

July 4, 2019

Mark Cliffe-Phillips
Executive Director
Mackenzie Valley Environmental Impact Review Board
Box 938,
#200 Scotia Centre, 5102 – 50th Avenue
Yellowknife, NT X1A 2N7

Dear, Mark Cliffe-Phillips:

**Re: EA1819-01 Depositing Processed Kimberlite into Pits and Underground,
Diavik Diamond Mines Inc., Lutsel K'e Dene First Nation's Responses to the
Review Board Information Request to Parties (PR#43)**

Below are the Lutsel K'e Dene First Nation's responses to the Mackenzie Valley Environmental Impact Review Board's Information Requests (PR#43).

Information Request 1: Potential impacts to cultural use of Lac de Gras Area

Question 1 - Please describe how your group used the Lac de Gras area culturally (including hunting, fishing, trapping, gathering, and traveling) before mining started there.

The Diavik Diamond Mine is located in the asserted territory of the Akaitcho Dene First Nations, which includes the Lutsel K'e Dene First Nation, (LKDFN) Yellowknives Dene First Nation, and Deninu K'ue First Nation as well as other Indigenous groups. Through the Dene/Metis Mapping Project in the 1970s to 80s, traditional land use and occupancy mapping, from 1889 to the 1980s, for the entire asserted territory of the Akaitcho Dene First Nations, including the Lac de Gras area, was completed for each Akaitcho Dene First Nation. These maps depict some of the LKDFN's cultural uses, including hunting, fishing, trapping, gathering, grave sites, camp sites, and travel routes, in the Lac de Gras

area before mining started there. These maps and transcripts are publically available at the NWT Archives.

Our members' are traditional/contemporary users of the ʔek'á tué (Lac de Gras and Lac de Sauvage) and tthé k'óz déze (Coppermine River) areas. The dene yatie (language) names for these bodies of water were mapped through a traditional place names project undertaken by the LKDFN. Through this project, Elders identified over 250 traditional place names for lakes, rivers, streams, and areas of significance to the LKDFN, including ʔek'á tué and tthé k'óz déze.

Our members' would/do hunt, trap, fish, gather, camp, and travel through this area. The caribou - mainly from the Bathurst caribou herd – would/do migrate through this area. Before the mine was built, the Bathurst caribou herd was almost 500,000 animals. Our members' would/do harvest caribou in this area. Historically, our members would harvest caribou with spears in canoes at water crossings along the caribous' migration route - a key water crossing was/is located at The Narrows. This was/is an important area for caribou harvesting.

Our members' would trap wolves and white and red fox and other fur-bearing animals in the area was the mine is located. At one time, trapping was the main cash-economy occupation for many of our members'. Our members' also built cabins in the area for hunting and trapping that haven't been used since the mine was built.

While hunting and trapping in the area, our members' would fish in the area for subsistence purposes. Fish is an important alternative food source when caribou and other animals are scarce.

There are many signs of our existence on the land – old canoes, axe marks on trees, and tipi circles. Old camps and caches are common along trails that went through the area – from Artillery Lake to Alymer, Lac de Gras, and Coppermine River.

Question 2 - Please describe how your group would use and feel about the Lac de Gras area under the following scenarios:

a. Reconnecting empty pits and underground mine workings with Lac de Gras at closure (that is, Diavik's current closure plan for the mine).

The LKDFN accepts DDMI's current plan to reconnect empty pits and underground mine working with Lac de Gras at closure, as outlined in the current interim closure and remediation plan v3.2.

LKDFN would like to re-iterate that the First Nation has repeatedly called for DDMI to deposit "country rocks" into the empty pits and underground mine workings. LKDFN does not support DDMI creating large "country rock" piles, or new landforms, that are alien to the existing landscape and will likely not naturally re-vegetate.

The LKDFN is not confident that water quality (e.g., TDS, DO) in the future pit lakes will be suitable for drinking, and that the fish in these pit lakes will be safe for consumption by humans and wildlife. These real or perceived socio-ecological impacts - a direct result of Diavik Diamond Mine - effectively alienates our members from continuing to practice our way of life in that area.

To alleviate the LKDFN's real or perceived concerns about socio-ecological impacts associated with water quality and fish during closure and post-closure, the LKDFN strongly recommends that the AEMP include multiple, meaningful, and measureable water quality and fish parameters based on traditional knowledge. This would provide traditional users with more meaningful indicators of compatibility and suitability for traditional uses. The LKDFN requests that the Mackenzie Valley Environmental Impact Review Board (MVEIRB) require the meaningful inclusion of traditional knowledge-based parameters for water quality and fish in the AEMP.

DDMI should also improve their communication and engagement with the LKDFN so that members have the knowledge they need to determine whether or not it is safe to drink water and eat fish from the pit lakes. This information needs to be disseminated in a culturally appropriate, meaningful, and understandable manner by DDMI. Closure and, especially post-closure water quality and fish data and analysis should be publically accessible, so that traditional users can check the water quality and fish is safe for consumption.

b. Putting processed kimberlite into the pits and underground mine workings before reconnecting them to Lac de Gras (that is, the proposed activities for this environment assessment).

At present, the LKDFN does not support this scenario – putting processed kimberlite into the pits and underground mine workings and reconnecting the pit lakes to Lac de Gras. To be clear, it is the LKDFN’s position that under no circumstances should any pit lakes and underground mine workings containing processed kimberlite be reconnected to Lac de Gras. Furthermore, the LKDFN does not support putting any processed kimberlite in pit lake A21 due to the likelihood of meromixis breaking down in this pit lake.

The LKDFN has reservations about the water quality modeling and its accuracy. As reflected in our Information Requests to DDMI, the LKDFN is concerned about the values used for processed kimberlite pore water chemistry dataset, pore water density, and rate of pore water release. As such, current water quality modeling is not based on worse case scenarios and, therefore, does not provide insight into water quality conditions that are possible. It is also unclear what the values for nitrate, nitrite, and ammonia from Dominion Diamond Mine’s beartooth are based on (e.g., number of samples, range of concentrations, etc.). It is also unclear why sensitivity modeling was not conducted for A514 or A21.

Furthermore, current water quality modeling reveals worrisome results, especially for pit lake A21. Based on water quality modeling, “...pit lake A21, under modeled scenarios

2a, 3a, and 4a, water quality constituents decrease very quickly at the surface, but fluctuate at the 40 m depth. Nitrite, nitrate, and molybdenum are predicted to exceed the AEMP benchmarks for scenarios 3a and nitrite is predicted to exceed the AEMP benchmark in scenario 4a. All constituents are predicted to be below AEMP benchmarks for scenario 2a” (DDMI, 2019, p. 60). “... [The] results for pit lake A21 scenario 3a predicts an adverse high magnitude effect for a moderate duration within the PDA during closure and post-closure. Given that an adverse effect to pit lake A21 for scenario 3a is anticipated, there is the potential that an adverse effect to Lac de Gras could occur” (DDMI, 2019, p. 75). Water quality modeling “...indicates that high concentrations of TDS in the bottom layer...may break down after approximately 50 years for A21. The breakdown of meromixis and full mixing in A21 is a result of the shallower depth of water cover in A21 relative to A418 and A154” (DDMI, 2019, p. 56). Furthermore, closure monitoring of pit lakes containing processed kimberlite would not be able to demonstrate that meromixis could be maintained over the long-term, and, therefore, is not indicative of the likelihood remaining a stratified pit lake. Based on these findings, the LKDFN does not support depositing processed kimberlite into pit lake A21.

The water quality modeling indicates that pit lakes A418 and A154 are more likely to remain stratified over a 100-year period than pit lake A21; however, this temporal scale is too short. A 100-year period is equivalent to only one or two generations of traditional users. Our members will continue to use the area for thousands of years. As such, a more appropriate scale would be in perpetuity. This temporal scale better reflects the potential socio-ecological impacts associated with the proposed project. The LKDFN is not confident that a state of meromixis in any of the pit lakes and underground mine workings in perpetuity is possible.

The PK pore water is also the main source of contaminant loading in the pit lakes, with water quality modeling indicating that this load will gradually diffuse upwards and disperse into Lac de Gras over a period of many decades. Meromixis will eventually breakdown over the very long-term (e.g., more than 100 years). Over time, the high salinity layer at depths below 40 m will dilute and mix with overlying water. With a 50 m

water cover, the stratified layer expands rapidly over the first 8-12 years followed by a slow, but steady dilution of the layer with surface water. It is likely that full mixing will occur in the next 50 to 100 years, after the initial 100 years. With a 150 m deep water cap, the stratification is much stronger; however, stratified later continues to mix with overlying waters and it is anticipated that in the future, this later will eventually mix with Lac de Gras. Furthermore, there is no proof that a state of meromixis in the pit lakes can and will be maintained in a 100-years or in perpetuity, or that if a state of meromixis fails that any other contingency measures will be effective.

Due to these uncertainties, it is the opinion of the LKDFN that reconnecting pits and underground mine workings containing processed kimberlite with Lac de Gras could cause significant adverse impacts to water quality and fish and aquatic species and fish habitat in the Lac de Gras watershed. This could also cause significant adverse impacts to the ability of current and future generations of traditional users from practicing our way of life in this area. As such, the MVEIRB should apply the precautionary principle and recommend to the Responsible Ministers that the proposed reconnection of pits and underground mine workings containing processed kimberlite to Lac de Gras should not be permitted. If Lac de Gras were contaminated by the processed kimberlite in the pit lakes, this would render the area unusable for traditional uses. Given the irreversibility and permanency of placing processed kimberlite in pit lakes and re-connecting those pits to the greater ecosystem, this is a risk that should not be taken.

c. Putting processed kimberlite into the pits and underground mine workings and not reconnecting them with Lac de Gras

The LKDFN is conditionally supportive of depositing processed kimberlite, especially fine and extra fine processed kimberlite, into empty mined out pits and underground mine workings because it may offer the most physically secure long-term storage location thereby minimizing physical failure risks, with the exception of pit lake A21. However, approval for the proposed project should be contingent on measures to mitigate risks. DDMI should be required to conducting monitoring and research pertaining to the inputs

and assumptions used in modeling. There should also be requirements for calibrating the models and updating the model based on monitoring and research results. This should be done progressively to help incrementally improve. The depth of the fresh water cap and magnitude of emergency storage capacity should also be established in measures.

LKDFN thinks that not reconnecting the pit lakes and underground mine workings would substantially reduce the risk of exposing the Lac de Gras watershed to contaminants associated with this proposed project and, potentially, alienating traditional users from the area.

Information Request 2: Closure Options

Question 1 – When determining if the pits should be reconnected to Lac de Gras at closure, is water quality in the pit lake the only criteria that should be considered?

As stated above, the LKDFN does not support the pit lakes containing processed kimberlite being reconnected to Lac de Gras, based on the multiple reasons. For completion purposes, the LKDFN will provide a response to IR #2.

Although water quality is critical to ensuring that traditional users can continue to use this area in the present and future, water quality should not be the only criteria that should be considered when determining if the pit lakes should be reconnected to Lac de Gras at closure.

In addition, water quality criteria should not be solely based on scientific parameters of maximum acceptable concentrations for various substances, as outlined in the AEMP. As previously stated, water quality criteria should also include multiple, measurable, and meaningful parameters based on traditional knowledge (TK) (e.g., see Parlee, Manseau, & Lutsel K'e Dene First Nation, 2005). The LKDFN recommends conducting a literature review and hiring consultants that possess TK, or consultants that hire TK holders - with TK of the area where the mine is located - to develop these parameters. This is necessary to mitigate the real and/or perceived significant and adverse socio-ecological impacts of this proposed project. Meaningful incorporation of water quality parameters based on TK into, at minimum, the Aquatic Effects Monitoring Program, Wildlife Monitoring Program, and Interim Closure and Reclamation Plan for the Diavik Diamond Mine, should be a measure in this environmental assessment.

Question 2- If not, please describe what additional criteria for re-connection should be considered.

The additional criteria for determining whether or not the pit lakes should be re-connected to Lac de Gras should include:

Criteria #1 – Effects on traditional users and uses

The *Comprehensive Study Report* (1999) states that, “Diavik [has] concluded that the project would not have a significant negative impact on traditional “on-land” activities” (p. viii). And “[t]he RAs have also concluded that Diavik will be required to monitor the effects of its activities on Aboriginal people who may use the Lac de Gras area for traditional purposes” (p. 89). To the best of our knowledge, DDMI has not monitored or reported on the effects of its activities on Indigenous peoples who use the Lac de Gras area for traditional purposes. As such, the effects of reconnecting the pit lakes containing processed kimberlite should be identified and monitored with the Indigenous peoples that the proposed project would affect. This should be done as part of this process.

The results from this on-going monitoring program should be used to inform the aquatic effects monitoring plan, the wildlife monitoring plan, the closure and reclamation plan, and any other applicable plans that may affect traditional users and uses.

Criteria #2 – Water quantity at The Narrows

Maintaining adequate water level and flow at “the narrows” – the narrow channel between Lac de Sauvage and Lac de Gras – during pit filling at closure should be another criteria. The water quantity at the narrows should be maintained at pre-mining levels to facilitate fish and caribou (and other wildlife) movement between these two large bodies of water.

Criteria #3 – Water quality in Lac de Gras

The water quality of Lac de Gras should also be considered at closure. Lac de Gras is the receiving body of water for mining effluent from both Diavik Diamond Mine and Ekati

Diamond Mine. To account for the cumulative affects of mineral resource extraction in the area, the water quality of Lac de Gras should be considered to determine whether or not additional contaminates from pit lakes will cause contaminate concentration levels to exceed acceptable levels.

Criteria #4 – Potential effects on fish and fish habitat in Lac de Gras

The current water quality models and the suitability of surface water for fish and fish habitat are based on models. Actual performance of processed kimberlite in pit lakes should be used to calibrate and refine models to better predict possible future performance and conditions in pit lakes containing processed kimberlite and if those pits will support fish and fish habitat in the very long-term. The models should be updated on an annual basis. This revised model results should be used to determine whether or not the pit lakes are connected. The downfall of this approach is the models are based on relatively short-term performance and may not be indicative of actual long-term performance.

Criteria #5 Effects on migratory birds and waterfowl

When the pit lakes containing processed kimberlite are filled with water from Lac de Gras, it is likely that the processed kimberlite will mix with the fresh water and could create water quality conditions that exceed AEMP benchmarks and could cause adverse effects on migratory birds and waterfowl that land on and remain in the pit lakes at this time. The likelihood of negatively affecting migratory birds and waterfowl should be another criteria. Methods to deter migratory birds and waterfowl from using the pit lakes at closure should be deployed.

Criteria #6 Effects on caribou and other wildlife

Traditional Knowledge Holders are concerned about the potential for caribou and other wildlife to ingest contaminated water in the pit lakes. The likelihood of negatively affecting caribou and other wildlife should be another criteria. Methods to deter caribou and other wildlife from using the pit lakes at closure should be deployed.

Sincerely,

Chief Darryl Marlowe
Lutsel K'e Dene First Nation