

# DE BEERS

GROUP OF COMPANIES

## Gahcho Kué Mine Rock Workshop

December 12, 201 Attendance

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Rick Walbourne	GNWT-ENR	Rick-Walbourne@gov.nt.ca
Paul Green	"	Paul-Green@gov.nt.ca
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# Agenda

## Additional Mine Rock Workshop Gahcho Kué Mine

Conference Line: 1-888-322-4689/ Participant Code: 96520843  
Tree of Peace Boardroom, 5011-51<sup>st</sup> St. Yellowknife, NT  
December 13, 2017

Time	Item	Presenter
8:30	Coffee and Greetings	
8:45	Welcome and Introductions	All
9:00	Updated Project Description 2018	De Beers
<b>10:00</b>	<b>Break</b>	
10:30	Mine Rock Pile Design	De Beers/EBA
11:30	Wildlife and Vegetation	De Beers/Golder
<b>12:00</b>	<b>Lunch</b>	
1:00	Water Quantity and Quality	De Beers/EBA/Golder
2:00	Air Quality/Fish Compensation	De Beers/Golder
<b>2:30</b>	<b>Break</b>	
3:00	General Environmental	All
3:45	Regulatory Process	De Beers/MVLWB
4:15	Adjourn	

\*lunch will not be served in the room; pdf will be distributed to participants not present. Please contact [Sarah.McLean@debeersgroup.com](mailto:Sarah.McLean@debeersgroup.com) to discuss participation.

Topic	Question/Comment	DBC Response
Mine Rock Workshop, December 13 <sup>th</sup> , 2017		
Reg (ECCC)	Do the fractures in the rock extend to the bottom of the pit? If so, do you expect additional inflow volumes as a result?	There are natural joints or fractures throughout the rock. That is not the problem. The problem is a certain set of those joints which intersects the pit at a difficult angle. If the angle of this joint set was much steeper, or much less steep, we may not have an issue at all. This particular joint set is not hydro-geologically active. There is no sign of any additional flow associated with the joint set and we do not anticipate significant changes to the inflows to the pits.
Tim Heron (NWTMN)	Does the Air Quality Model account for the puff of emissions at start-up of engines? Idling exhaust is different from running exhaust and from start-up. Does your AQ model account for that?	The Air Quality CALPUFF model is very conservative and takes into consideration the total operating hours, including operational activity, of the entire fleet. The changes in emission rates for equipment such as dozers and haul trucks, between start-up, idling, and running at various levels of driving effort (e.g., uphill and downhill operation) are addressed by a conservative approach to the emissions rates equations that are used as inputs to the model.
Nicole Goodman (NSMA)	Why does TSP max annual and dust deposition reduce more markedly than other parameters in 2018 compared to 2012?	<p>This has to do with the difference in the proximity of where the maximum annual modelled TSP and dust deposition occurs relative to the mine activity and the mine footprint. In 2012, the highest concentration of activity and emissions occurred around the South Mine Rock Pile and haul road between it and the 5034/Hearne pits. That area is fairly close to the southern edge of the mine footprint. For the WL amendment, the bulk of the activities associated are at the West Mine Rock Pile and haul route from 5034 pit, which is more concentrated within the center of the mine footprint. As a consequence, maximum annual modelled TSP and dust deposition at the nearest edge of the mine footprint are lower than modelled in 2012.</p> <p>It is also worth noting that the Air Quality model treats the large particles (TSP and dust deposition) differently than the small particles (PM<sub>2.5</sub>, NO<sub>2</sub>). The model accounts for the fact that they are heavy and settle to the ground within a short distance from their point of emission/generation.</p>

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Dawn Keim (NHX)	I think I heard you say that you confirm groundwater inputs with observational data? How is that possible? Don't you measure inflows?	All of our groundwater inflows are measured both in terms of water quality and volumes. We are not relying on any sort of visual observation, but rather measured data. Our water quantity and quality models are verified with measured data and the models are then updated. Groundwater inflows to the pit are collected in a sump. This water is monitored as per SNPO8 for both quantity and quality.
Rick Walbourne (ENR)	Will the scope of your water licence amendment include all the project update changes?	Yes. The w.l./l.u.p. amendment submission that will be made in February will include an updated project description that describes all changes to the mine plan.
Tim Heron (NWTMN)	Why aren't you including water quantity?	We are including water quantity. Both water quantity and quality are being updated and assessed as part of this water licence amendment application.
Frank Lafferty (DKFN)	Does the water from Gahcho Kue flow into Fletcher and then Alymer and then the Lockhart River?	Close, but it does not flow into Fletcher Lake. Kennady Lake is a headwater lake to the Lockhart River system. The water from Kennady Lake flows north through a series of small creeks and lakes into Kirk Lake, and then Aylmer Lake, and then heads down south through Artillery Lake to empty into the east Arm of Great Slave Lake.
Tracey Covey (GNWT)	Did you evaluate the influence of failing pit walls on meromixis? Is there a risk that pit wall failure will upset the meromixis?	Not exactly directly, but yes. Because the house rock is granite, it is extremely competent. There is really no risk of the pit walls failing. We do expect boulders or small rocks to come down, but not any sort of slumping.
Rick Walbourne (ENR)	With the expected adjustment to EQC's, are you also expecting to adjust the Site Specific Water Quality Objectives?	We do not expect to have to adjust the SSWQO. We're confident that we can meet these with adjusted EQC's. Remember that in many cases, the Board chose to set our EQC's at the maximum limits we originally modelled for end of year 3 discharge. Those values were based on modelling predictions, not on values protective of the water quality. We argued that the values should be set based on water quality. We'll make the same argument again when seeking an adjustment to the EQCs as part of this amendment application.

DE BEERS CANADA

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Topic	Question/Comment	DBC Response
Rick Walbourne (GNWT)	Will the groundwater model be included in the water licence amendment?	We will include groundwater model updated predictions in the water licence amendment application.
Dawn Keim (NHX)	It sounds like you keep saying the changes are small, but they aren't small. You're predicting a 7 year extended period of refilling. That's almost 10 years. Also, 100Mt of additional mine rock is a lot, equivalent to 33% more.	<p>Correct, the refilling period for Kennady Lake is projected, under the worst case scenario, to take an additional minimum of 7 years from what was originally anticipated.</p> <p>Correct, 100 Mt of additional mine rock is roughly a third more mine rock. We are aware that it is a lot of additional rock. As was mentioned, this is the worst case scenario and the planned case is actually for 65Mt, which is roughly 22% additional mine rock.</p>
Frank Lafferty (NWMTN)	Will fish make their way back to the lake once it is re-established?	Yes. We know it may take some time for fish populations to re-establish, particularly those species that have higher site fidelity than others; however, we do expect all species present pre-disturbance to re-establish post re-filling. We are required through our DFO authorization to re-establish those species.
Paul Green (GNWT)	Will a security estimate be submitted with the application or in parallel?	<p>We are already required to submit a RECLAIM re-evaluation in May of 2018. We are looking for direction from the GNWT and the Board on how to align this requirement, under the existing approved mine plan, and the requirement to submit an estimate in support of the w.l./lup amendment.</p> <p>Discussion was held between GNWT, Board staff, and De Beers in the meeting and it was decided that GNWT and De Beers would meet to discuss the path forward. That meeting took place on Dec.14<sup>th</sup> and it was decided that De Beers would work with GNWT to prepare a single Reclaim revised estimate which includes the items relevant to the w.l. amendment application but that those items should be clearly distinguished for clarity. The two processes: 1) reclaim revision under current mine plan, and 2) new security estimate for amended mine plan, will be aligned into 1 process.</p>

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Topic	Question/Comment	DBC Response
Reg (ECCC)	As the rock in the Mine Rock Pile breaks down over time during closure it could be a source of dust	The mine rock piles are comprised predominantly of large boulders and therefore are not anticipated to be a major source of dust emissions at closure. It was identified that finer rock material will not be deposited on the Mine Rock Pile, other than the crush that is used for the haul roads. The finer grained ramps will be anticipated to naturally revegetate over time, which will limit dust.