Management Plan, including landfarming of hydrocarbon/glycol contaminated soils, will be reported in the annual water licence and land use permit report. Board staff note that De Beers could, as requested by the GNWT, provide them with detailed information and background on the use and effectiveness of bioremediation techniques for glycols-impacted soils, or at a minimum reference where in the annual reports this information can be found.

6. Security

The GNWT currently holds reclamation security in the amounts of \$23,776,270.00 under Licence MV2005L2-0015 and \$13,817,863.00 under Permit MV2005C0032 for the Gahcho Kué project (attached). De Beers' next deposit of security (in the amount of \$40,713,234.00 under Licence MV2005L2-0015 and \$1,382,934.00 under Permit MV2005C0032) is due prior to year 4 of Operations (the end of mining of the Hearne Pit).

No changes to the security are proposed.

7. Conclusion

Board staff conclude that the updated Plan (Version 5.3) includes information related to the requirements set out in the Board's *Guidelines for Developing a Waste Management Plan*, and addresses the requests outlined in the Boards September 28, 2017 Decision letter.

8. Recommendation

Board staff recommend the Board approve the Waste Management Plan (Version 5.3) as submitted.

Board staff recommend the Board direct De Beers to provide the following clarification to the Board by **January 25, 2018**:

Comment ID	Clarification for De Beers to provide to the Board
GNWT-ENR 2	De Beers to confirm if the incineration of sewage sludge has ever occurred, and if so, provide further details on the location of where this can be found in the annual report.
GNWT-ENR 3	De Beers to provide the GNWT with detailed information and background on the use and effectiveness of bioremediation techniques for glycols-impacted soils, or at a minimum, reference where in the annual reports this information can be found.

Board staff further recommend that the Board require De Beers to update the Waste Management Plan in the next revision with information identified in the reviewer comment summary table and as summarized below:

Reviewer Comment Number	Recommendation	Update to be made
GNWT-ENR 4	ENR recommends that WMP information, regarding Waste Oil management [re: off-site shipment or on-site recycling], be clarified. For any on-site re-use of waste oil, further procedural descriptive details and justification is to be provided.	De Beers to update the Waste Management Plan to ensure consistency throughout regarding the management of waste oil and to include procedural descriptive details and justification for any on-site re-use of waste oil (can use the description in their response) in the next revision.
Board staff 3	Include the location of where the illustration of the process for Phase 1 can be found.	De Beers to update Appendix H of the Waste Management Plan with the missing reference in the next revision.
Board staff 4	Clarification of process on the handling/management of Non-biodegradable food-contaminated waste (i.e. plastics) is required.	De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the handling/management of Non-biodegradable food-contaminated waste (i.e. plastics) (can use the description in their response) in the next revision.
Board staff 6	Clarification on the process of the outputs is required.	De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the process of the outputs (can use the description in their response) in the next revision.
Board staff 7	Include the location of where this pathway illustration can be found.	De Beers to update Appendix H of the Waste Management Plan with the missing reference in the next revision.

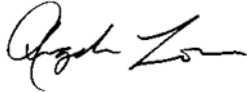
Board staff 8	Incineration is described in Section 4.4: Outputs. Clarification is required on process as the Plan is not consistent on this topic (if composted material would still be incinerated or landfilled and what are the triggers for choosing each pathway).	De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the process of the outputs (can use the description in their response) in the next revision.
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A draft decision letter is provided for the Board’s consideration.

9. Attachments

- [Waste Management Plan Version 5.3](#)
- Review Summary and Attachments
- Draft Decision Letter from the Board

Respectfully submitted,



Angela Love
Regulatory Specialist

Review Comment Table

Board:	MVLWB
Review Item:	De Beers Gahcho Kue - Waste Management Plan (Version 5.3) (MV2005C0032 and MV2005L2-0015)
File(s):	MV2005C0032 MV2005L2-0015
Proponent:	De Beers Canada Inc - Gahcho Kue
Document(s):	Waste Management Plan - Version 5.3 (26240 KB)
Item For Review Distributed On:	Nov 24 at 12:06 Distribution List
Reviewer Comments Due By:	Dec 12, 2017
Proponent Responses Due By:	Dec 20, 2017
Item Description:	<p>De Beers Canada Inc. (De Beers) has submitted Version 5.3 of its Waste Management Plan (Plan), for Board approval, on November 24, 2017. The Plan is required by Part G, item 2 of Licence MV2005L2-0015 and condition 47 of Permit MV2005C0032.</p> <p>PROPOSED CHANGES TO THE PLAN</p> <ul style="list-style-type: none"> • A Compost Management Plan has been included, as Appendix H, and describes the storage, handling, and disposal of compost material at site in detail (also addition/modification to sections 2.1.2, 2.1.3, and 5.3, table 2, and figure 3) • Updates as directed by the MVLWB in the approval of Version 5.2 (September 28, 2017 decision letter). <ul style="list-style-type: none"> ○ Definition of inert wastes (section 2.1.2 under subheading 'operation and construction waste') ○ Use of incinerator ash vs. non-toxic incinerator ash (section 3.4.1) ○ Definition of the term sewage liquor (section 2.1.2) ○ WMP is defined as Water Management Pond (sections 2.1.2 and 8.1) ○ GPS coordinates added (sections 3.1 and 3.4.1) <p>Reviewers are invited to submit questions, comments, and recommendations on this submission using the Online Review System (ORS) by the review comment deadline specified below.</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>Fort Resolution Métis Council - Trudy King (867) 394-3322 Hay River Metis Council - Trevor Beck, President (867) 874-4472 NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator (867) 872-3586</p>

Contact Information:

Angela Love 867-766-7456
 Jen Potten 867-766-7468
 Kierney Leach 867-766-7470

Comment Summary

Environment and Climate Change Canada: Melissa Pinto				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	General	Comment ECCC has reviewed the De Beers Gahcho Kue Waste Management Plan Version 5.3 according to its mandate and has no comments at this time. Recommendation N/A	Dec 20: acknowledged	Noted.
GNWT - ENR: Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
5	General File	Comment (doc) ENR Letter with Comments and Recommendations Recommendation		Noted.
1	Topic 1: Waste Management Plan Updates - Revision History	Comment The Waste Management Plan (WMP) package circulated contained 399 pages. The WMP itself was 74 pages. Attached to the WMP were also: <ul style="list-style-type: none"> • Gahcho Kue Incinerator Management Plan (p. 76-104); • Gahcho Kue Mine Solid Waste Interim Landfill Operations Plan (p. 105-126); • Gahcho Kue Landfarm Management and Final Detailed Construction Plan (p. 127-175); • Gahcho Kué Mine Master Geotechnical Specifications for Fill Materials and Geotextile/Geomembrane Supply and Installation (p. 176-238); • Gahcho Kué Mine Quality Assurance Plan for Landfarm Construction - Version 1 (p. 	Dec 20: A version history table was included with the updated Waste Management Plan. The history includes all changes made within the document, including any changes to any appendices.	Appropriate response. De Beers provided a description of changes made in the Waste Management Plan (V 5.3) in the Revision History table that included the sections. De Beers is encouraged to continue identifying all revisions in the Revision History table of each plan.

		<p>239-291) and MSDS sheets (p. 292-399).</p> <p>ENR's comments/recommendations were prepared for the new WMP Version 5.3 only, with occasional references to other attached plans. In order to easily identify and track with time changes made, the "Revision History" should specify each change made to a plan (even least significant), along with associated page(s) in the document where changes were made. This Table should include items added, amended and/or removed.</p> <p>Recommendation 1) ENR recommends that all Gahcho Kué Management Plans "Revision History" present all changes made, along with the associated pages(s) indicating each change made.</p>		
2	Topic 2: Sewage Sludge Incineration Practices	<p>Comment Gahcho Kué Incineration Management Plan (IMP, V3) was attached to the WMP currently for review. Table 1 of the IMP included Public Hearing Transcript excerpt (p. 85 of 399) stating "In the Incinerator Management Plan, the concern was raised by Environment Canada that we shouldn't burn our sewage or sewage sludge. We've agreed that we will not do that. We will store it in our landfill, which is typical - typical of what Snap Lake is doing. And that, yes, again I'll make the - say it again, that we will conduct stack testing for Canada-wide standards for dioxins, furans, and mercury." This was also specified in Gahcho Kué Updated Commitment List, with "De Beers supports the recommendation to not incinerate sewage or sewage sludge in the revised IMP (p. 84 of 399)", and with "De Beers will incorporate mitigation that will be integrated into the operations phase of the Mine to minimize dioxins, furans, and mercury emissions. These will include, but are not limited to, the</p>	<p>Dec 20: There were no adjustments made to the Incinerator Management Plan and no changes made to the processing of sewage sludge. These aspects of the Waste Management Plan have already been approved and are not open for review at this time. For clarity however, the incineration of sewage sludge will only occur within upset conditions at the Sewage Treatment Plant. If incineration of sewage sludge does ever occur, it would be reported in the annual water and land use report.</p>	<p>The Waste Management Plan (Version 5.2) is an approved document. Should revisions to the document be required, as per Condition 48 of Permit MV2005C0032 or Part G, item 18 of Licence MV2005L2-0015, it is to be submitted to the Board for approval. Although updates are limited to certain sections of the document, and those sections are highlighted for reviewers, the review is not limited.</p> <p>De Beers' statement that they do not plan on incinerating sewage sludge, unless there is an emergency with the sewage treatment plant, has</p>

		<p>following: Landfilling sewage sludge - sewage sludge will not be incinerated." (Section 4.1 - Mitigation and Waste Reduction (IMP))." Section 2.1.2 and 3.1.2 of the current WMP Version 5.3 however, specifies that Sewage Treatment Plant emergencies may require on-site incineration of sewage sludge to occur. Have such sewage sludge (and/or sewage) emergency incinerations occurred since the beginning of Gahcho Kue's mining operations, and at what frequency, if any? Which mechanisms are, or were, planned/used to report these occurrences to the MVLWB?</p> <p>Recommendation 1) ENR recommends the WMP align with De Beers commitments to not incinerate sewage sludge as outlined during the Gahcho Kue Public Hearing, and as specified in Version 3 of the Gahcho Kue Incineration Management Plan.</p>		<p>been included in the Waste Management Plan since Version 2 was submitted to the MVLWB.</p> <p>De Beers could confirm, as requested by the GNWT, if the incineration of sewage sludge has ever occurred and if so, provide further details on the location of where this can be found in the annual report.</p>
3	Topic 3: Glycol-impacted Contaminated Soils	<p>Comment Both Table 1 and Section 2.2.2.2 of the WMP, under Contaminated soil, specify that lightly contaminated soil with no hydrocarbon free product and/or glycols spills or leaks will be excavated and transported for remediation at the landfarm. These waste management practices are specified not only for hydrocarbons-impacted soil - but also glycols impacted soil (see also section 2.2.3). While bioremediation treatment has been used with success for treatment of hydrocarbon-impacted soils, ENR would like to request further background on treatment and effectiveness of glycol-impacted soils treated at a landfarm.</p> <p>Recommendation 1) ENR recommends De Beers provide detailed information and background on the use and</p>	<p>Dec 20: There were no adjustments made to the Landfarm Management Plan or processing of hydrocarbon/glycol contaminated soils in this updated version of the Waste Management Plan. These aspects of the Waste Management Plan have already been approved and are not open for review at this time. However, for clarity, a summary of activities conducted in accordance with the approved Waste Management Plan, including landfarming of hydrocarbon/glycol contaminated soils, will be reported in the annual water licence and land use permit report.</p>	<p>The Waste Management Plan (Version 5.2) is an approved document. Should revisions to the document be required, as per Condition 48 of Permit MV2005C0032 or Part G, item 18 of Licence MV2005L2-0015, it is to be submitted to the Board for approval. Although updates are limited to certain sections of the document, and those sections are highlighted for reviewers, the review is not limited.</p> <p>De Beers could, as requested by the</p>

		effectiveness of bioremediation techniques for glycols-impacted soils.		GNWT, provide them with detailed information and background on the use and effectiveness of bioremediation techniques for glycols-impacted soils, or at a minimum reference where in the annual reports this information can be found.
4	Topic 4: Waste Oils - Shipped Off-site or Managed On-site	<p>Comment Table 5 of the WMP (p. 43 of 399) indicates an estimated 60,000,000 L Peak Volumes of Petroleum, Oils and Lubricants that are stored, or managed, at the mine site. Off-site shipment of waste oils (and associated used oil filters and used absorbent materials) is stated as the only management option provided within Table 4 "Hazardous Waste Management." Section 3.1.2 of the current WMP however, specifies that waste oil may be used on-site as a fuel source for the incinerator and glycol burners, following specifications provided by each model's manufacturer. The "Flow Diagram on Waste Streams Management" (Figure 3) also depicts waste oil to be re-used as fuel source (p. 26 of 399), and p. 14 specifies that De Beers will comply with NWT Used and Waste Oil regulations of the WMP "If waste oil is to be recycled for this use" [where evaluation and testing data for various constituents would occur]."</p> <p>Recommendation 1) ENR recommends that WMP information, regarding Waste Oil management [re: off-site shipment or on-site recycling], be clarified. For any on-site re-use of waste oil, further procedural descriptive details and justification is to be provided.</p>	<p>Dec 20: There were no adjustments made to the processing of waste oil in this version of the Waste Management Plan. These aspects of the Waste Management Plan have already been approved and are not open for review at this time. However, for clarity, waste oil destined to be re-used as heating oil on site is regulated under the Used Oil and Waste Fuel Management Regulations. As per the Regulations, a sample from the site feedstock is annually sent to laboratory for analysis of analytes defined in Schedule A. Results of this analysis are submitted to GNWT-ENR. Once verified as compliant by GNWT-ENR, the feedstock is deemed acceptable for on site use as waste fuel.</p>	<p>The Waste Management Plan (Version 5.2) is an approved document. Should revisions to the document be required, as per Condition 48 of Permit MV2005C0032 or Part G, item 18 of Licence MV2005L2-0015, it is to be submitted to the Board for approval. Although updates are limited to certain sections of the document, and those sections are highlighted for reviewers, the review is not limited.</p> <p>De Beers to update the Waste Management Plan to ensure consistency throughout regarding the management of waste oil and to include procedural descriptive details and justification for any on-site re-use of waste oil (can use the description in their</p>

				response) in the next revision.
MVLWB: Angela Love				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
1	Appendix H, Section 2: Regulatory Guidelines	<p>Comment Plan states that ‘Leachate will continue to be collected in a sump at the landfill and water collected there will be discharged to the Water Management Pond following freshet or major rainfall events.’ No references were made to what the leachate will be tested for, if anything, prior to being discharged to the Water Management Pond.</p> <p>Recommendation Please provide further information on what, if any, parameters will be tested.</p>	<p>Dec 20: Leachate collected within landfills will be tested for TCLP leachable BTEX (benzene, toluene, ethylbenzene, xylene) and TCLP Leachable metals.</p>	The response answers the questions.
2	Appendix H, Section 2.2: Foreign Matter	<p>Comment The Plan outlines two phases that will be implemented; Phase 1 is to introduce the composting system at the mine site; and Phase 2 will include more involvement in sorting the waste streams prior to loading into the composter and screening the output to remove any large foreign objects. There is no mention of when Phase 2 would be implemented.</p> <p>Recommendation What is the proposed timeline that would see Phase 2 being implemented?</p>	<p>Dec 20: The timeframe for moving into phase 2 is not strictly defined. The primary benefit to composting rather than incinerating most food-contaminated waste, comes from a reduction in the use of incinerators and corresponding reduction in the consumption of diesel fuel. The secondary benefit will come during phase 2 when the output of the composting process may be used in reclamation research. It is possible that Phase 2 will be an intermittent phase which is turned on and off as output material is required for reclamation research. For example, if a research trial requires composted material, site may enter into a period of more intensive sorting of waste in an attempt to create output material that is sufficiently free of foreign objects for use on the</p>	The response answers the questions.

			land. Following production of the required quantity of usable soil, site may move back into a phase 1 level of sorting.	
3	Appendix H, Section 4.0: Operations	<p>Comment Location of illustration of the process for Phase 1 is not included.</p> <p>Recommendation Include the location of where this illustration can be found.</p>	<p>Dec 20: The reference to the figure was absent in the document. This will be corrected. Figure 4 illustrates the pathways of food-contaminated waste handling, storage, and disposal in Phase 1.</p>	<p>Appropriate response.</p> <p>De Beers to update Appendix H of the Waste Management Plan with the missing reference in the next revision.</p>
4	Appendix H, Section 4.1: Phase 1	<p>Comment The Plan lists out the waste to be diverted to the composting system to include Non-biodegradable food-contaminated waste (i.e. plastics). In a paragraph above the list, it states that 'The food-contaminated plastics will be transported to the incinerator in clear plastic bags'.</p> <p>Recommendation Clarification of process on the handling/management of Non-biodegradable food-contaminated waste (i.e. plastics) is required.</p>	<p>Dec 20: Under approved Version 5.2 of the Waste Management Plan, all food-contaminated waste, including plastics, are incinerated. Under the proposed Version 5.3 of the Waste Management Plan, most food-contaminated waste will be composted and then landfilled. Only a minor portion of the food-contaminated waste stream will be incinerated. That portion will include the plastics. It is anticipated that some food-contaminated plastics will also be composted and landfilled as it will not be possible to sort-out all food-contaminated plastics from the composter waste stream.</p>	<p>Appropriate response.</p> <p>De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the handling/management of Non-biodegradable food-contaminated waste (i.e. plastics) (can use the description in their response) in the next revision.</p>
5	Appendix H, Section 4.2: Phase 2	<p>Comment The Plan notes that 'It is anticipated that Phase 2 will result in an increase in the amount of use of the incinerator.'. In Section 4.4: Outputs, it states that 'Composting the material rather than incinerating, still provides a significant environmental benefit by reducing the emissions associated with incineration as well as the volume of diesel fuel used in the disposal of food waste.' and in the attached letter submitted with the Plan, it states that 'We expect that composting much of the food-contaminated waste produced by the mine will reduce the volume of</p>	<p>Dec 20: Because there will an extra level of sorting in Phase 2, we anticipate that more plastics will be removed from the waste stream destined for the composter. These plastics will be incinerated, exactly as currently approved in V5.2 of the Waste Management Plan. Because slightly more plastics will be diverted away from composting, and toward incinerating in Phase 2 as compared to Phase 1, we anticipate slightly higher use of the incinerator in Phase 2 as compared to Phase 1. However,</p>	<p>The response has answered the question.</p>

		<p>diesel fuel consumed annually and reduce the emissions emitted to the atmosphere as the incinerators are used less frequently.'</p> <p>Recommendation Confirm if the incinerator will be utilized more frequently or not as the Plan is not consistent on this.</p>	<p>it is worth noting that we will continue to compost the vast majority of food waste and therefore the use of the incinerators will continue to be far less than under V5.2 of the Waste Management Plan when all food-contaminated waste was incinerated.</p>	
6	Appendix H, Section 4.4: Outputs	<p>Comment The Plan states that 'During composter upset conditions, all waste will be incinerated until recovery is verified.' Other areas of the Plan state that all output will be landfilled.</p> <p>Recommendation Clarification on the process of the outputs is required.</p>	<p>Dec 20: When the composter is not functioning, it is expected that all food waste will be incinerated (as in V5.2 of the Waste Management Plan). If composting during phase 2 does not result in the production of usable soil output material, the output material will be landfilled (as in Phase 1).</p>	<p>Appropriate response.</p> <p>De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the process of the outputs (can use the description in their response) in the next revision.</p>
7	Appendix H, Section 4.4.1: Disposal in the Landfill	<p>Comment Location of illustration of the pathway is not included.</p> <p>Recommendation Include the location of where this illustration can be found.</p>	<p>Dec 20: The reference to the figure was absent in the document. This will be corrected. Figure 5 illustrates the pathways of food-contaminated waste, cardboard, paper, and wood handling, storage, and disposal phase 2.</p>	<p>Appropriate response.</p> <p>De Beers to update Appendix H of the Waste Management Plan with the missing reference in the next revision.</p>

8	Appendix H, Section 4.4.2: Use in reclamation	<p>Comment The Plan states that 'If it cannot, it will be placed in the landfill or incinerated as described in Section 4.4.1.'</p> <p>Recommendation Incineration is described in Section 4.4: Outputs. Clarification is required on process as the Plan is not consistent on this topic (if composted material would still be incinerated or landfilled and what are the triggers for choosing each pathway).</p>	<p>Dec 20: Composted output material will not be incinerated. Material that goes through the composter will either be landfilled or used in reclamation as described on Figures 4 and 5. During phase 1, all composted material will be placed in the landfill. During Phase 2 there are two potential pathways for composted material. a) Composted material will be used in reclamation efforts if it meets the CCME guidelines b) Composted material will be placed in the landfill if it does not meet the CCME guidelines. Testing of composted material against the CCME guidelines will only occur in phase 2 when material is intended for use.</p>	<p>Appropriate response.</p> <p>De Beers to update Appendix H of the Waste Management Plan to ensure consistency throughout regarding the process of the outputs (can use the description in their response) in the next revision.</p>
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December 12, 2017

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

Dear Ms. Leach,

**Re: DeBeers - Gahcho Kue
Water Licence - MV2005L2-0015
Waste Management Plan - Version 5.3
Request for Comment**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the document 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: Waste Management Plan Updates – Revision History

Comment(s):

The Waste Management Plan (WMP) package circulated contained 399 pages. The WMP itself was 74 pages. Attached to the WMP were also:

- Gahcho Kue Incinerator Management Plan (p. 76-104);
- Gahcho Kue Mine Solid Waste Interim Landfill Operations Plan (p. 105-126);
- Gahcho Kue Landfarm Management and Final Detailed Construction Plan (p. 127-175);
- Gahcho Kué Mine Master Geotechnical Specifications for Fill Materials and Geotextile/Geomembrane Supply and Installation (p. 176-238);
- Gahcho Kué Mine Quality Assurance Plan for Landfarm Construction –

Version 1 (p. 239-291) and MSDS sheets (p. 292-399).

ENR's comments/recommendations were prepared for the new WMP Version 5.3 only, with occasional references to other attached plans.

In order to easily identify and track with time changes made, the "Revision History" should specify each change made to a plan (even least significant), along with associated page(s) in the document where changes were made. This Table should include items added, amended and/or removed.

Recommendation(s):

- 1) ENR recommends that all Gahcho Kué Management Plans "Revision History" present all changes made, along with the associated pages(s) indicating each change made.

Topic 2: Sewage Sludge Incineration Practices

Comment(s):

Gahcho Kué Incineration Management Plan (IMP, V3) was attached to the WMP currently for review. Table 1 of the IMP included Public Hearing Transcript excerpt (p. 85 of 399) stating "In the Incinerator Management Plan, the concern was raised by Environment Canada that we shouldn't burn our sewage or sewage sludge. We've agreed that we will not do that. We will store it in our landfill, which is typical – typical of what Snap Lake is doing. And that, yes, again I'll make the – say it again, that we will conduct stack testing for Canada-wide standards for dioxins, furans, and mercury." This was also specified in Gahcho Kué Updated Commitment List, with "De Beers supports the recommendation to not incinerate sewage or sewage sludge in the revised IMP (p. 84 of 399)", and with "De Beers will incorporate mitigation that will be integrated into the operations phase of the Mine to minimize dioxins, furans, and mercury emissions. These will include, but are not limited to, the following: Landfilling sewage sludge - sewage sludge will not be incinerated." (Section 4.1 – Mitigation and Waste Reduction (IMP))." Section 2.1.2 and 3.1.2 of the current WMP Version 5.3 however, specifies that Sewage Treatment Plant emergencies may require on-site incineration of sewage sludge to occur.

Have such sewage sludge (and/or sewage) emergency incinerations occurred since the beginning of Gahcho Kue's mining operations, and at what frequency, if any? Which mechanisms are, or were, planned/used to report these occurrences to the MVLWB?

Recommendation(s):

- 1) ENR recommends the WMP align with De Beers commitments to not incinerate sewage sludge as outlined during the Gahcho Kue Public Hearing, and as specified in Version 3 of the Gahcho Kue Incineration Management Plan.

Topic 3: Glycol-impacted Contaminated Soils

Comment(s):

Both Table 1 and Section 2.2.2.2 of the WMP, under Contaminated soil, specify that lightly contaminated soil with no hydrocarbon free product and/or glycols spills or leaks will be excavated and transported for remediation at the landfarm. These waste management practices are specified not only for hydrocarbons-impacted soil – but also glycols impacted soil (see also section 2.2.3).

While bioremediation treatment has been used with success for treatment of hydrocarbon-impacted soils, ENR would like to request further background on treatment and effectiveness of glycol-impacted soils treated at a landfarm.

Recommendation(s):

- 1) ENR recommends De Beers provide detailed information and background on the use and effectiveness of bioremediation techniques for glycols-impacted soils.

Topic 4: Waste Oils – Shipped Off-site or Managed On-site

Comment(s):

Table 5 of the WMP (p. 43 of 399) indicates an estimated 60,000,000 L *Peak Volumes of Petroleum, Oils and Lubricants* that are stored, or managed, at the mine site. Off-site shipment of waste oils (and associated used oil filters and used absorbent materials) is stated as the only management option provided within Table 4 “Hazardous Waste Management.”

Section 3.1.2 of the current WMP however, specifies that waste oil may be used on-site as a fuel source for the incinerator and glycol burners, following specifications provided by each model’s manufacturer. The “Flow Diagram on Waste Streams Management” (Figure 3) also depicts waste oil to be re-used as fuel source (p. 26 of 399), and p. 14 specifies that De Beers will comply with NWT Used and Waste Oil regulations of the WMP “If waste oil is to be recycled for this use” [where evaluation and testing data for various constituents would occur].”

Recommendation(s):

- 1) ENR recommends that WMP information, regarding Waste Oil management [re: off-site shipment or on-site recycling], be clarified. For any on-site re-use of waste oil, further procedural descriptive details and justification is to be provided.

Comments and recommendations were provided by ENR technical experts in the Water Resources Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Conservation, Assessment and Monitoring Division (CAM).

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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