Diavik Diamond Mines (2012) Inc.
P.O. Box 2498
Suite 300, 5201-50th Avenue
Yellowknife, NT X1A 2P8
Canada
T (867) 669 6500
F 1-866-313-2754

Charlie Catholique, Chair
Environmental Monitoring Advisory Board
PO Box 2577
Yellowknife, NT X1A 2P9
Canada

16 September 2020

Dear Mr. Catholique:

Subject: DDMI 2019 Environmental Agreement Annual Report, revised

Please find enclosed Diavik Diamond Mines (2012) Inc.'s (DDMI) revised/finalized 2019 Environmental Agreement Annual Report (the Report) for the Diavik Mine as per Article XII of the Environmental Agreement. The revised Report addresses comments and recommendations from the Environmental Monitoring Advisory Board and the Government of Northwest Territories in July 2020 following a review of DDMI's Draft Report submitted to stakeholders in June 2019. DDMI's revisions to the Draft Report are highlighted in the attached Table of Conformity.

Please do not hesitate to contact the undersigned if you have any questions related to this submission.

Yours sincerely,

Kofi Boa-Antwi
Superintendent, Environment

cc: John McCullum, EMAB
Loretta Ransom, GNWT-ENR

Attachment: DDMI 2019 Environmental Agreement Annual Report, revised

Table of Conformity to EMAB and GNWT ENR Recommendations for the Final 2019 EAAR

	Reference	Comment	Recommendations	DDMI Response/Location in 2019 EAAR
2019 GNWT Comments				
1	General	ENR has retained Zajdlik and Associates to assist ENR with the review of the EAAR. ENR has provided these comments herein, but please see the attached memo for further details about the review.	N/A.	N/A
2	General - Figures (e.g. Figures 2, 6, 12, 13)	Not all figures are clear - the size of the fonts and the clarity of some of the figures are difficult to read.	Please use proper software to copy-paste figures into the report so that they are all clear to the reader.	Acknowledged. DDMI has improved the quality of figures throughout the report.
3	Table 2, page 9. Environmental Air Quality Monitoring and Management Plan.	Under the heading "Updated in 2019 (Y/N)" it is indicated that the Environmental Air Quality Monitoring and Management Plan (EAQMMP) was not updated in 2019 but the text in this section contradicts that, stating the EAQMMP was last updated in 2019.	Correct Table 2 to indicate if the EAQMMP was updated in 2019 or not.	Corrected.
4	Table 3, page 11. Lake sediments.	The text on page 11 states that lake sediments were last sampled in 2019 but under the column heading "Completed in 2019 (Y/N)" it states "no".	Correct Table 3 to indicate if lake sediments were sampled in 2019 or not.	Corrected in Table 3. Lake sediments were sampled during the 2019 comprehensive AEMP open water program.
5	Table 3, page 11. Lake bottom bugs.	The text on page 11 states that lake bottom bugs were last sampled in 2019 but under the column heading "Completed in 2019 (Y/N)" it states "no".	Correct Table 3 to indicate if lake bottom bugs were sampled in 2019 or not.	Corrected in Table 3. Lake bottom bugs were sampled during the 2019 comprehensive AEMP open water program.
6	Table 3, page 11. Fish health.	Under the column heading "Completed in 2019 (Y/N)" it states "yes". The text on page 11 states that fish palatability is completed every three years with the next survey to be done in 2021, implying it was not done in 2019. Later parts of the report also indicate that fish palatability was not tested in 2019.	Correct Table 3 to indicate if fish palatability was tested in 2019 or not.	Large bodied fish were not sampled in 2019 however; small bodied fish (Slimy Sculpin) were sampled in 2019. DDMI has included the distinction between the two fish programs within Table 3 (page 11 of

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				the 2019 EAAR) so it is clearer to the reader.
7	Bases for Comparison - page 22	DDMI (Rio Tinto 2020, Table 1) states that the Agreement Commitment is to "compare results to predictions in environmental assessment and the Comprehensive Study Report – Diavik Diamonds Project (CSR)". This document (Canada, 1999) states: "Diavik predicted that concentrations of all water quality parameters (e.g. metals, ammonia, chloride) would be below drinking water and aquatic life thresholds at the smallest assessment boundary (0.01 km2) around the discharge except for phosphorus". DDMI (Rio Tinto 2020) presents this environmental assessment prediction as: "Water will remain at a high quality for use as drinking water and by aquatic life (i.e. meet Canadian Council of Ministers of the Environment (CCME) thresholds)". The DDMI (Rio Tinto 2020) and Canada (1999) environmental predictions differ in that no spatial extent is explicitly included in the former's presentation. The 2019 AEMP was conducted under AEMP design version 4.1 (Rio Tinto, 2016) although the AEMP report does include updates and directives that led to a draft AEMP design 5.1. Action levels 1-3 for water quality indicators remain unchanged from AEMP design 4.0 through to AEMP design 5.1. The first two action levels make comparisons between concentrations in the near field and quantiles of the reference dataset. The third action level involves comparisons with effects benchmarks that are Canadian Water Quality Guidelines, some of which	In order to fulfill the commitment made to "compare results to predictions in environmental assessment and the Comprehensive Study Report" (Rio Tinto, 2020), DDMI should demonstrate "that concentrations of all water quality parameters (e.g. metals, ammonia, chloride) would be below drinking water and aquatic life thresholds at the smallest assessment boundary (0.01 km2) (Canada, 1999)". For example, in 2018, this would involve estimating the spatial extent of Canadian water quality guideline exceedances for aluminum and presenting the results within the EAAR.	The aluminum concentrations in 2018 at the smallest assessment boundary (mixing zone effluent) were below the AEMP Effects Benchmarks for protection of aquatic life and drinking water (Table 3-3 2018 AEMP Annual Report). The referenced aluminum concentrations exceedances are from samples collected during the 2018 AEMP open water season and not the mixing effluent zone (the smallest assessment boundary) and reflect the delayed influence of direct discharge of dewatering flows from the A21 dike in 2017. The dewatering event was a onetime event required to complete dewatering of the A21 Pit and therefore is not anticipated to be an ongoing source of effects on the water quality of Lac de Gras. Since 2018, A21 pit water has been diverted to the North Inlet for treatment at the North Inlet Water Treatment Plant prior to discharge. In 2019, open water AEMP aluminum concentrations were

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		have the capacity for modification via site-specific concentrations of toxicity modifying factors. It is important to note that the comparisons with benchmarks do not involve individual samples but rather percentiles of the distribution of concentrations. The comparison envisioned in Canada (1999) is whether a concentration in a sample exceeds the Canadian water quality guideline not an arithmetic combination of percentiles and reference area results.		below the AEMP effect benchmark criteria. DDMI has included a summary of the mixing zone comparison to AEMP Benchmarks which are based on the Canadian Water Drinking Quality Guidelines in the 2019 summary of water quality on page 23 of the 2019 EAAR and will include this summary of the past year concentrations in future reports.
8	Nutrient Enrichment - page 22	Canada (1999) states that with respect to phosphorus: "… although lake-wide enrichment can be expected, increases beyond 40% tend to be confined to 20% of the surface area of Lac de Gras adjacent to the mine site". No other numeric statements regarding nutrient enrichment were made. Measures of nutrient enrichment discussed in Canada (1999) include total P, total N and chlorophyll a. DDMI (Rio Tinto 2020) makes the following statement regarding nutrient enrichment: "Nutrient enrichment (increased nutrients) is likely from the mine water discharge (and may change the trophic status (a measure of how productive the lake is) of up to 20% of Lac de Gras)". The conclusion presented by DDMI (Rio Tinto 2020) regarding nutrient enrichment is: "Confirmed to date based on AEMP sample results – the area of Lac de Gras impacted varies by year and has exceeded 20% twice during ice cover but never during open water". Golder (2020) reports on nutrient enrichment measurement endpoints and with	ENR recommends that the structure of the following sentence could be improved by adjusting parentheses: "Nutrient enrichment (increased nutrients) is likely from the mine water discharge (and may change the trophic status (a measure of how productive the lake is) of up to 20% of Lac de Gras)" (Rio Tinto,2020). Nutrient enrichment effects were noted in both open water and under ice seasons in 2019 (Golder, 2020). The spatial extent of effects was much larger than 20%. ENR recommends that DDMI modify the conclusion presented to reflect these effects and, in the future, state the area of the lake affected rather than stating that more than 20% of the lake was affected.	DDMI has revised the text to be more specific that phosphorus is the limiting nutrient for an enrichment effect beyond 40%. Phosphorus concentrations in 2019 were below normal range, and the impacted area of the lake was 0%. Further, the biological response to the nutrients discharged from the Mine were proportional to measured phosphorus concentrations and did not reflect the elevated nitrogen concentrations throughout the lake. These results underline the importance of phosphorus limitation in Lac de Gras.

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		respect to total N, concluded that "the entire lake was affected using the open-water data, and 484 km^2 or 85% of the lake was affected using the ice-cover data".		
9	Water and Fish, page 23.	The report states "Fish tissue concentrations of metals from fish sampled in 2019 were similar to results since 2013, with the exception of molybdenum which exhibited an increase of 34%." The reason for the increase in molybdenum or actions, if any, to be taken to address this were not given.	Provide an explanation of why molybdenum increased 34% in fish tissue in 2019.	DDMI believes ongoing/future field programs associated with the AEMP will indicate whether the results for molybdenum in 2019 was an anomaly or a trend, which will inform response actions, if necessary.
10	EEAR Trend Reporting - page 27	DDMI (Rio Tinto 2020, Section 3) presents summaries of conclusions on an annual basis. Those conclusions are further summarized by a presentation of a weight-of-evidence syntheses from 2007-2016 (See Rio Tinto 2020, Figure 6). The presentation is truncated at 2016, the end date of the last 3-year annual summary report. The presentation precludes an assessment of changes in these integrative measures for 2017-2019 within the EAAR although these results are available (See for example, Golder 2020, Table 11-1).	1. Graphics are easily understood presentations suitable for the non-technical EAAR. ENR recommends DDMI to include the available integrative weights-of-evidence in the EEAR on an annual basis rather than waiting for results from a 3-year AEMP review which can lead to as much as a 3-year lag between availability and presentation. This will allow readers to visually assess change up to the current year rather than waiting for as much as 3 years. 2. Other easily understood graphics include a bar chart of the annual number of action level exceedances by analyte class. The graphic provides a visual assessment of how action level exceedances change by year. ENR recommends that DDMI include these graphics accompanied by a footnote	1. The weight-of-evidence (WOE) analysis requires the results of all endpoints for exposure and effects (i.e., biological responses) and is conducted every three years, in conjunction with the comprehensive AEMP sampling program, when all components and all locations are sampled (as per approved AEMP Design Plan Version 4.1). The WOE integrates the following field components: water quality, sediment quality, benthic invertebrates, lake productivity (i.e., nutrients, chlorophyll a, plankton biomass, and community structure), and fish population health. Benthic invertebrates, fish population health, and sediment quality data are not collected during

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			presenting any limitations of these graphics.	interim AEMP years, i.e. first and second years (2017 and 2018) and therefore not all components are available for a WOE evaluation in those years and in future interim years. DDMI will provide an update inclusive WOE figure in the 2020 EAAR following completion of the 2017 to 2019 Re-evaluation Report. DDMI has included the 2019 WOE ranking as table 5 on page 24 of the 2019 EAAR to address GNWT-ENR's recommendation. 2. DDMI believes a single summary table is a more appropriate way to show action level exceedances each year and has included an action level summary table (Table 4 in 2019 EAAR) for the 2019 AEMP program and will provide summary tables in subsequent EAARs. Specific details of action level evaluations and exceedances are provided both in the AEMP annual and three-year re-evaluation reports as tables. If a new Action Level is reached for a parameter for the first time these details will also be summarized and addressed within the EAAR.

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11	Metal Residues in Fish - page 45	With the exception of East Island lakes post-closure, DDMI predicted "that metal concentrations in the flesh of fish in Lac de Gras are not expected to exceed the guidelines for safe human consumption" (Canada, 1999). Canada (1999) further states that" The GNWT reviewed the concern the Yellowknives Dene First Nation (YKDFN) raised with respect to mercury contamination and fish, and agree that the mercury consumption guideline of 200 µg/kg mercury guideline be applied to fish used for sport and subsistence fishing". The YKDFN elaborated on this: "The YKDFN raised a concern with respect to mercury contamination and fish. Specifically, they are concerned with the use of the 500 µg/kg mercury consumption guideline applied to commercially marketed fish rather than the 200 µg/kg mercury guideline applied to fish used for sport and subsistence fishing. Natural background level of mercury in lake trout are reportedly at 181.5 µg/kg. Therefore, the concern is with the small incremental increase required to reach the consumption guideline. Even though the fish of Lac de Gras are currently not utilized as a sport or subsistence fishery, it has the potential to be used in the future. The YKDFN want assurance that the fish are safe to eat if they do choose to utilize them" Canada, 1999). However, within the EAAR, DDMI (Rio Tinto 2020) makes statements regarding Hg in fish tissues in the context of the 500 µg/kg mercury consumption guideline applied to commercially marketed fish.	ENR recommends DDMI discuss why the Hg guideline applicable to commercially marketed fish is being used for lake trout in Lac de Gras despite objections by the YKDFN and despite the prediction that the average Hg concentration would not increase over the mean of 181.5 µg/kg.	DDMI notes that the mine is not a source of mercury input to Lac de Gras as mercury is not a constituent in mine effluent discharged to the lake. DDMI also notes that mercury is naturally elevated in fish in Lac de Gras and Lac du Sauvage.
12	Fish, page 45.	In this section the prediction from the environmental assessment (EA) is stated and usually followed by a statement from DDMI on whether or		1. DDMI's statement regarding the referenced EA prediction has been revised (page 46 of the 2019 EAAR).

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	Mercury concentrations.	not the prediction was accurate. However, for the EA prediction that "Mercury concentrations will not increase above the existing average background concentration of 181.5 µg/kg;" the response from DDMI is not directly linked to the EA prediction. DDMI's response compares mercury concentrations to the average mercury concentration in lake trout from Lac De Gras in 2008. There is no reference to the 181.5 µg/kg threshold or an explanation of why this threshold was not referred to.	1. DDMI should state whether average mercury concentrations have increased above the 181.5 µg/kg threshold. 2. If there is a valid reason for using the 2008 data instead of the baseline that existed at the time of the EA that should be explained.	"The average mercury concentration in lake trout caught from Lac de Gras has increased above background concentrations of 0.182 mg/kg (year 1999 baseline) in some years but overall concentrations have not significantly increased in the last 24 years. Mercury in lake trout is naturally occurring, as the Mine is not a source of mercury input to Lac de Gras. In general, larger and older fish naturally have increased mercury concentrations as mercury bio accumulates in fish tissue. The instances of fish caught with mercury levels above baseline are likely a combined result of fish populations aging, and the bioaccumulation (builds up in tissue) and biomagnification (levels increase up the food chain) effects of mercury". 2. See above.

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13	Fish Health Measurement Endpoints, page 45	During the AEMP TK (traditional knowledge) session held in 2018, participants expressed concerns regarding parasitism. Rio Tinto (2020) acknowledged this concern stating that "To date, systematic documentation of cyst presence was not done consistently; however, henceforth, more care will be given to tracking this indicator". It is not clear whether this is a formal commitment to include parasitism as a measurement endpoint in the weight of evidence synthesis of AEMP information. Golder (2020, Table 8-1) presents action levels for fish. Footnote b states that a toxicological response could include "increased incidence of pathology". An increased incidence of pathology, for example, parasitism rates, is not included in the summary of statistical differences in fish health endpoints (Golder 2020, Table 8-2). The AEMP design document version 4.1 (Rio Tinto, 2016, Table 4.10-2) presents endpoints and lines of evidence for each ecosystem component–toxicological impairment hypothesis. This list includes "Pathology – Occurrence" as a line of evidence for fish population health. The equivalent table in AEMP design document version 5.1 (Rio Tinto, 2019b, Table 4.10-2) does not include "Pathology – Occurrence" as a line of evidence for fish population health which is inconsistent with the statement: " however, henceforth, more care will be given to tracking this (presence of cysts) indicator" (Rio Tinto 2020). The slimy sculpin parasitism data collected in 2019 was examined. DDMI (Golder 2020) discarded 645 of 1,339 (almost 50%) of slimy sculpin captured in 2019	1. DDMI predicted an absence of effects on fish and an absence of cumulative effects on fish (Canada, 1999). Although increased parasitism in slimy sculpin may not translate into an effect on the important metric catch-per-unit effort for lake trout the data suggest that parasitism is associated with diamond mining around Lac de Gras (Ekati and Diavik). ENR recommends that the occurrence of pathology should be reinstated as a line of evidence for fish population health in the AEMP design documents. 2. ENR recommends DDMI reconsider pooling of farfield areas when making statistical inferences for parasitism, and likely should do so for other biological measurement endpoints due to the potential for cumulative effects of the Ekati and Diavik mines.	1. This comment should be more appropriately addressed during the GNWT-ENR's technical reviews of the annual AEMP report which is submitted in advance of the EAAR. 2. This comment should be more appropriately addressed during the GNWT-ENR's technical reviews of the annual AEMP Report, which is submitted in advance of the EAAR.

		from statistical analyses. DDMI (Golder 2020) does report that "the number of fish infected with tapeworms was different among sampling areas but was not associated with distance from the mine". This conclusion was transparently repeated in DDMI (Rio Tinto 2020). Examination of the data shows that parasitism rates are highest in the nearfield and farfield A, an area which combines effluent from Diavik and Ekati operations. It appears that the lack of significance in parasitism between the nearfield and farfield areas is due to the pooling of farfield areas including farfield area A. It is likely that parasitism is significantly different in the Diavik nearfield relative to far field area 1 and 2 and midfield area 3.		
14	Figure 8 and 9 on page 46 and 47. Inconsistent units.	The text on pages 45-47 refers to mercury concentrations in µg/kg. The graphs on pages 46 and 47 use µg/g as a unit of measurement. As this is a report for a wide variety of users it would be best to make it as straightforward and easy to understand as possible. Using consistent units in graphs and texts would make it easier for the average person to understand.	Use consistent units of measurements between the text and the visuals.	Corrected. Mercury concentrations in fish studies have been changed to mg/kg throughout this section within the text and graphs.
15	Air Quality, page 54	Total Suspended Particulates (TSP) are a concern at northern mine sites. Every effort should be made to monitor and mitigate TSP. The TSP monitoring program at Diavik has not provided enough reliable data to validate the model predictions.	Continue to monitor TSP to provide validation of the modelling exercise.	DDMI acknowledges the comment provided by ENR and discussions regarding the TSP program are ongoing.
16	Vegetation and Terrain, page 60. Total habitat lost	DDMI has decided to change the way total habitat loss has been calculated for 2019. Portions of terrestrial habitat within the Mine footprint that are undisturbed are no longer being counted in the disturbed habitat. In order for this to be a valid way	(1) Provide information on if the terrestrial habitat within the Mine footprint are being used by wildlife.	(1) DDMI removed areas of the Mine foot print and reclassified them as undisturbed. The removed portions of terrestrial and water habitat have remained

		to calculate disturbed habitat DDMI should provide information on whether these undisturbed spots are functionally available to wildlife and/or being used by wildlife. Information on the size of the habitat that is no longer being considered disturbed should be provided as well.	(2) Provide the size of the terrestrial habitat that is no longer considered as disturbed.	physically undisturbed residual areas since construction and through the end of 2019. As such, these residual undisturbed areas were removed from the total Mine footprint calculations for the analysis of the 2019 Wildlife Management Plan (WMP). The areas are utilized by wildlife and there is evidence to support this in the annual wildlife management reports in the form of photos, incidental wildlife sightings, and wildlife reports. Habitat types that were removed include areas of heath tundra, heath tundra plus bedrock, tussock/hummock, boulder complex, and shallow and deep water. (2) The total area removed from the Mine foot print was 88.2 hectares.
17	page 63 - Climate and Air Quality - 2nd bullet	Author states that the mine "will be a very minor contributor of greenhouse gases." and that emissions "remain relatively stable across years". What does "minor" mean? In the NWT, Diavik was responsible for 16% of NWT's emissions in 2018 (15% in 2017 and 12% in 2016). Diavik is a fairly significant contributor to GHGs in the NWT.	Please define "minor" or remove the word if not appropriate.	DDMI would like to note “minor” is the terminology used in the EA prediction “…the proposed Diavik Project is a very minor emission contributor to Canada’s total emissions” and therefore suggests not removing the word as it relates to Diavik’s overall impact on emissions Canada-wide and not the NWT emissions alone. DDMI has added this context to the text

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				to make this distinction on page 56 of the 2019 EAAR Report.
18	Reevaluating a Zone of Influence, page 65.	Reference to new Zone of Influence information would be helpful to the reviewer.	A link to the reevaluation of the zone of influence review should be included in the reference section.	Included reference to the 2019 Wildlife Monitoring Report in text (page 68).
19	Table 12, page 81. Formatting.	The text in the second row of Table 12 is cut off.	Reformat the table to make all text visible.	Reformatted.
20	Annual Report Requirements under the Diavik Environmental Agreement - section 12.1(c)(x) Page 86	It is noted that on page 93 of the report alerts readers that the WLWB's online registry contains comments made by reviewers on documents that DDMI submitted to the WLWB. This similar statement should be made in section 4 of the report (Community Engagement and Traditional Knowledge). The statement in section 4 that "There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2019" is correct but misleading. A reference should be made here that multiple groups commented on regulatory documents submitted by DDMI to the WLWB and that there were an number of intervenors in the DDMI EA.	Provide a more fulsome explanation of public concerns and responses to public concerns.	DDMI has included a statement about the WLWB process in Section 4 (page 91 of the EAAR) for clarity. Details of the Environmental Agreement can be found in the Introduction section (page 1).
21	Traditional Knowledge Panel, page 89.	DDMI notes that the next TK session will be in September of 2020. Many workshops and gatherings have been cancelled due to the COVID-19 pandemic. If DDMI is not planning to hold this meeting due to COVID-19 restrictions this section should be updated.	Update with the next TK session if need be.	DDMI has revised the text to “next TK panel” (page 94 of the 2019 EAAR) as the date of the next TK session is currently unknown, due to the COVID-19 pandemic.
22	Annual Report Requirements under the Diavik Environmental	The Diavik Environmental Agreement requires that the Annual Report include a comprehensive summary of operational activities for the next year. It is unclear if this information is contained in the report.	DDMI should provide a comprehensive summary of operational activities for the next year (2020).	Provided in Section 6.

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	Agreement - section 12.1(c)(v) Page 93	It is unclear if the following statement should reference 2020 instead of 2019. "The key operational activities planned for 2019 include continuing the Phase 7 dam raise at the PKC Facility, continued efforts on placing cover materials for reclamation of the WRSA-NCRP, continued resloping of the WRSA-NCRP, and the continued development of the underground and open pit mines including a feasibility study on A21 underground development and A21 groundwater monitoring."		
EMAB Comments on Draft 2019 EAAR				
1	Plain Language		The plain language aspect of the Executive Summary of the report is good. Plain language could be improved throughout the body of the report.	DDMI appreciates EMAB's acknowledgement of our efforts to make the report accessible to a broad audience. DDMI welcomes EMAB's suggestions to improve these reports.
2	Executive Summary Translations		Translations of the Executive Summary into Dogrib, Chipewyan, and Inuinnaqtun are not included in the draft 2019 EAAR, as required by Section 12.1 (c-xiii) of the EA. EMAB understands these will be included in the final version.	Translations were not available at the time of DDMI's submission of the draft version to the Board. The final report will include the translations into Dogrib, Chipewyan, and Inuinnaqtun.
3	Monitoring Programs	Page 11, row 12 (Fish Health), column 3, indicates that Fish health tests through palatability and/or tissue chemistry were completed in 2019.	It is recommended that Diavik put an "N" in this column, as fish palatability tests did not occur in 2019.	Addressed.
		Page 11, row 15 (Total Suspended Particulates), column 3, indicates that TSP monitoring took place in 2019.	It is recommended that Diavik put an "N" in this column, as TSP monitoring was not conducted in 2019.	Addressed.

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4	Environmental Air Quality Reporting	EMAB notes that it finds Diavik's EAQMP to be inadequate due to not meeting its commitments in the Environmental Agreement, particularly Diavik's decision to terminate TSP monitoring. EMAB has also identified a number of inadequacies in the program and design including: ▪ calibration and maintenance of monitoring equipment, ▪ data completeness, ▪ poor CAM/TSP monitoring program design, modelling shortcomings including: ▪ incorrect weather data, ▪ model does not include A21 pit, ▪ location of TSP monitoring stations appears incorrect based on current wind data, ▪ model appears to underpredict TSP deposition levels EMAB is preparing a request that the Minister review this program under section 7.5 of the EA.		DDMI appreciates the notice regarding EMAB's submission to the Minister.
5	Aquatic Effects Monitoring Program	Page 45 of the Draft EAAR states the EA prediction that "Mercury concentrations will not increase above the existing average background concentration of 181.5 µg/kg". Diavik's listed response to the prediction is "The average mercury concentration in lake trout from Lac de Gras has been similar to that found during 2008".	Diavik should report if average mercury concentrations were above or below 181.5µg/kg, to be in accordance with EA section 12.1 (c-vii).	DDMI's statement regarding the referenced EA prediction has been revised (page 46 of the 2019 EAAR). "The average mercury concentration in lake trout caught from Lac de Gras has increased above background concentrations of 0.182 mg/kg (year 1999 baseline) in some years but overall concentrations have not significantly increased in the last 24 years. Mercury in lake trout is naturally occurring, as the Mine is

				not a source of mercury input to Lac de Gras. In general, larger and older fish naturally have increased mercury concentrations as mercury bio accumulates in fish tissue. The instances of fish caught with mercury levels above baseline are likely a combined result of fish populations aging, and the bioaccumulation (builds up in tissue) and biomagnification (levels increase up the food chain) effects of mercury".
6	Wildlife Monitoring	EMAB is pleased that Diavik is developing a stand-alone Program Description for the Wildlife Monitoring Program.	In the Behaviour Monitoring Section (pg. 67), Diavik should include details about how they locate caribou to conduct observations on, or if behaviour scans are conducted incidentally when caribou are seen while conducting other monitoring activities.	DDMI has included the text on Page 70 "Ground based-caribou observations are conducted by DDMI Environment staff on caribou groups that are sighted incidentally by mine site personnel and any caribou groups that are known to Environment staff to be on the mine site. As well, caribou ground based behavior observations are conducted by DDMI Environment staff while conducting far field monitoring activities if there is presence of caribou".
		In the Migration Patterns Section (pg. 68), Diavik states that "Applying the principles of adaptive management, collared caribou movements to assess this prediction should no longer be monitored".	Diavik should propose a way they will adapt migration/movement monitoring so that they can continue to compare the current state of the	Adaptive management is used to make changes to monitoring programs and mitigation measure, where warranted. This includes

		Section 12.1 (b) of the EA states that "The actual performance of the project shall be compared to results predicted".	environment at Diavik to original Project predictions, as required by the EA. Diavik should not stop monitoring caribou movements.	removal of specific monitoring that is proven ineffective or no longer warranted based on actual field results. DDMI does not intend to cease monitoring of caribou movements; however, the deflection analysis component has been removed from the monitoring program. Instead of continuing the deflection analysis, DDMI has completed Zone of Influence (ZOI) monitoring, analyses, which contributes to understanding cumulative effects to caribou will report seasonal spring and autumn range attributes (area, centroid and fidelity) for the Bathurst caribou herd based on collar data, which informs on the broad –scale ecology of the herd. The EER predictions indicated 60% (6 of 10 paths) of caribou post-development would move east around Lac de Gras and 17 years of monitoring results indicate overall 43% do. DDMI believes there is little value in continuing this deflection monitoring if the long-term results do not indicate a strong departure from predictions

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				and or an ecological consequence, such as fragmentation of the herd. As well in this case, the deflection analysis does not inform on mitigation effectiveness so results will not lead to changes in how the Mine operates. Therefore, DDMI is of the opinion there is minimal value to continue evaluating this prediction.
		The Grizzly Bear section (pg. 77) (and the Executive Summary) includes the phrase 'stable and increasing', regarding grizzly populations. It is unclear if the grizzly bear population has remained the same (i.e. is stable), or if it has increased.	It is recommended that Diavik revise this statement to be clear.	DDMI has revised this statement to "stable to increasing" (page 80).
7	A note on Adaptive Management and Environmental Monitoring at Diavik	EMAB has noted that Diavik has decided to terminate entire monitoring components in the WMP and EAQMP using the justification of adaptive management. Recent examples include decisions by Diavik to remove TSP monitoring from the EAQMP and to remove Caribou Deflection monitoring from the WMP. Diavik did not consult with Parties to the EA, EMAB or members of the Aboriginal Peoples about removal of these monitoring components. EMAB believes Diavik is misusing the term 'adaptive management' as a justification to terminate these monitoring components, and that this approach goes against the monitoring requirements in the EA. The EA sets out the requirements for ongoing environmental monitoring in section 7. It describes the types of activities required for each program, the required components, reporting, review and Aboriginal community involvement in relation to the		

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		CSR conclusions and Diavik's Commitments. Notably it requires monitoring in relation to the Comprehensive Study Report conclusions and Diavik's commitments. The definition of adaptive management that Diavik has included in the EAAR is "a systematic way of learning from monitoring results or management actions with the intent to improve operating or management practices" (2019 EAAR, pg. viii). In the context of the EA, adaptive management can be used to improve monitoring while continuing to meet all the requirements and obligations for monitoring. It cannot be used to simply remove or terminate monitoring unilaterally.		
8	Traditional Knowledge	Appendix III lists the TK panel recommendations from September 2019, but it does not include Diavik's responses or indicate how Diavik will incorporate the recommendations.	In accordance with the EA section 12.1 (c-x), Diavik should include details about concerns raised by the Panel, Diavik's responses to the recommendations, and details about how recommendations were implemented.	DDMI responses to TK Panel recommendations are provided in the subsequent TK sessions, in each annual TK report, and as an appendix of the EAAR. DDMI Responses to 2018 TK Panel Session 11 are included in Appendix III for the 2019 EAAR as well as the 2019 TK Panel Session 12 recommendations. DDMI responses to Session 12 will be provided at the next TK session.
9	Summary of Public Concerns and Responses to Public Concerns	Section 4 of the 2019 EAAR lists dates and locations of community engagements.	In accordance with the EA section 12.1 (c-x), Diavik should include summaries about what was discussed at these engagements, including comments raising concerns, and Diavik's responses.	DDMI will endeavour to provide additional details in future iterations of the EAAR.
		Section 4 of the 2019 EAAR states that "There were no direct communications or letters expressing	It is recommended that Diavik revise this statement to be accurate.	DDMI respectfully disagrees with EMAB's view on this matter. DDMI

		concerns from the public about the mine or its operations during 2019". EMAB finds this statement misleading. As an example, there is plenty of correspondence on the MVEIRB and WLWB public registries that include community concerns about mine operations (e.g. in relation to the PK to Pits hearings).		notes that EMAB acts as an oversight board, similar to the role of a regulator. DDMI notes that there were no direct communications or letters from the public expressing concerns about Diavik operations in 2019. The PKMW is not reflective of present operations; rather it was an Environmental Assessment on a proposed new project.
10	Operational Activities and Compliance	In accordance with the EA section 12.1 (c-v), Diavik should include a comprehensive summary of operational activities planned for next year. In EMAB's view, the statement that "Most of these activities will be repeated or continue to advance in 2019" (2019 Draft EAAR, pg. 92) is not comprehensive reporting of what will occur next year.	Diavik should indicate *specifically* which operational activities will be ongoing throughout 2020, and identify any new operational activities that will begin in 2020.	DDMI has revised the section in the report to be clearer on which activities occurred in 2019 and which are planned for 2020 (pages 97-99 of the 2019 EAAR).

RioTinto

2019 Environmental Agreement Annual Report

Diavik Diamond Mines (2012) Inc.

Document #: ENVI-1099 -0820 R0

Published: 16 September 2020

Executive Summary

The Diavik diamond mine is located on the East Island of Lac de Gras, in Canada's Northwest Territories, approximately 300 kilometers northeast of the capital city, Yellowknife. Diavik signed an Environmental Agreement (the Agreement) with five (5) Aboriginal organizations and the federal and territorial governments in 2000. The Agreement says what Diavik is to do to protect the environment while operating the mine. There was also an Environmental Monitoring Advisory Board (EMAB) formed as part of the Agreement; the Board is a public watchdog of the regulatory process and the implementation of the Agreement. The Diavik diamond mine was in its seventeenth (17^{th}) year of operations during 2019. Mining at A21 pipe (mineral deposit) commenced 2018 and continued in 2019. Underground mining continued at A154 and A418 pipes.

This report talks about the results of Diavik's environmental monitoring and management programs during 2019. Copies of the reports listed can be found in the EMAB registry (in their office, or on-line library) or the Wek'èezhìi Land and Water Board public registry.

Summary of 2019 Environmental Activities

Mine Footprint

In 2019, the Mine footprint increased by 0.09 square kilometers. The total loss of terrestrial and aquatic habitats to date from Diavik mining activities (11.19 square kilometers) is less than that predicted in the original Environmental Assessment for the Diavik Diamond Mine Project.

Re-vegetation

In 2004, Diavik started doing research on ways to help plants grow back after the mine closes. This research was finished in 2017. The goals were to determine: how best to grow plants from seeds, how effective different planting methods are on plant growth and which conditions improve plant growth over time. The research looked at if it is good to use different planting techniques in patches around the mine site at closure, as this is something that has worked well for other large sites. This work also included more monitoring of the research plots from 2004, to see how well they were doing over time. A final report was completed in 2018 with results considered as part of the latest version of Diavik's Closure and Reclamation Plan (Version 4.1).

Wildlife

Caribou monitoring continued to focus on behavioural observations (watching caribou to study their reaction to mining or other activities) when caribou were present in the study area. Movement patterns for the northern Bathurst caribou migration support the idea that the northern migration route to the west or east side of Lac de Gras is influenced by their location on the winter range. When compared to the prediction that caribou would move east of the lake in fall, the results for 2018 differ from this prediction and more collared caribou have been moving west around Lac de Gras for the

southern migration since 2011. Caribou aerial surveys were not required or completed in 2019. Diavik is waiting for recommendations and direction from the Zone of Influence Technical Task Group of Department of Environment and Natural Resources of the Government of the Northwest Territories for guidelines on future caribou aerial surveys. There were no caribou deaths related to the mine in 2019 and no herding events were done.

Wolverine, grizzly bears and falcons continue to be present in the mine area. Incidental observations are recorded to track the number of times a species is seen on site, including if they are using any of the mine buildings for denning or nesting. There were no wolverine or peregrine falcons found dead on site during 2019. Regional monitoring programs are also conducted in partnership with the Government of the Northwest Territories and other mines. The most recent grizzly bear hair snagging DNA study was conducted during 2017 and results showed that there have been no negative impacts on the regional population of grizzly bears in the Slave Geological Province (i.e. grizzly bear populations are stable and increasing) due to the Diavik mine.

Vegetation, Dust and Air Quality

Snow samples are taken every spring and they are melted to test for the amount of dust on the snow and the type and amount of chemicals in that dust. Dust particles are also captured in collectors and checked to see if there are patterns in the amount and location of dust from the mine. During 2019, the amount of dust was generally less than in 2018. As expected, there was less dust seen at sites further from the mine. The level of chemicals within the dust-covered snow remained below Water License levels and were generally lower than those recorded in 2018. Permanent Vegetation Plots and a lichen monitoring study are checked every five (5) years. They were last done in 2016 and showed reduced levels of dust on vegetation.

In 2019, a total of 43 million litres of diesel were used to operate the mine site.

Water and Fish

Diavik continued to do the Aquatic Effects Monitoring Program (AEMP) and onsite Surveillance Network Program (SNP) monitoring in 2019. The AEMP studies different parts of the lake in different years in order to identify possible effects to Lac de Gras from mining activities. The types of samples taken close to the mine (near and mid-field stations) and far from the mine (far-field stations) in 2019 included water chemistry (quality) and nutrients, and plankton (tiny plants and animals in the water - amount and type), and fish. Traditional Knowledge (TK) studies for the AEMP did not take place in 2019; however, the results of both the fish inspection and water tests for the 2018 AEMP TK Study found that the scientific analysis supported observations made by TK holders that the present status of the fish and water in Lac de Gras is good.

Changes to the lake are mostly caused by an increase in nutrients from the groundwater and blasting. Diavik tries to reduce the amount of nutrients that reach Lac de Gras by using blasting controls, careful selection of blasting materials as well as water management and treatment.

Community Engagement/Traditional Knowledge

Diavik values opportunities to share updates on environmental monitoring and closure planning progress with community members. Diavik works with each Participation Agreement (PA) organization to try to determine a suitable way and time to carry out such events. A summary of Diavik's engagement about the environment with the PA community organizations during 2019 is provided in this Report.

Diavik also tries to bring community members to the mine site so that they can see the mine and observe the surrounding environment with their own eyes. While it is impossible to bring everyone to site, the hope is that those who have been involved share their experience with others back home in the community.

Diavik has a TK Panel with a primary focus of considering and incorporating Traditional Knowledge into mine closure planning. The TK Panel's focus in 2019 was options for closure of the mine pits.

New Technologies & Energy Efficiency

There are four (4) wind turbines that operate at the Diavik mine, and staff continued to make the most of the efficiency of these turbines throughout the year. The wind turbines offset 4 million litres of diesel fuel use and approximately 12,000 tonnes of emissions (CO_2e) in 2019. The turbines have flashing lights to help deter wildlife and reduce bird strikes from the rotating blades. Additionally, approximately 178,963 litres of waste oil was collected to be used in the waste oil boiler during 2019. Since it was commissioned in 2014, a total of over 1.3 million litres of waste oil has been burned to create heat, rather than having to ship it off-site.

In 2018, Diavik changed how the Process Plant operates. The Plant removes diamonds from kimberlite rock, and the rock ends up as either a dry coarse sand or a wetter fine sand. The Plant used to make more fine than coarse sand, but the fine sand is harder to deal with at closure. Diavik tested new technology before making this change; the positive results allowed Diavik to continue to use this method in 2019.

Compliance and EMAB

There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2019. The 2018 Environmental Agreement Annual Report was deemed to be satisfactory by the Deputy Minister of the Government of Northwest Territories, Environment and Natural Resources on October 18, 2019. A copy of the Deputy Minister's letter on the 2018 Environmental Agreement Annual Report is provided in Appendix I.

The Environmental Monitoring Advisory Board and Diavik exchanged letters relating to topics such as the budget, Traditional Knowledge and the TK Panel, as well as reviews of various environmental monitoring programs.

Thank you/Marsi Cho/Masi Cho/Quana to the Kitikmeot Inuit Association, Tłı̨chǫ Government, Yellowknives Dene First Nation, Łutsel K'e Dene First Nation and the North Slave Métis Alliance for the efforts of their staff, businesses, and individual members who worked with Diavik staff in 2019. The continued support of Diavik's Participation Agreement partners helps to make sure that environmental impacts are minimized and our resources are used wisely.

Atanguyat Naitumik Uqauhiit

Diavik-kut piniqutikhanik uyaraktaqvik iniqaqtut East Island-mi Lac de Gras-ilagani, Kanataup Nunatiagani, qanituani 300 kilaamitanik tunungata kivaliqhiani kavamaqaqviup, Yalumaip. Diavik-kut sainiqhihimayut Avatiliqinikut Agiqatiriigunmik (Agiqatiriigut) talimalu Nunaqaqaqtut timiuyut kanatamilu ukiuqtaqtumilu kavamaiyut 2000-mi. Agiqatiriigut uqaqtut Diavik-kut munariyariaqaqtaat avatauyuq uyaraktaqtilugit. Piqaqmiyuqlu Avatauyumik Amirinigagut Ihumakhaqhiuqtit Katimayinik (EMAB) hatqiqhimayut ilagiyaanit Agiqatiriigutip; Katimayit inuknit munaqhiyi maliruagakhanik pigiarutinik atuliqnigagulu Agiqatiriigutip. Diavik-kut piniqutikhanik uyaraktaqvia saivatiigani (17) ukiugani uyaraktaqviuyut 2019-mi. Uyaraktaqvik A21-mi (uyaraktaakhat) atuliqhimayut 2018-mi atuqhimaaqhunilu 2019-mi. Nunap iluani uyaraktaqnit atuqhimaaqtuq A154-mi A518-milu uyaraktaakhani.

Una unipkaaq uqauhiqaqtut qanuriliniginik Diavik-kut avatauyumik amirinigagut munarijutiniklu havaanik atuqtilugit 2019-mi. Ajikutait unipkaat titiraqhimayut naniyaulaaqtut EMAB-mi titiraqaqviani (titiraqviani, qaritauyamiluniit titiraqaqviani) Wek'èezhìi-kuluniit Nunalikiyit Immaliqiyit Katimayit inuknit titiraqaqviani.

Naitumik Uqauhiq 2019-mi Avatiliqinikut Hulijutinik

Uyaraktaqviup Inigiya

2019-mi, Uyaraktaqviup inigiyaa agikligiaqhimayuq 0.09 avataagut kilaamiitamik. Atautimut ahiuniginik nunami immaqmilu nunagiyauyut ublumimut Diavik-kut uyaraktaqviup hulijutainit (11.19 avataagut kilaamiitanik) mikitqiyaq nalautaagauyumit hivuani Avatauyumik Ilituqhaqniganik Diavik-kut Piniqutikhanik Uyaraktaqviup Havaami.

Nautiqtuiniq

2004-mi, Diavik-kut ilituqhailiqhimayut qanuq ikayuriagani nautiat naufaariagani kiguani uyaraktaqviuyuq umikpat. Una ilituqhainiq iniqhimayut 2017-mi. Iniqtirumayauyut ukua naunairiagani: qanuq nakuuniqhamik naupkaiyaagani nautiakhanit, qanuq nakurutauniginik aalatqiit nautiqtuijutit nauvalianigini qanuriligaagalu ihuaqhijutauva nauvalianigini ukiuni. Ilituqhainiq nainaiyautauyuq naamakmagaa aturiagani aalatqiinik nautiqtuijutinik ilagini nunani haniani uyaraktaqviup umikpat, ilaa una aulaniqatiaqmat ahiini agitqiyanik igluqpaqaqvikni. Una havaaq ilaqaqtuqlu amigaitqiyanik amirijutinik ilituqhaiviuyuni nunani 2004-mit, naunairiagani qanurilivalianiginik ukiuni. Kiguliqmik unipkaaq iniqhimayut 2018-mi qanuriliniginik ihumagiyaunigit ilagiyaagani kiguliuq titiraqnigata Diavik-kut Umiktiqnigagut Nunalu Utiqtifaaqnigagut Ilitquhianut Upalugaiyaunmi (Titirauhiq 4.1-mi).

Uumayut

Tuktuut amirinigit qanuriliuqpalianiginik tautuktauyut (qungiaqhugit tuktuut ilituqhariagani qanuriliuruhiit uyaraktaqniqmit ahiinikluniit hulijutinit) tuktuut talvaniiliraagata ilituqhaqvikmi nunami. Hagulugaaqnigit ukiuqtaqtumi Qigaup tuuktuit ataaqnigit ikayuqtut ihumagiyauniganik ukiuqtaqtumut apqutaat ualiqhianut kivaliqhianuluniit Lac de Gras-mit pijutiqaqtut inigiyaanit ukiumi nunagiyaani. Naunaiyaraagat nalautaarut tuktuut nuuniaqniginik kivaliqhianut tattip ukiakhami, qanurilinigit 2018-mi aalagayut uumanga nalautaagamit amigaitqiyalu quguhiniqtautilgit tuktuut nuuniaqniginik kivaliqhianut tattip haniani Lac de Gras-mi hivuraanut ataaqniginik 2011-mit. Tuktuut tikmiakut naunaiyaqnigit

aturiaqagitut iniqhimagituluniit 2019-mi. Diavik-kut utaqikmata atuliquyauyunik turaaqvikhaniklu Inigiyauyut Aktuqnigani Nutauniqhanik Havaakhitauhimayuq ukunani Havakviuyumi Avatauyumi Nunamilu Ihuaqutiliqiyit Kavamanit Nunatiami maliruakhanik hivunikhamik tuktuut tikmiakut naunaiyaqniginik. Tuktuunik tuquyuqagituq uyaraktaqniqmit 2019-mi qimalatigitulu amihuaqhuknik talvuuna.

Qalviit, akhait, kilgaviilu talvaniiginaqtut uyaraktaqvikmi. Qaguguraagat takuyaunigit titiraqtauvakut naunairiagani qafiiqtuqhugu uumayuq takuyauniganik igluqpaqaqvikmi, atuqtuqaqmagaaluniit kitunikliqaa uyaraktaqvikmi igluqpaknik hitiqaqviulutik maniqaqviulutikluniit ivaviuyunik. Qalviknik kilgavikniklunit nanihigiyut tuquhimayunik igluqpaqaqvikmi atuqtilugu 2019-mi ukiuq. Nunami amirinigagut havaat havaariyauyulu ikayuqtiqaqhutik Kavamanik Nunatiami ahiinilu uyaraktaqviknik. Nutauniqhaq akhait hiaginik ahivaijutinik DNA-ginit ilituqhautimik atuqhimayut 2017-mi ukiumi qanurilinigilu nalunairutauyut piqaginiganik ihuitunik aktuqniginik nunami amigainigini akhait Slave-mi Nunagiyauyumi (ilaa akhait amigainigini naamainaqtuq amigaiqpaliavlutiklu) pijutauyunik Diavik-kut uyaraktaqvianit.

Nautiavaluit, Hiuravaluit Hilaplu Halumaniganik

Apunmik naunaiyagakhanik pihimayut upingaaraagat auktuqtitauvlutik ilituqhariagani qanuraaluk hiuraqaqniganik aputip qanuriniginiklu qanuraaluklu halumailruqaqniginik hiuqaap. Hiuravaluit katitigaiyulu katitirutinut naunaiyaqtauvlutiklu pijutauginaqtunik qanuraaluk humilu hiuraqaqniganik uyaraktaqvikmit. 2019-mi, qanuraaluk hiuraqaqniga mikitqiyauginaqtuq 2018-mit. Nahuriyaunigani, hiuraqaqpalaagitut inigiyauyuni ugahiktuaniituni uyaraktaqviup. Qanuraaluk halumailruqaqnigit hiuraqaqnigini aputip aulainaqtut mikitqiyaanik Immaqmik Aturiagani Laisiuyumi qanurinikhainit mikitqiyauvlutiklu ukunanga titiraqtauhimayunik 2018-mi. Nauhimaginaqtukhanik Nunani tuktuulu niqainik amiriyauniganik ilituqhaut naunaiyaqtauvaktut talimat ukiuq naatkagata. Kiguliqmi pihimayut 2016-mi takuupkaivlutiklu mikitqiyanik hiuraqaqniginik nautiat. 2019-mi, atautimut 43 milian liitanik uqhuqyuanik atuqhimayut aulanigani uyaraqtaqvikmi igluqpaqaqvikmi.

Immavaluit Iqaluilu

Diavik-kut atuqhimaaqtut Immavaluit Aktuqniginik Amirijutinik Havaamik (AEMP) igluqpaqaqvikmilu Tautuinaqniginiklu Havaqatiriiktunik Havaami (SNP) amirinigagut 2019-mi. AEMP-mi ilituqhautit aalanik ilaginit tattip aalatqiini ukiuni tikuaqhiyaagani aktuqnirilaaqtainik Lac de Gras-mik ugahiktianiklu uyaraktaqvikmi hulijutainit. Qanurituunigit naunaiyagakhat pihimayut qanituanit uyaraktaqviup (haniani akunganilu havakviuyut) ugahiktuanilu uyaraktaqviup (ugahiktut havakviuyut) 2019-mi ilaqaqtut immaqmi halumailruvaluit (halumanigit) nauvaalirutikhat, nauninuilu (mikiyut nautiat uumayulu immaqmi – amigainigit qanurituunigilu), iqaluilu. Igilraat Qauyimayuait (TK) ilituqhautit AEMP-mik atuqhimagitut 2019-mi; kihiani, qanurilinigit tamaknik Iqaluit ihivriuqniginik immaqniklu naunaiyautinik 2018-mi AEMP-mi TK-mik Ilituqhaut iliturivauyut naunaiyautit ilituqhaqniginik ikayuutauniginik takuhimayainik TK-nik tigumiaqtinit taja qanuriniga iqaluit immavaluilu Lac da Gras-mi nakuuniginik.

Aalaguqnigit tattit pijutauluaqtut amigaiqpalianiginit nauvaalirutinit nunami immaqnit qaraqtitautinilu. Diavik-kut mikhinahuaginaqtait nauvaalirutikhat tuutpaliayut Lac de Gras-mut atuqhutik qagaqtitautit munarinigagut, qayagilugit tikuaqtaunigit qaraqtitautinik hanahimayut immaqmiklu munariniganik halumaqtiqnigagulu.

Nunagiyauyuq Upipkaqniganik / Igilraat Qauyimayainik

Diavik-kut ihumagiyaqaqtut atuqtakhanik uqauhiriyagani nutauniqhat avatauyumik amirinigagut umiktirutiniklu upalugaiyautinut havaamik nunagiyauyumi ilauyunik. Diavik-kut havaqatiqaqtut atuni Ilaunigagut Agiqatiriigunmi (PA) timiuyumik naunaiyariagani ihuaqtumik pigiarutikhamik hunauliqalu havaariyaagani ukua hulivikhat. Naitumik uqauhiit Diavik-kut upipkaijutaanik avatauyumik PA-milu nunagiyauyumi timiuyut 2019-mi pipkagauyut uvani Unipkaami.

Diavik-kut aquipkanahuaqpaktut nunagiyauyumit ilauyunik uyaraktaqvikmut takuyaagani uyaraktaqvikmi ihivriuqriaganilu haniani avatauyumik nanminik iikmigut. Ayuqnaraluaqtilugu aquipkariagani tamainik igluqpaqaqvikmut, nahuriyauyuq ukua ilauhimayut uqariagani atuqhimayamiknik aalanut agilramikni nunagiyauyumi.

Diavik-kut TK-nik Naalaktiqaqtut ihumagiyaqaqluaqtunik ilaliutiniginiklu Igilraat Qauyimayainik uyaraktaqvikmik umikpalianigagut upalugaiyautimi. TK-nik Naalaktit ihumagiluaqtait 2019-mi atuqtakhanik umiktiqnigani uyaraktaqvikmi uyaraktaqviuyunik.

Nunauniqhat Aulajutiniklu Nakurutauniginik

Piqaqtuq hitamanik anurituutinik alruyaqtuutinik Diavikmi uyaraktaqvikmi, havaktut nakuuniqhanik ihuaqutigiyaagani ukua anurituutit atuqnigani ukiup. Anurituutit atugijutauyut 4.1-milian liitamik uqhuqyuanik atuqtauyunik qanituanilu 11-tausit tonnes-mik puyuqnik (CO_2e) 2019-mi. Anurituutit qavlagaqtaqtunik quliqaqtut qimalatiyaagani uumayut ikikliyaaganilu tikmijanik apuutiyunik kaiyainut. Ilagiarut, qanituani 178-tausit 963 liitanik iqagunik uqhuqyuanik katitiqtauhimayut atuqtauyaagani iqagunik uqhuqyuanik ikulaaqtitauhimayut unaqutigiyaagani uhiyaugitaagani ahianut igluqpaqaqviup.

2018-mi aalaguqhiyut qanuq Uyaqiqivik aulaniganik. Uyaqiqivik ahivaivaktut piniqutikhanik uyaraktaanit, uyaqalu iliyauvaktut paniumayumik uyaralianik kinipayunikluniit hiuralianik. Uyaqiqivik pivaktuugaluaq amigaitqiyanik hiuralianik uyaraliagugitunik, kihiani hiuraliaq ayuqnatqiyaukmat qanuriliuriami umiktiliqat. Diavik-kut ilituqhaiyut nutauniqhanik una aalaguriaqtinagu; nakuuyut qanurilinigit pijutauyut Diavik-kunit atuqhimariagani una havauhiq 2019-mi.

Malitiaqniq EMAB-kulu

Piqagituq ukunuga tuhaumajutinik titiqanikluniit ihumaluutauyunik inuknit uyaraktaqvikmi aulanigaguluniit 2019-mi. 2018-mi Avatiliqinikut Agiqatiriigut Aipagutuaraagat Unipkaamik naamagiyauyumik Tuuklianit Ministauyuup Kavamani Nunatiamit, Avatauyumik Nunamiutaniklu Ihuaqutinik October 18-mi 2019-mi. Ajikutaa Tuukliata Ministauyuup titiraqtaanik 2018-mi Avatiliqinikut Agiqatiriigutip Aipagutuaraagat Unipkaap pipkagauyut Uiguani A-mi.

Avatauyumik Amirinigagut Ihumakhaqhiuqtit Katimayit Diavik-kulu titiqijutiyut pijutinik ukuniga ukiumi atuqtukhanik maniknik, Igilraat Qauyimayainik TK-niklu Naalaktinik, ihivriuqniginiklu aalatqiit avatauyumik amirinigagut havaat.

Thank you/Marsi Cho/Masi Cho/Quana Qitiqmiuni Inuit Katimayiinik, Tłįchǫ-kut Kavamaanit, Yalunaimi Itqiliqnit, Łutsel K'e-kut Itqiliqnit, Tununganilu Qavlunaaqanit akhuurutainik havaktimiknit, manikhaqhiurutainit, inuknilu ilauyunit havaqatiqaqtunik Diavik-kuni havaktunik 2019-mi. Ikayuqtuqhimaaqniga Diavik-kut Ilaunigagut Agiqatiriigunmik ikayuqtit avatauyumik aktuqnigit mikiniqhauyaagani ihuaqutivulu atuqtauyaagani ihuaqniqhakut.

K’àodèe Godı Nɻhtł’è Nek’ǫ̀ą - 2019

Diavik sǫǫ̀mbakweè degoo gha sǫǫ̀mbak’è Ek’atı̨ k’e East Island gòyeh k’e gòɔǫ. Canada wek’èezhìı Edzanèk’e Sǫǫ̀mbak’è kǫ̀godeè gòɔǫ gots’ǫ taıkw’eènǫ echɻ, chɻk’è eyıts’ǫ k’àbatsǫ̀ ts’ǫnèe gòɔǫ hǫt’e. 2000 ekò Diavik, Dǫsǫǫ̀hłɻ̨ sɻlài hàgeèɔaa, ɻdaà dèek’àowodeè eyıts’ǫ Edzanèè dèek’àowo xè Dè Gomǫǫ̀ Ts̨gowıı Ch’à Nàowoò (EA) k’e edıizì dek’enèyɻ̨tł’è ɻlè. Eyìı nàowo gèhtsɻ̨ sìı Diavik eyìı sǫǫ̀mbak’è gòɔǫǫ k’e eghàlageda nɻdè dè wemǫǫ̀ gòɔǫǫ sìı ts̨gowıı ts’à gıxoehdı ha hanì dek’eèhtł’è. Eyìı wexè Dè Gomǫǫ̀ Wexoedıı K’e Dèhkw’ee (EMAB) gǫ̀hłı, nàowo hòlɻ̨ xè wheɔǫ hǫt’e, wek’e dǫ dèhkw’ee sìı gonèk’e kehogıihdıı dǫǫ̀ agɻ̨t’e, dàanì wenàowoò wheɔǫǫ k’ę̀ę̀ gıghàlada eyıts’ǫ EA wenàowoò ek’èzhee. 2019 k’e Diavik sǫǫ̀mbakweè degoo gha sǫǫ̀mbak’è gòɔǫǫ sìı hoònǫ-daà-łǫ̀hdɻ (17th) xo gots’ǫ gık’e eghàlada hǫt’e. A21 pıpe (sǫǫ̀mbakweè gòɔǫǫ) k’è kèhogɻ̨̀hdè hǫt’e, eyıts’ǫ 2019 k’e ɻłaà hagot’ɻ. A154 eyıts’ǫ A418 pıpe gòlaa k’è ɻłaà dègotł’a kwe xàgele k’e eghàlageda.

Dıı godı nɻhtł’è k’e Diavik, 2019 k’e dè gomǫǫ̀ xogıihdı eyıts’ǫ asìı k’e eghàlagɻ̨̀dàa sìı wek’e dek’eèhtł’è. Wegodiì nɻhtł’è Dè Gomǫǫ̀ Wexoedıı K’e Dèhkw’ee (EMAB) gınɻhtł’èkǫ̀ whela hǫt’e, (gınɻhtł’èkǫ̀ hanì-le-dè on-lıne library k’e dek’eèhtł’è) hanì-le-dè Wek’èezhìı Dèe eyıts’ǫ Tı Nàowoò k’e Dèhkw’ee public registry k’e dek’eèhtł’è.

2019 Dè Gomǫǫ̀ k’e Eghàladaa Wegodiì Nek’ǫ̀a

Sǫǫ̀mbak’è Wekeè k’è Gòlaa

2019 k’e, Sǫǫ̀mbak’è wekeè k’è gòlaa gedıı sìı 0.09 square kilometres t’à ɻdoò adzà. Dıidzę̀ę̀ ts’ǫ̀ Dıavık sǫǫ̀mbak’è gòɔǫǫ k’e la t’à nàdahoowo t’à tıts’aàdìı nàdèe k’è gòlaa ɻlèe sìı whìle agòdzà. Hazǫǫ̀ t’à dè k’e eyıts’ǫ tı yìı nàdèe k’è whìle agòdzàa sìı dakwełǫ̀ǫ̀ Diavik Diamond Mine Project xèhoòwıı gha dè gomǫǫ̀ ghǫ nadąą̀ gogɻ̨̀deè ekò eyìı nahk’e dek’aɔı̨ hǫt’e.

Dè Nagoehsee

2004 ekò Diavik wedaètı̨ gha dàanì dè nagoehseè agele gha gıxàetaa xèhogɻ̨̀hdè ɻlè. 2017 k’e eyìı wenahǫ̀t’e. Dàanì nɻdè ɻt’ǫ̀ą wejìì gots’ǫ denahk’e nezɻ̨̀ dehseè adle ha, eładɻ̨̀ dè goyìı nègele t’à nezɻ̨̀ dehseè ade ha eyıts’ǫ whaà hoowo tł’axǫǫ̀ dàgǫ̀ht’e hòɔǫǫ t’à deɔǫ̀ nezɻ̨̀ dehsheè ade ha. Sǫǫ̀mbak’è wedaètɻ̨̀ k’è wemǫǫ̀ dè gǫchà-lea k’e wejìì eładɻ̨̀ k’ę̀ę̀ dè k’e nègele nɻdè asɻ̨̀ nezɻ-lì gha gıghàɻdà, eyìı-le sǫǫ̀mbak’è gǫǫtsàa gòlaa k’è hagɻ̨̀làa t’à nezɻ̨̀ agòdzà ɻlè. Eyìı weghàlada wexè 2008 gots’ǫ dè gǫchà-lea wexàetaa sìı k’achɻ wexoedìı ha hǫt’e, wek’e gòɻɔàa tł’axǫǫ̀ asɻ̨̀ ɻt’ǫ̀ą nezɻ̨̀ dehshǫ lì gha aget’ɻ. 2018 ekò nǫde wegodiì nɻhtł’è hòlɻ̨ ɻlè, eyìı wexè adlàa t’à wegodiì nǫdè wheɔǫǫ ghaıtà, wet’à Diavik wedaetɻ̨̀ eyıts’ǫ dè sıìnagodlee (Versıon 4.1) k’e eghàladaà ade ha.

Tıts’aàdìı

Ekwǫ̀ ɻłaà wexoedı hǫt’e, dè wexàetaa k’e aget’ɻ nɻdè dàanì k’ehogeɔaa gha gıxoedı (sǫǫ̀mbak’è gòɔǫǫ eyıts’ǫ dǫ eghàlagìıdèe k’è gòla gà aget’ɻ nɻdè dàget’ɻ̨̀ gıghàeda). Hozìı goekwǫ̀ nadeeɔàa sìı xok’e edɻ̨̀ nàgedèe weghàà dąą̀ ts’ǫnèe hanì-le-dè k’àbatsǫ̀ ts’ǫnèe Ek’atì xa nadeeɔà hǫǫwǫ.

Xat’ǫ̀ k’e ekwǫ̀ sazı ts’ǫnèe Ek’atì wexa nadeeɔà ha hodıı t’à nadąą̀ xàyatıı sìı 2018 wegodıì xèht’eè nıìle eyıts’ǫ satsǫ̀ ekwǫ̀ gık’o k’e whelaa ghàà 2011 gots’ǫ ekwǫ̀ deɔǫ̀atłǫ sazı ts’ǫ̀ nadeeɔàa sìı Ek’atì wemǫǫ̀ dąą̀ ts’ǫ̀ nadeeɔà hǫt’e. Nıhtł’èk’et’aa t’à gınıhtł’èìchı ha hodìì-le, hanì-le-dè 2019 k’e hadlà-le. Diavik, nàowo hołèe ha eyıts’ǫ ayìı dàgele gha dè wek’e asagot’ıı Technical Task Group of Department of Environment and Natural Resources of the Government of the Northwest Territories, ıdaà nıthtł’èk’et’aa t’à ekwǫ̀ gınıhtł’èìchı gha yatı danageèhɔı. 2019 k’e sǫǫ̀mbak’è gòɔǫǫ t’à ekwǫ̀ ełaıwo whìle eyıts’ǫ ekwǫ̀ t’asıį̀ nagıdeezı adlàa whìle.

Nǫ̀gha, sahcho eyıts’ǫ tatsea ıłaà sǫǫ̀mbak’è gòɔǫ gà aget’ı. ʔıhk’èa asìı wègoat’ıı sìı dek’enègetł’è, hanì-ıdè sǫǫ̀mbak’è gòɔǫǫ asìı hàɔaa wègoèht’į̀ nıdè dek’enègetł’è, ekǫ kǫ̀ gòlaa wenı edeɔǫ gogehtsı hanì-le-dè et’o gehtsı wexè dek’enègeetł’è. 2019 k’e nǫ̀gha eyıts’ǫ tatsea ekǫ ełaıwo wegòt’ǫ whìle. Edzanèè Dèek’àowo eyıts’ǫ sǫǫ̀mbak’è eyìı-le gòlaa gıxè ekǫ nèk’e kehogıihdıı gha ełexè eghàlageda. Sahcho weghàà et’àìkaa t’à nàgehtsį̀ı sìı 2017 k’e DNA gha gıxàeta ılè. Wexàeta t’à Slave Geologıcal Provınce k’e sahcho dàtłǫ gǫ̀hłıı sìı Diavik mıne ts’ıhɔǫ̀ gıxè ładıį̀ agòdzà-le (sahcho dàgeètłǫǫ sìı ıłaà aį̀łı xè netłǫǫ̀ agıdaade) dek’eèhtł’è.

Ɪt’ǫ̀ dehsee, ʔehtł’èe daedıı eyıts’ǫ Nıhts’ı weta Dàgǫ̀ht’e

Edaàhk’ǫ taàt’eè zah gìchı sìı eèhk’ǫ̀ agehɔı, ɔehtł’è dàtłǫ zah k’e at’ıı eyıts’ǫ nàèdı dàhòt’ıı eyıts’ǫ nàèdı dàtłǫ ɔehtł’è weta whelaa gha gık’aehta. ʔehtł’è daedıı nàhtsį̀ı tǫǫ̀ yìı at’ıı sìı gık’aehta, weghàà ɔehtł’è dàtłǫ agot’ı eyıts’ǫ sǫǫ̀mbak’è gòɔǫǫ gots’ǫ ɔehtł’è edıį̀ ts’ǫ̀ at’ı gha gık’aehta. 2019 ghoò k’e ɔehtł’è daedıı sìı 2018 k’aɔį̀ nàgıihtsı. Hanì ha wexats’eehłı k’ę̀ę̀ sǫǫ̀mbak’è ts’ǫ̀ nıwà gòɔǫǫ sìı ɔehtł’è daedıı dek’aɔį̀ adzà. Nàèdı t’à eghàlagedaa zah ka ɔehtł’è daedıı weyìı dàgǫǫwa whetł’ıı sìı Water Lıcense Levels ıłaà wek’aɔį̀ whetł’ı, eyıts’ǫ 2018 wek’aɔį̀ lanì dek’eèhtł’è ılè. Permanent Vegetation Plots eyıts’ǫ adzį̀į̀ wexoedıı wexàetaa sìı sìlài (5) xo taàt’eè gık’aehta. 2016 k’e nǫde gık’aèhtǫ t’à ɪt’ǫ̀ k’e ɔehtł’è daedıı dek’aɔį̀ adzà wègaat’ı.

2019 k’e hazǫǫ̀ t’à diesel tłee (diesel oıl) 43 lemìıyǫǫ̀ litres haàtłǫ t’à sǫǫ̀mbak’è gòɔǫǫ weghàlada hǫt’e.

Tı eyıts’ǫ Łı

Diavik, tı xè ładıį̀ agot’ıı wexoedıı (AEMP) sìı ıłaà gık’e eghàlada eyıts’ǫ 2019 k’e sǫǫ̀mbak’è gòɔǫǫ ekǫ ıłaà kehogıihdıı (SNP) hǫt’e. AEMP, xo eładıį̀ k’e Ek’atì tı whehtǫ eładıį̀ ts’ǫneè gots’ǫ tı xàgeeta, sǫǫ̀mbak’è dǫ eghàlagìıdèe ts’ıhɔǫ̀ edahxǫ Ek’atì xè ładıį̀ agot’ıı gha gıxàeta. 2019 k’e sǫǫ̀mbak’è gòɔǫǫ wegà (wegà gǫǫwà-le asìı nàgehtsį̀ı k’è) eyıts’ǫ wets’ǫ̀ gǫwàa (nıwà asìı nàgehtsį̀ı k’è) gots’ǫ tı gìhchıı sìı tı weta dàgǫ̀ht’e (quality), weta ɪt’ǫ̀ nechà-lea dàtłǫ eyıts’ǫ asìı k’ets’àa dàhòt’ı weta whelaa, eyıts’ǫ weta łı sı xàgeta. AEMP 2019 k’e Whaèhdǫǫ̀ Nàowoò (TK) xàetaa gıxè agòdzà-le; hanìkò 2018 AEMP TK Study gha łı k’ahoòtǫ eyıts’ǫ tı k’ahoòtǫ sìı TK gıts’àdagedıı gıgha wegodıì deghàà wek’ahoòtǫǫ gıgǫ̀hɔǫ t’à dıì łı eyıts’ǫ Ek’atì tı whehtǫǫ xè nezį̀ı hòɔǫ gedı.

Tı xè ładıį̀ agot’ıı sìı dègotì weta asìı nàdee eyıts’ǫ kwe nàek’èe ts’ıhɔǫ̀ asìı deɔǫ̀atłǫ tı ta at’ı hǫt’e. Diavik, asìı dek’aɔį̀ Ek’atì ta at’ı ha hogeèhdzà, kwe nàgehk’èe hogıihdıı t’àa eyıts’ǫ wet’à kwe nàek’èe ek’èts’aòt’ıı t’à aget’ı t’àa eyıts’ǫ tı sìɔıı xè eghàlageda t’à.

Kǫ̀ta xè Eghàlagedaa / Whaèhdǫǫ̀ Nàowoò

Diavik, dè xè gòɔǫǫ dàanì wexoedıı eyıts'ǫ dàanì sǫǫ̀mbak'è wedaètʒ̨ ts'ǫǫ̀hk'e kǫ̀ta dǫ nàdèe xè nadąą̀ gogede gıgha nezʒ̨. Diavik, dǫ xè eghàlagedaa nàowoò (PA) hazǫǫ̀ goxè eghàlageda; dàanì gıghàlada ha; dàht'ee nɻdè agot'ɻ ha wedaànıgedè gha. 2019 k'e Dıavık wegodıì nek'ǫ̀ą k'e dè xè gòɔǫǫ k'e dàanì eghàlageda ha, kǫ̀ta dǫ gıhòɔǫǫ xè eghàlagedaa PA ha sìı dıı godı nek'ǫ̀ą k'e dek'eèhtł'è.

Eyìı xè Diavik, kǫ̀ta gots'ǫ dǫ xè geèhkw'ee sìı sǫǫ̀mbak'è gòɔǫǫ ts'ǫ̀ gogeewa ha k'ehogeɔa, hanì-ɻdè sǫǫ̀mbak'è gòɔǫǫ ghàgeeda ha eyıts'ǫ wemǫǫ̀ dè xè dàgǫ̀ht'ee sìı xàè ededaà t'à gıghàeda ha. Dǫ hazǫǫ̀ ekǫ ts'ǫ̀ gogeewa ha wèhodıì-le hanìkò edahxǫ dǫ ekǫ hogıaɔɻʒ̨ sìı gıxè dàgoat'ʒ̨ sìı wet'à edekǫ̀ta dǫ xè gogedo ha.

Diavik, Whaèhdǫǫ̀ Nàowoò k'e Dèhkw'ee gıts'ǫ, Whaèhdǫǫ̀ Wenàowoò xè sǫǫ̀mbak'è wedaètʒ agele ha eyìı dakwełǫǫ̀ gıdaànıdè ha. 2019 k'e Whaèhdǫǫ̀ Nàowoò k'e Dèhkw'ee sìı dàanì sǫǫ̀mbak'è wedaètʒ gha dakwełǫǫ̀ gıdaànıedè ha hǫt'e.

Nàowo Gòò t'à Eghàlahodaa & Wet'à Deghàà Gahwhee

Nıhts'ı t'à satsǫ̀etłee dɻ gǫ̀hłɻ wet'à Diavik sǫǫ̀mbak'e gòɔǫǫ etłeè agʒ̨ʒ̨hwhǫ. Dǫ gıghàladaa sìı xoghàà denahk'e wet'àhot'ɻʒ̨ gha nezʒ̨ etłeè agʒ̨ʒ̨hwhǫ. Eyìı nɻhts'ı t'à satsǫ̀etłee sìı 2019 k'e 4.1 lemıyǫǫ̀ litres haàtłǫ dek'aɔɻ etłe t'à get'ɻ eyıts'ǫ k'àhdzǫ 11,000 tonnes ło haàtłǫ aɻhda dek'aɔʒ̨ xàekw'e (co2e). Eyìı nɻhts'ı t'à satsǫ̀etłee webeè k'e ek'aàk'ǫǫ naìtł'ʒ̨ dawhelaa wet'à tıts'aàdìı k'e ade ts'à eyıts'ǫ webeè ets'aetł'òo sìı wet'à dek'aɔʒ̨ det'ǫ k'edèe k'e at'ɻ hǫt'e. Eyìı xè 178,963 litres tłe haàtłǫǫ weghàhoòwoo sìı nàgʒ̨ʒ̨htsɻ sìı 2019 k'e tı t'à satsǫ̀etłee dèk'ǫǫ yìı tłe weghàhoòwoo t'à get'ɻ. 2014 k'e la goghàgʒ̨ɔǫ gots'ǫ hazǫǫ̀ t'à 1.3 lemìıyǫǫ̀ lıtres tłe haàtlǫ weghàhoòwoo t'à goyìı gogeèhk'ǫ̀, tłe weghàhoòwoo t'asʒ̨ʒ̨ ts'ǫ̀ naeze ha-le t'à.

2018 k'e Diavik, sǫǫ̀mbakweè xàgelee k'è eładʒ̨ gıghàladaà agʒ̨ʒ̨là. Ekǫ kwe kimberlite weyìı gots'ǫ sǫǫ̀mbakweè xàgelee sìı ewaà ɻghoò whegǫǫ ɔìhłè hanì-le-dè ewaà nechà-lea ɻkw'àh ɔìhłè. Ewaà nechà-lea ɻkw'àh denahk'e gehtsɻ ɻlè hanìkò sǫǫ̀mbak'è wedaètʒ gha nɻdè ewaà nechà-lea ɻkw'àh xè eghàlageda ha denahk'e wehoedıì-le hǫt'e. Diavik, eładʒ̨ʒ̨ nèhogìıɔà wekwe nàowo wegòò geèhdzà ha. Wet'à nezʒ̨ʒ̨ agòdzà t'à Diavik 2019 k'e ɻłaà gıt'àat'ɻ ha gıghàhòt'ǫ.

Ełek'èhot'àa eyıts'ǫ EMAB

2019 k'e sǫǫ̀mbak'è gòɔǫǫ weghǫ, hanì-le-dè dàanì weghàladaa ghǫ dǫ t'asagedıì-le nɻhtł'è sı t'à gıghǫ xàyahtıì-le. 2018 k'e Dè Gòɔǫǫ Nàowoò Xo taàt'e Wegodıì Atł'èe sìı Edzanèk'e Dèek'àowo Deputy Mınıster, Dè Gòɔǫǫ Wexoedıı eyıts'ǫ Asìı Naeshee t'à Hot'ʒ̨ʒ̨ Ehts'ok'eyatıı Zaà 18 k'e gıgha asanì-le. Deputy Mınıster wenɻhtł'è 2018 k'e Dè Gòɔǫǫ Nàowoò ɻdè Appendıx A xè whehchì adlà.

Dè Gòɔǫǫ Wexoedıı k'e Gogedee Dèhkw'ee eyıts'ǫ Diavik, sǫǫ̀mba dàtłǫ t'à eghàlagedaa, Whaèhdǫǫ̀ Nàowoò eyıts'ǫ Whaèhdǫǫ̀ Nàowoò k'e Dèhkw'ee ghǫ ełets'ǫ̀ gʒ̨ʒ̨tł'èe ɻlè, eyıts'ǫ dè wexoedıı hàɔaa ghǫǫ̀geeda eyìı sı wexè.

Dǫ dıı haàtłǫ hàgeèɔaa masìcho gìts’edı: Hotedà ts’ǫǫ̀hk’e - Kıtıkmeot Inuıt Associatıon, Tłı̨chǫ Dèek’àowo, Sǫǫ̀mbak’è Dǫ Dakwełǫǫ̀ Edenèè k’e Nàgedèe, Łìhtsok’è Dakwełǫǫ̀ Edenèè k’e Nàgedèe, Tłı̨chǫ Dakwełǫǫ̀ Edenèè k’e Nàgedèe, eyıts’ǫ Waàk’ǫ̀ą - North Slave Metıs Allıance, gıchekeè goxè eghàlagı̨ı̨dàa, sǫǫ̀mba edegetsı̨ı̨ hàɔaa, eyıts’ǫ 2019 k’e dǫ hazǫǫ̀ Diavik wechekeè xè eghàlagı̨ı̨dàa sìı masìcho gìts’edı. Diavik xè eghàlagedaa Nàowoò (PA) wet’à dǫ ełets’àdıı t’à dè gòɔǫǫ xè dek’aɔı̨ ładı̨ı̨ agodzà eyıts’ǫ dè k’e asìı naeshee sìı nezı̨ı̨ wet’àhot’ı̨ hǫt’e.

Æerehtå'ís Hálî Ts'î Hani Nedúwé

Diavik diamond mine tsamba k'é theæâ sí, Lac de Gras húlye Jadízñ Æedzagh N‡n theæâ sí æeyÿr East Island húlye nu theæâ sí æeyÿr t'a theæâ æat'e, Beghúldesche ts'î yudázé ts'‡n tonona dechÿn hániåtha húk'e theæâ. 2000 núltágh kú, Diavik sôlághe æeåk'éch'a dÿne dédline ts'îæáne xa k'áldé dálî sí xél chu yunághé ts'î níé ts'‡n k'aldhÿr chu jadízñ æedza n‡n ts'î níé ts'‡n k'aldhÿr xél t'at'ú ní hadi xa límashi heåts'î, that'ín yati t'á Environmental Agreement húlye. Æedÿri límashí sí Diavik tsamba k'é theåæâ ghár t'at'ú níé ts'çdhir ch'á yaåni xaæâ sí bek'oréhtå'is, æeyi yeghár æeghálana xa. Æedÿri límashí hálî sí æeyi beghár æedÿri Environmental Monitoring Advisory Board (EMAB) húlye nuhút'âgh, thÿne ts'‡n t'así haåni xa; æedÿri Board sí t'at'ú æerehtå'ís beghár æeghálada xaæâ sí haåni-u, tth'i ní ts'çdhÿr ch'á t'at'ú beghálada xa sni sí æeyi hát'e-u háæâ xa haåni æat'e. Diavik diamond mine tsamba k'é theåæâ, 2019 k'e beghálahdã sí, dû æeåáísdîadhel (17) gháy xa beghálada æat'e. A21 pipe húlye (tthe betagh tsamba hulî) 2018 núltagh k'e beghálada búnídhÿr-u, 2019 k'e æaåø beghálada háæâ. A154 chu A418 níyághe æeyi tth'i æalø beghálada háæâ.

Æedÿri æerehtå'ís sí, 2019 k'e t'at'ú Diavik ní haåni-u, t'at'ú ní hadi yeghálana sí, æeyi ghâ t'e. Æedÿri æerehtå'ís sí, EMAB húlye t'a æerehtå'ís theåa sí (bets'î office theæâ sí æeyÿr-u, tth'i computer yé t'âlási æerehtå'ís neåæî xadúwíle bek'ání, æeyÿr tth'i thela æat'e) æeyÿr thela-u, hat'ele dé, Wek'èezhìi Land and Water Board húlye æeyÿr t'âlási æerehtå'ís neåæî xadúwíle æerehtå'ís theåa sí æeyÿr tth'i thela æat'e.

2019 K'e T'at'ú Ní Badi Beghálahdâ Sí Ghâ Dÿnexél Hadi

Tsamba K'é T'a Ní Theæâ

2019 núltagh k'e tsamba k'é t'a ní k'e theæâ sí, deæãíåyâ æaja 0.09 kilometers húlye háíåyâ t'á. Diavik Diamond Mine Project húlye nút'ágh tthe, tsamba k'é nútágh t'á t'at'ú t'así ts'çdhir xa hunidhÿn bek'aunehtágh hîlé sí æeyi t'at'ú ní ts'î chu tu yághe ts'î t'así æedø æane xa hunidhÿn sí Diavik tsamba k'é theåæâ sí (11.19 square kilometers), æeyi bek'áæõ húle æat'e.

T'ãnch'ay nanelye

2004 kú, Diavik tsamba k'é dárétâ tå'ã dé t'at'ú t'ánchay dánanílye xa sí k'aunetagh húníåthÿr hîlé æat'e. Æedÿri bek'aunetagh sí, 2017 æeyi kú nooť é. Æedÿri t'a hoåé hunidh‡n xa beghálada sí: t'así huneshe beť át'î t'á æedlát'u t'a æaté nezû t'asi neshe-u, tth'i æeåk'éch'a ts'‡n t'ánchây dáníye sí, æedlát'u t'a deæããs nezû neye t'á-u, tth'i æedlát'u háæâ dé t'ánchây deæããs nezû neye æeyi net'ñ. Æedÿri bek'aunetagh sí, tsamba k'é theæâ bedárétâgh tå'ã dé, æeyÿr náré t'at'ú t'ánchây nanelye sí, æedlát'u t'a deæããs nezû dáníye t'á, æeyi t'a net'ñ-u, t'a hurichá sí æeyÿr nezø t'ánchây dánílye búret'î t'á. Æedÿri beghálada sí, 2004 kú t'así neshe xa nílya hîlé sí, dû t'at'ú dáníye sí æeyi tth'i net'î. 2018 núltágh k'e æedÿri ghâ final report húlye nade æerehtå'ís hálî-u,

t’anódhÿr sí benánadé, Diavik bets’î Closure and Reclamation Plan (Version 4.1) húlye æeyi t’a húlæâ sí, bexél ælye xa dé beghâ nánadé.

Ch’âdí

Æetth‡n badi háæâ sí, æeyÿr náré æetth‡n dólî dé æetth‡n t’arát’î sí (tsamba k’é theæâ t’á to æeyÿr nár t’así æeghálada t’á to æetth‡n t’arátî sí æeyi badi) æeyi xa badi. Yudázî ts’î Bathurst caribou húlye æetth‡n t’a ts’‡n dzéréltå’i sí yudázî ts’î t’a ts’‡n dzéréltå’i xa sni, hát’u dzéréltå’i-u ghay k’e t’a ts’‡n dzéréltå’i sí æeyi bet’á Lac de Gras ts’î æetthñze ts’‡n tó nazî ts’‡n tó dzéréltå’i xa bek’órejâ æat’e. Xayt’ás dé æetth‡n æeyi tu theæa ts’î æetthñze ts’‡n æat’î xa dásni hájaile 2018 núltágh k’e, tth’i æetth‡n bek’oth kál bek’e dáthela åâ Lac de Gras ts’î nazî ts’‡n æat’î sayizñ ts’‡n naltå’i ghâ núdhÿr dé, 2011 ts’î hát’î æat’e. 2019 núltágh k’e dzeret’áy t’á æetth‡n hultagh sí, bedí húlí sát’ele t’á hályaile. Jadízñ Æedzagh N‡n Ts’î Níé Ts’‡n K’aldhÿr bechÿlekui Environment and Natural Resources húlye ts’î Zone of Influence Technical Task Group húlye t’at’ú Diavik yunéth haæa dzeret’áy t’á t’at’ú æetth‡n hultágh héni, æeyi xa nóréåæâ æat’e. 2019 k’e tsamba k’é theæâ ts’îæáne æîåágh huli æetth‡n thâidhÿr hûlñle - u, æîåágh huli æetth‡n yuwé níjú hulñle.

Nághaye-u, dleze-u tth’i jíschogh tth’i æeyÿr tsamba k’é theæâ nár búret’î. Æeyÿr nár ch’âdí het’î dé bek’úríltå’is æat’e, æeyi ghár t’aníåt’e k’éneth t’at’i ch’âdí het’ñ sí bek’órejâ xa t’á, tth’i æeyÿr tsamba k’é theæâ køé dáthela sí, æeyi náré bet’ógh níle dé xa tth’i badi. 2019 k’e tsamba k’é háæâ æeyÿr nár nághaye thâidhÿr húlæâ hulñle-u, æîyes æeldél thâidhÿr húlæâ hulñle. Tsamba k’é háæâ æeyÿr benáré Jadízñ Æedzagh N‡n Ts’î Níé Ts’‡n K’aldhÿr æeyi bexél chu, yuæáné tsamba k’é dáthela æeyi tth’i bexél t’así hadi háæâ æat’e. 2017 k’e dleze betth’íghá nálts’í-u, bets’î DNA húlye net’i-u, æeyi beghár æeyÿr South Slave Geological Province húlye náré dleze nádé sí æeyi tsamba k’é theæâ t’á t’asájaile bek’órejâ (t’at’ú æats’edi dleze t’at’ú dániye sárat’ele-u deæáníåt’e æane).

T’anchay Neshe-u, Ts’‡r Dzérédhi-u, tth’i Niåts’i Ts’ejí Dzérédhi T’at’e Sí

Haluka hant’u, yath nálts’í-u, nalghî-u, bet’agh t’aníåt’e ts’‡r hulî net’î-u, t’at’i ts’‡r-u, tth’i æeyi ts’‡r betagh t’at’i náídísåine hulî sí æeyi tth’i net’î. Æeyi beghâåthÿn ts’‡r náåtsi xa t’así dáthela sí, æeyi beyé net’î-u, tsamba k’é theæâ t’at’u ts’‡r t’at’ú dzérédhi-u, t’aníåt’e ts’‡r dzérédhi sí æeyi tth’i hultágh-u badi. 2019 núltagh k’e kú, t’aníåt’e ts’‡r dzérédhi sí yuyágh æajá 2018 núltágh k’e ts’î hultágh ghár xa-u. Tsamba k’é theæâ ch’azî súghá niåtha xa dé, ts’‡r dzeredhi k’áæô æat’e-u hane xa sã hunidhÿn æat’e. Yath k’e ts’‡r nátå’ir sí net’ñ ghár æeyi Water License húlye tu t’á t’î xa æerehtå’ís betå’alchúth sí, æeyi t’aníåt’e xa dúwíle héts’edi æeyi k’áæô æat’e-u, 2018 k’e t’aníåt’e sni-u bek’uréhtå’ís sí, æeyi tth’i k’áæõ æat’e. T’ánchay dánishe chu tthetsñ dánishe chu æeyi bek’áúnetagh sí sôlágh (5) ghay hant’u net’î æat’e. 2016 k’e nade net’ñ æat’e-u, t’aníåt’e ts’‡r bek’e nátå’ir hultágh sí yuyághe æajá æat’e.

2019 núltágh k’e kú harelyø t’á 43 límÿlyõ lígalõ, that’ín yati t’á litres sni si, háníåt’e gÿslín, diesel húlye, bet’áát’ñ, tsamba k’e beghálada xa.

Tu chu Åue chu

2019 núltágh k'e, Diavik æedÿri Aquatic Effects Monitoring Program (AEMP) húlye háåæâ ghár tu yághe t'así dánishe t'arát'e badi æeyi æaåø yeghálana-u, tth'i Surveillance Network Program (SNP) húlye æeyi tth'i æaåø yeghálana. Æeyi AEMP beghár æeghálada sí, æîåágh ghay hant'u Lac de Gras tu theæâ sí, net'î æat'e hat'e húlí, æîåágh ghay k'e t'asízñ net'î-u, æeyÿr ts'î yunedhe ghay dé, æedø ts'ǂn net'î, æeyi beghár tsamba k'é theæâ sí bet'á Lac de Gras ts'çdhir dé xa badi t'á. 2019 núltágh k'e tsamba k'é theæâ ts'ǂn nidhíle (bets'ǂn nedhíle-u, tth'i t'anís ts'ǂn lát'e dáthela) chu netthá ts'î chú tu náåtsî bets'î chemistry (tu t'at'e sí) húlye net'î xa-u, tth'i that'ín yati t'á nutrients sni æeyi chu plankton (te yé ts'î t'así dánechílaze búret'île dániye – t'aníåt'e chu t'at'i chu) húlye æeyi tth'i xa net'ñ – åue tth'i net'ñ. Æedÿri AEMP húlye xa Traditional Knowledge (TK) Study húlye sí 2019 núltágh k'e hályaile: hat'e húlí 2018 núltágh k'e æeyi AEMP TK Study húlye xa åue chu tu chu net'ñ-u t'a dÿne ch'áni k'édórélyâ deni t'arádi ghár xa-u, åue chu tu chu nezø-u sát'ele dádi, æeyi æeåéå t'a æat'e.

Ní túé bet'agh nutrient's húlye yudágh æát'î chu ní nálk'eth æeyi bet'á tu æedø æat'î æat'e. Diavik æeyi ní túé bet'ágh nutrients húlye Lac de Gras yétå'ír k'áæô æane xa yeghálana æat'e-u, ní nák'eth sí, æeyi té badi-u, ní nálk'eth xa t'a t'át'î sí æeyi té yaåni-u, tth'i tu té nezû seyeriåthÿn-u beghálada háåæâ æat'e.

Háyôrñla Ts'î Dÿne Bexél Yati/Dÿne Ch'áni Ts'î Haní

Diavik t'at'ú níé ts'çdhir ch'a xa yaåni chu yuneth haæa tsamba k'é dárétî ghâ núdhÿr dé, t'at'u æeyi xa ts'ǂn æeghálana sí ghâ háyôrñla dÿne náráde xél halni nélî. Diavik t'â xél Participation Agreement (PA) húlye bets'î sí æeyi xél æedÿri t'at'ú súghá hunidhÿn k'e æeghálana-u, tth'i t'o hunidhÿn sí, hát'u dÿne xél æeghálana. 2019 núltágh k'e Diavik t'ó t'â xél PA húlye bets'î sí æeyi xél ní t'at'ú yeghálaihena sí ghâ dÿne xél halni hîlé sí, æeyi tth'i æedÿri æerehtå'ís k'e bek'uréhtå'ís æat'e.

Æeyi beghâåthen, Diavik tsamba k'é theåæâ sí, háyôrñla ts'î dÿne æeyÿr náílí réådzágh, dÿne æeyÿr tsamba k'é t'at'ú háæâ sí, deni té benágh t'á yeæî rélæî t'á. Harelyø dÿne kós nálye xaæâile húlí, t'â kos náihedel sí, háyôrñla nidel dé, t'a heæî ghâ dÿne xél halni nidé yidhÿn æat'e.

Diavik æedÿri TK Panel húlye sí dÿne æeåa déåtth'i-u, t'at'ú dÿne ch'áni ts'î hani bet'át'î ghár tsamba k'é dárátî ghâ núdhÿr dé æeyi ghá beghálada xa æeyi hát'u háåæâ æat'e. 2019 núltágh k'e æedÿri TK Panel húlye t'a k'e æeghádálaihená sí, níyághe hágér sí, t'at'ú bedárélye xa æeyi ghâ náíhiåti.

T'así Góth Xél Æeghálana-u, Kún K'áæõ Bet'áti

Diavik tsamba k'é theåæâ sí, æeyÿr dî (4) satsán niåts'i heåtsi nechá dáthela æat'e-u, dÿne æeyÿr æeghádálena sí æeyi satsán kón heåtsi t'árát'î, harelyø ghay k'e. 2019 núltágh k'e æedÿri satsán bet'át'î t'á harelyø t'á dî (4) límÿlyõ lígalõ, that'ín yati t'á litres sni si, háníåt'e gÿslín, diesel húlye dek'áæõ bet'át'ñ-u, 12,000 tonnes húlye háníåt'e gǂslín belÿr (Co2e) hálîle. Æeyi satsán dáthela

bet'óth naratl'ír sí, bek'e kón dék'ÿn nareltth'i dólî t'á chadí chu æîyes chu yet'árádel æat'ele. Æeyi beghâåthÿn 2019 núltágh k'e 178,963 lígalõ háníåt'e tåesdóth bet'át'ñ hîlé sí, náåtsî-u, waste oil boiler húlye theæâ æeyÿr bet'át'ñ. Æeyi 2014 núltágh k'e nít'âgh sí ts'î harelyø t'á 1.3 límÿlyõ lígalõ háníåt'e tåesdóth bet'át'î hîlé sí æeyÿr hurék'án t'á hadhÿl hale æat'e, æeyi hát'u bet'át'î t'á tsamba k'é theæa ch'ás nalyéle.

2018 k'e Diavik t'at'u æeyi tthe beghálada køé, Process Plant húlye æeyi t'at'u tthe beghálada sí æedû beghálada xa yílá. Æeyi dû satsán tthe, kimberlite rock húlye ts'î diamonds hálay-u, æeyi tthe t'a beghádhÿr sí, hatå'és lat'e æat'ñ tó, thay lát'e æat'ñ. Æeyi satsán æahtthe hatå'és lát'e æûåi æungâ heåtsi, thay lát'e hanúnile-u, tsamba k'é dárétî ghâ núdhÿr dé, æeyi hatå'és lat'e sí bet'á æeghálada búrenile xa t'e. Diavik æeyi satsán kóth ríådzágh æuhdø æedø beghálada xa yílá; æeyi hát'u æalæî nezû k'e t'á 2019 núltágh k'e hát'u æalæi xa yílá.

T'a Ghár Æeghálada Xaæâ Hát'u Æeghálada chu EMAB chu

2019 núltágh k'e kú, æîåãgh húli nezû æeghálainaile nuwéåni-u nuwets'‡n ritå'ís hulñle. 2018 ts'î Environmental Agreement húlye æîåágh ghay hant'u æeyi ghâ dÿnexél hadi æerehtå'ís haåé sí, Jadízñ Æedzagh N‡n Ts'î Níé Ts'‡n K'aldhÿr bechÿlekui Environment and Natural Resources húlye xa k'aldhÿr helî sí Åuedaåtí Zá æeåk'édîadhel 2018 núltágh k'e, æeyi æerehtå'ís sát'ele héni. Æeyi k'aldhÿr 2018 ts'î Environmental Agreement Annual Report ghâ dÿne ts'‡n heritå'ís sí æedÿri æerehtå'ís bexél heåchúth æat'e Appendix A húlye æeyÿr t'a heåchúth.

Æeyi Environmental Monitoring Advisory Board húlye chu Diavik chu æeåts'éheretå'ís æanat'ñ, t'así æeåk'éch'a ghâ, tsamba ghâ tó, Dÿne Ch'áni ghár æeghálada tó tth'i TK Panel húlye æeyi tth'i ghâ tó, t'at'ú ní badi xa suridhÿn tó, æeyi ghâ æeåts'‡n huretå'ís.

2019 k'e Kitikmeot Inuit Association-u, Tåîchô Government-u, Yellowknives Dene First Nation-u, Åutselk'e Dene First Nation-u, North Slave Métis Alliance-u, æeyi harelyø t'â yeba æeghádálana nuwets'éráíni sí márși bélídi rílæî-u, bets'î business dólî sí-u, tth'i nay dÿne deni thÿn Diavik bechÿlekui xél æeghádálana xa, æeyi tth'i márși hílídi. Diavik t'â xél Participation Agreement húlye bets'î sí chu æeåa æeghálaihena, æeyi bet'á ní ts'çdhir k'áæõ æat'e-u, ní ts'î t'a t'áít'î æeyi nezø súghá ts'‡n bet'át'î

Diavik Diamond Mine Location Map

List of Acronyms (abbreviations found in this report)

AEMP	Aquatic Effects Monitoring Program
ARD	Acid Rock Drainage
BOD	Biological Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
CSR	Comprehensive Study Report – Diavik Diamonds Project
DDMI	Diavik Diamond Mines Inc.
EA	Environmental Assessment
EAAR	Environmental Agreement Annual Report
EMAB	Environmental Monitoring Advisory Board
EMS	Environmental Management System
ENR	Environment and Natural Resources
GNWT	Government of the Northwest Territories
ICRP	Interim Closure and Reclamation Plan
LDG	Lac de Gras
MVLWB	Mackenzie Valley Land and Water Board
NIWTP	North Inlet Water Treatment Plant
NTU	Nephelometric Turbidity Units (measurement of water turbidity)
PA	Participation Agreement
PK/PKC	Processed Kimberlite/ Processed Kimberlite Containment
PVP	Permanent Vegetation Plot
QA/QC	Quality Assurance/Quality Control
SNP	Surveillance Network Program
SOP	Standard Operating Procedure
TEK/TK/IQ	Traditional Ecological Knowledge/Traditional Knowledge/Inuit Qaujimajatuqangit
TP	Total Phosphorous
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
WLWB	Wek'èezhìi Land and Water Board
WMMP	Wildlife Monitoring and Management Plan
WOE	Weight of Evidence
WTA	Waste Transfer Area
ZOI	Zone of Influence

Definitions

Abundance – a count or measurement of the amount of any one thing

Action Level - a level of environmental change which, if measured in an aquatic effects monitoring program, results in a management action well before effects that could be harmful to the lake can happen

Adaptive Management - a systematic way of learning from monitoring results or management actions with the intent to improve operating or management practices

Benthic Invertebrates – small bugs without a backbone that live in the sediments on the bottom of a lake or river; can include flies, worms, clams, etc.

Chlorophyll *a* - found in tiny plants and traps light energy from the sun

Density – total amount of a given substance within a defined area

Deposition Rate – the speed at which something settles on to a surface, e.g. how slow/fast a piece of dirt falls through water to settle on the bottom of a lake

Distribution – how any one thing may be spread out over an area

Effluent – water from the sewage or water treatment plant that is discharged from the plant after cleaning/treatment

Enrichment – addition of an ingredient that improves quality; if too much is added, it may then start to reduce quality

Environmental Assessment – process to review potential environmental impacts of a project that is being considered for development and decide if the project can be developed

Eutrophication – water bodies like a lake receive a lot of nutrients and then start to grow a lot of plants within the water

Habitat Compensation – replacement of natural habitat lost during construction of the mine; done using human-made features to improve areas of natural habitat

High-level Effects – change noticed between different areas that may start to be higher than an agreed-upon standard

Indicator – information used to try and understand what is happening in the environment

Interim Closure & Reclamation Plan – a document that outlines ways to close a mine, including what needs to be done with water, land and wildlife. 'Interim' means that it is less detailed than a final plan, as there are still questions to answer before the final design or plan can be done.

Low-level Effect – early-warning level where little change is detected

mg/dm²/y – milligrams per decimeter squared per year, the amount of dust deposited in a given area each year

Mitigation Measures – things that are done to control or prevent a risk or hazard from happening

Moderate Effect – some change noticed between different areas that may start to be higher than an agreed-upon standard

Monitoring – a way to check on performance and compare it against an expected result, e.g. is anything changing

Parameters – chemical and physical signs that can be used to determine water or soil quality

Plume – an area in air, water or soil that is affected from a nearby source, e.g. a plume of smoke around an erupting volcano

Prediction – an educated guess of what will happen in the future, can be based on existing knowledge or experience where possible

Progressive Reclamation – starting to repair certain areas of land damage by mining activity while the rest of the mine is still operating; focus is on areas where mining activities are complete

Research – a structured way to test questions on unknown features of the environment, e.g. reasons why a change may be happening

Risk Assessment – a way to identify possible harmful effects by looking at how harmful the effect could be and how often it could occur. After risks have been identified, management actions are defined.

Sediment Chemistry – the mineral content of dirt particles that sit on the bottom of the lake

Seepage – a release of water or other liquid material that flows through or out of a containment area

Total Suspended Particulates - small particles in the air that measure 100 micrometers in size (which is slightly larger in size than the diameter of a human hair at 75 micrometers)

Trophic Status – a measure of lake productivity based on how many plants are in the lake

Water Quality – an overall characterization of the chemical (nutrients or metals), physical (temperature) and biological (algae) features of water in a lake or river

Weight-of-Evidence (WOE) – an estimate of the strength (weight) of proof (evidence) that is provided by jointly considering the results from each type of sample (e.g. water quality) throughout a season or across multiple years, to determine the overall effect of mine operations on Lac de Gras.

Zone of Influence (ZOI) – area of reduced wildlife occupancy as a result of mining activities.

Introduction

Diavik and the Environmental Agreement

The Diavik diamond mine is located on the East Island of Lac de Gras, in Canada's Northwest Territories, approximately 300 kilometers northeast of the capital city, Yellowknife. The lake is roughly 60 kilometers long and drains into the Coppermine River, which flows north to the Arctic Ocean. Diavik Diamond Mines (2012) Inc. (DDMI or Diavik) undertook an Environmental Assessment that started in 1998 through the Canadian Environmental Assessment Agency. The mine has been operating since 2003, and protecting the environment around the mine continues to be important.

Diavik signed an Environmental Agreement (the Agreement) with five (5) Indigenous organizations and the federal and territorial governments in 2000. The Agreement states what Diavik is to do to protect the environment while operating and closing the mine.

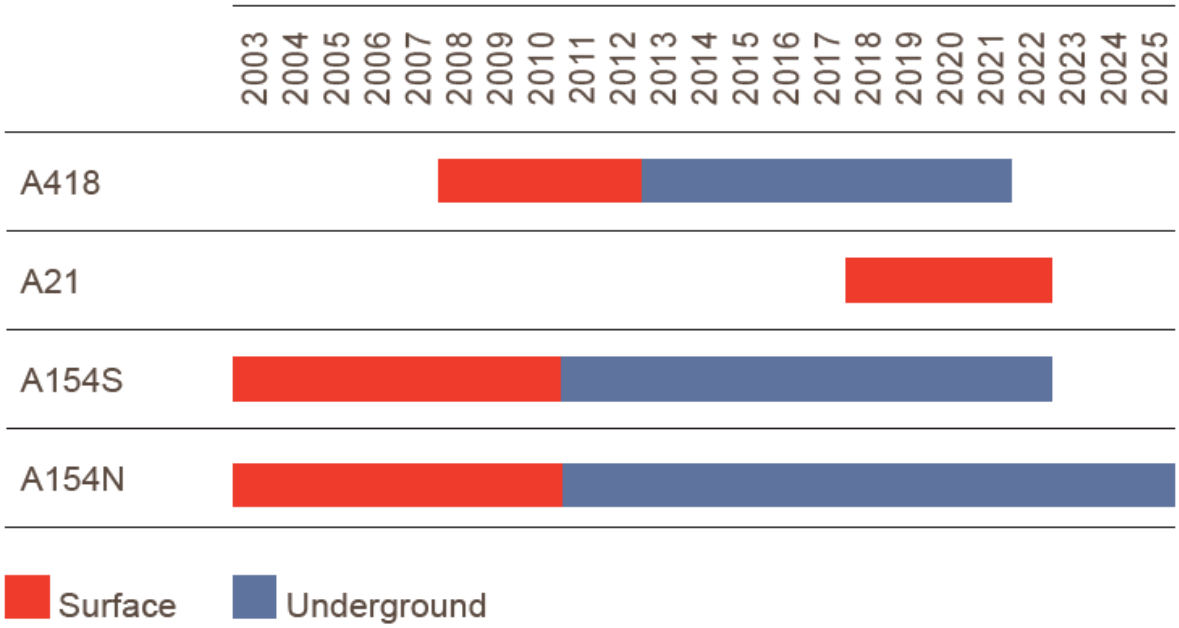
The Environmental Monitoring Advisory Board (EMAB) was established under Article IV of the Agreement as a public watchdog of the regulatory process and the implementation of the Agreement.

This report summarizes the results of Diavik's environmental monitoring and management programs during 2019. Complete copies of the numerous reports that Diavik submits each year can be found in the EMAB library (at their office, or on-line library) or the Wek'èezhìi Land and Water Board public registry.

Operational Plans

The Diavik diamond mine was in its seventeenth year of operations during 2019. Underground mining from both the A154 and A418 pipes occurred in 2019 and will continue into 2020. Construction of a third dike to support open pit mining of the A21 kimberlite pipe began in 2015, and was finished in 2018 with operation of the A21 mine also starting in 2018. The A21 open pit mine will continue to operate during 2020. The figure below shows a timeline of Diavik's mine plan, which shows mining activities planned for the next several years and closure planned around 2025.

Mine life



***If the A21 Below Pit Project proposal is approved to proceed, mining of the A21 kimberlite pipe may extend to 2025.**

Figure 1 Diavik Diamond Mine labelled site satellite photo.

1. Environmental Agreement Annual Reporting Commitments

Section 12.1 of the Environmental Agreement (the Agreement) outlines the content to be reported annually to the Parties, the Government of Nunavut, and the Environmental Monitoring Advisory Board on June 30th (submission date revised from March 31st in 2003), as outlined in Table 1.

Table 1: Summary of the Agreement Commitments in Relation to the Environmental Agreement Annual Report (EAAR)

The Agreement Commitment	Plain Language Interpretation (from EMAB)	Report Section
Comprehensive summary of all supporting information, data and results from the Environmental Monitoring Programs and all studies and research	A full summary of all supporting information, data and results from the Environmental Monitoring Programs, plus all studies and research related to these	2, 3
Rolling summary and analysis of environmental effects data over the life of the Project; compare results to predictions in environmental assessment and the Comprehensive Study Report – Diavik Diamonds Project (CSR), and illustrate any trends	A summary that adds in data of each year and an analysis of environmental effects data over the life of the Project - to show patterns over the years	3
Comprehensive summary of all compliance reports required by the Regulatory Instruments	A full summary of all reports on how Diavik has followed all rules and regulations in the Regulatory Instruments	5
Comprehensive summary of operational activities during the preceding year	A full summary of mining activities during the year up to the annual report	0, 5
Actions taken or planned to address effects or compliance problems	The ways Diavik is fixing any environmental effects or problems following rules and regulations	5
Operational activities for the next year	A summary of mining activities for the next year	0, 5
Lists and abstracts of all Environmental Plans and Programs	Lists and summaries of all Environmental Plans and Programs	2
Verification of accuracy of environmental assessments	A check that environmental assessments are correct	3
Determination of effectiveness of mitigation measures	A report on how well steps to lessen effects are working	Appendix II
Comprehensive summary of all adaptive management measures taken	A full summary of all adaptive management steps taken	Appendix II

The Agreement Commitment	Plain Language Interpretation (from EMAB)	Report Section
Comprehensive summary of public concerns and responses to public concerns	A full summary of public concerns and responses to public concerns	iii, 4
Comprehensive summary of the new technologies investigated	A full summary of the new technologies Diavik has looked into	5
Minister's comments, including any Minister's Report, on the previous Annual Report	The Minister's comments on the Annual Report from the year before, including any Minister's Report	v, Appendix I
Plain language executive summary and translations into Dogrib/Tłįchǫ, Chipewyan, and Inuinnaqtun using appropriate media	Plain English executive summary translated into Dogrib/Tłįchǫ, Chipewyan, and Inuinnaqtun	i

2. Environmental Programs and Plans - 2019

This section outlines the various environmental plans and programs that Diavik follows. For each plan/program, a brief outline is provided that explains why the program is being done and/or how it is completed. Many of these plans and programs are the same from one year to the next. As stated in Diavik's Water License (W2015L2-0001), plans that have not changed do not require updates; those that have been updated and submitted for regulatory approval during 2019 are identified in Table 2 (the table also includes commentary on plan updates as of May 2020). Additionally, Appendix II contains a list of mitigation measures and adaptive management actions that have been implemented during mine operations.

Management & Operations Plans

Management and operations plans are site-specific documents that identify potential environmental issues and outline actions to minimize possible impacts that could result from mining activities. They are reviewed by DDMI each year and updated as required (i.e. if something changes). Table 2 lists the management and operations plans required under DDMI's water license, some of which are also linked to Diavik's land leases and Land Use Permits, and summarizes the purpose of the plans and identifies which plans were updated for 2019.

Table 2: Management & Operations Plans for the Diavik Mine*

Plan & Version Number	Purpose	Updated in 2019 (Y/N)	Updates/ Comments
Ammonia Management Plan (AMP), v7	To assist in achieving the lowest practical amount of ammonia from explosives that would enter the mine water and waste water streams. The plan details how ammonia management performance is evaluated, and includes details of ammonia management techniques.	No	WLWB approved updates in March 2020 to remove references to the concentrated sulphuric acid dosing system, which is to be decommissioned/removed from the North Inlet Water Treatment Plant.
Waste Rock Management Plan (WRMP) v10	Rock types that surround the kimberlite may have minerals in them that can cause water to become acidic when it runs over the rock. The plan describes how DDMI identifies, separates, and stores the rock to reduce acid runoff.	Yes	WLWB approved updates (WRMP V9) in July 2019 regarding changes to ore stockpiling and changes to verification procedures for A21 waste rock. WLWB approved updates (WRMP V10) in May 2020 to address previous Board directives, changes to sulphur testing procedures for A21 waste rock, and changes to ore stockpiling locations.

Plan & Version Number	Purpose	Updated in 2019 (Y/N)	Updates/ Comments
Closure & Reclamation Plan (CRP) v4.1	Outline closure goals (overall vision for what Diavik would like to achieve), objectives (steps the organization needs to take to achieve the goals – specific and measureable) and criteria (a standard against which success is measured) and includes engineering designs and research programs for closure of all the major components of the mine. Because it is a plan that evolves over time, it does not yet include final closure designs or details on specific after-closure monitoring programs.	Yes	- Version 4.1 submitted in Dec 2019 to WLWB. Approval of Version 4.1 is pending.
Hazardous Materials Management Plan (HMMP), v19	Describe procedures for the safe and efficient transport, storage, handling and use of chemicals for mining. Prevention, detection, containment, response, and mitigation are the key elements in the management of hazardous materials. The plan also describes how hazardous materials will be removed from site during closure.	No (last WLWB approval in 2016)	N/A
Contingency Plan (CP, used to be called the Operational Phase Contingency Plan), v22	Describe response procedures for any accidental release (spill) of hazardous or toxic substances, as well as procedures for water management. The CP outlines the responsibilities of key personnel and gives guidelines for minimizing impacts to the environment, including contingencies for the underground mine.	No (last WLWB-approved update in 2017)	Requires approval by GNWT Minister of Lands once WLWB approval received.
Water Management Plan, v15	Describe how water around the site is moved, treated, monitored and controlled. Also includes a 'water balance', which gives Diavik an idea of the amount and location of water on site at any given time, so that plans can be made for handling and treating water.	No	WLWB approved updates in March 2020 in support of decommissioning and removing the acid dosing system from the North Inlet Water Treatment Plant.
Waste Management Plan, V2 (includes Incinerator v1, Hydrocarbon Impacted Materials, Solid Waste & Landfill v1, Dust)	Identify the types of waste generated on site and outline methods for the minimization, collection, storage, transportation and disposal of wastes in a safe, efficient and environmentally compliant manner. Characterizes and segregates waste streams according to their on- and off-site disposal requirements.	No (last WLWB-approved update in 2018)	N/A

Plan & Version Number	Purpose	Updated in 2019 (Y/N)	Updates/ Comments
A21 Construction Environmental Management Plan, v5.2	Outlines how Diavik plans to reduce environmental effects from A21 dike construction activities. Includes a description of on-land and in-lake construction activities, including dewatering. Environmental management controls and monitoring requirements are also described.	No (last WLWB-approval in 2017)	N/A
Engagement Plan, v3	Outlines the outreach and engagement process with communities in relation to the Diavik Mine Project under Water Licence W2015L2-0001 and in line with the WLWB's Engagement Guidelines for Applicants and Holders of Land Use Permits and Water Licences.	No	WLWB approved updates in May 2020 to address WLWB Directives from its review of previous versions of the Plan.
Processed Kimberlite Containment (PKC) Facility Operations Plan, v4.1	Outlines how to handle the water and solids within the PKC facility. Includes information on PKC design, dam construction, monitoring programs for water, ice & solids stored within the PKC.	No (last WLWB-approved update in 2018)	- Water against the Dam requirements - PK management process - Address Board directives - DDMI submitted PKC Facility Operations Plan V5 to WLWB for review in April 2020. The plan updates reflect Diavik's proposed modifications to the processed kimberlite deposition and water management within the PKC Facility.
North Inlet Water Treatment Plant (NIWTP) Operation Manual, v2	Provide information about the plant (area layout, treatment capabilities, etc.), operational requirements of the plant (as it relates to water management both on site and within the plant) and plant maintenance requirements.	No	WLWB approved updates in March 2020 to remove significant unnecessary standard operating procedure level details describing how to operate the treatment plant. Removed requirement for sulfuric acid dosing system from the updated plan.
Sewage Treatment Plant (STP) Facility Operations Plan, v6	Outlines the design and layout, operating rules, monitoring requirements, what to do in case of an emergency, maintenance and closure of the plant.	No (last WLWB approval in 2011)	N/A

Plan & Version Number	Purpose	Updated in 2019 (Y/N)	Updates/ Comments
Wildlife Management and Monitoring Plan R3	Outlines methods to limit impacts to wildlife as a result of mine operations and programs to determine if the distribution (location as it relates to the mine, habitat and region) and abundance (number) of wildlife species are affected by the mine.	No (last updated in 2013)	DDMI also intends to present descriptions of the monitoring program (s) for wildlife in a stand-alone Wildlife Management and Monitoring Plan (WMMP) document by June 2020
Environmental Air Quality Monitoring and Management Plan	To identify air quality monitoring requirements on site. The components of the EAQMMP include dust deposition (dustfall) monitoring (as part of the Aquatic Effects Monitoring Program (AEMP)), a snow core program (as part of the AEMP), and reporting to the National Pollutant Release Inventory (NPRI), and the national Greenhouse Gas Reporting Program (GHGRP) to Environment and Climate Change Canada (ECCC).	Yes	DDMI has discontinued sampling and reporting on Total Suspended Solids (TSP) monitoring at Diavik for a number of reasons including that TSP results over the past 4 years are below what was predicted from the 2012 dispersion model and that the Arctic environment presents challenges to the operational performance of TSP samplers.

*****Management Plan status reflects updates up to May 2020.

Monitoring Programs

Monitoring programs are designed to track changes to the environment as a project develops and are usually linked to predictions from an Environmental Assessment (EA). Monitoring programs required for Diavik are summarized within the water license (W2015L2-0001), Fisheries Authorizations or EA. A summary of the monitoring programs conducted during 2019 is outlined in Table 3.

Table 3: Monitoring Programs for the Diavik Mine

Monitoring Program	Purpose	Completed in 2019 (Y/N)	Frequency/ Comments
Wildlife			
Caribou Behaviour Observations	If/how caribou behaviour changes in relation to distance from mine	Y	Annually
Aerial Caribou Surveys	Zone of Influence of mining activities in the LDG region	N	Suspended
Caribou Road Surveys	Effectiveness of mitigation measures	Y	Annually, initiated based on collar data or reported sightings
Wolverine Track Survey	Wolverine presence in the area of the mine	Y	Annually. In winter of 2019/2020 DDMI completed one round of wolverine track surveys but was unable to undertake a second round due to COVID-19 related disruptions to site operations.
Wolverine DNA	Wolverine numbers in the Lac de Gras (LDG) area	N	Regional program with GNWT & other mines; last survey 2014; next survey TBD
Grizzly Bear DNA	Bear numbers in the LDG area	N	Regional program with GNWT & other mines; last survey 2017; next survey TBD
Raptor Survey	Regional estimate of number of nests with birds in them and how many chicks are alive	N	Completed every 5 years with GNWT & other mines; last survey 2015; next survey to be conducted in 2020

Monitoring Program	Purpose	Completed in 2019 (Y/N)	Frequency/ Comments
Building Inspections	Survey mine buildings and pit walls to identify bird nests and/or wildlife use	Y	Annually
Waste Inspections	Monitor waste disposal that may attract animals	Y	Annually
Wildlife Presence	Track wildlife observations and numbers on the mine site	Y	Annually
Wildlife Mortality & Injury	Track any wildlife deaths or injuries associated with mine operations	Y	Annually
Water			
Mine Site Water Quality	Test water against Water License limits at a set frequency (Surveillance Network Program, SNP)	Y	As outlined in Water License
Lake Water Quality	Changes to water quality in LDG over time (part of Aquatic Effects Monitoring Program, AEMP)	Y	Annually
Nutrients, small Plants & Bugs in Water	Changes to nutrients, plants and bugs that live in the water column, over time (part of AEMP)	Y	Annually
Lake Sediments	Changes to sediment quality in LDG over time (part of AEMP)	Y	Completed every 3 years; last sampled in 2019
Lake Bottom Bugs	Changes to number and type of bugs that live on the lake bottom, over time (part of AEMP)	Y	Completed every 3 years; last sampled in 2019
Large Bodied Fish Health	Fish health tests through palatability and/or tissue chemistry	N	AEMP Traditional Knowledge Study completed every 3 years; next scheduled in 2021
Small Bodied Fish Health (Slimy Sculpin)	Fish health tests through tissue chemistry	Y	Completed every 3 years.
Water Quantity	Measure levels and sources of water used, added or moved on site	Y	Annually
Air Quality, Dust & Vegetation			
Dust Deposition	Amount and chemistry of dust collected in dust gauges and on snow, close to and far from the mine	Y	Annually
Total Suspended Particulates	Continuous monitoring of the amount of small dust particles that are emitted from mine operations	N	Annually
Meteorological	Weather trends and influence on water balance and dust deposition	Y	Annually
Wildlife Habitat Loss	Track habitat lost due to mine development; total loss and preferred habitats for individual species	Y	Annually
Vegetation Plots	Changes to type and amount of plants over time, near and far from the mine	N	Completed every 5 years; last

Monitoring Program	Purpose	Completed in 2019 (Y/N)	Frequency/ Comments
			completed 2016; next scheduled in 2021
Lichen Study	Metal levels in lichen and soil, near and far from the mine; included health assessment for caribou consumption	N	Completed every 5 years; last completed 2016; next scheduled in 2021

Aquatic Effects (Lake Water Quality & Fish Health)

The AEMP is designed to measure short- and long-term changes in Lac de Gras. Sampling efforts focus on sampling stations in Lac de Gras that are located closer to the mine (where effects would first be expected to occur). There are also sampling stations far away from the mine (where effects would take much longer to occur). Comparing information from both places allows changes in the lake caused by the mine to be measured over time (temporal) and can be measured near the mine site and further away (spatial).

There are 39 sample locations (Figure 2) where many different types of samples are taken. The types of samples that were collected in 2019 included: water quality (e.g. ammonia, metals), the amount and quality of dust deposited, nutrient indicators, and other information used to understand the lake environment, e.g. chlorophyll *a* (material found in tiny plants that traps light energy from the sun), phytoplankton (tiny plants), zooplankton (tiny animals), and fish.

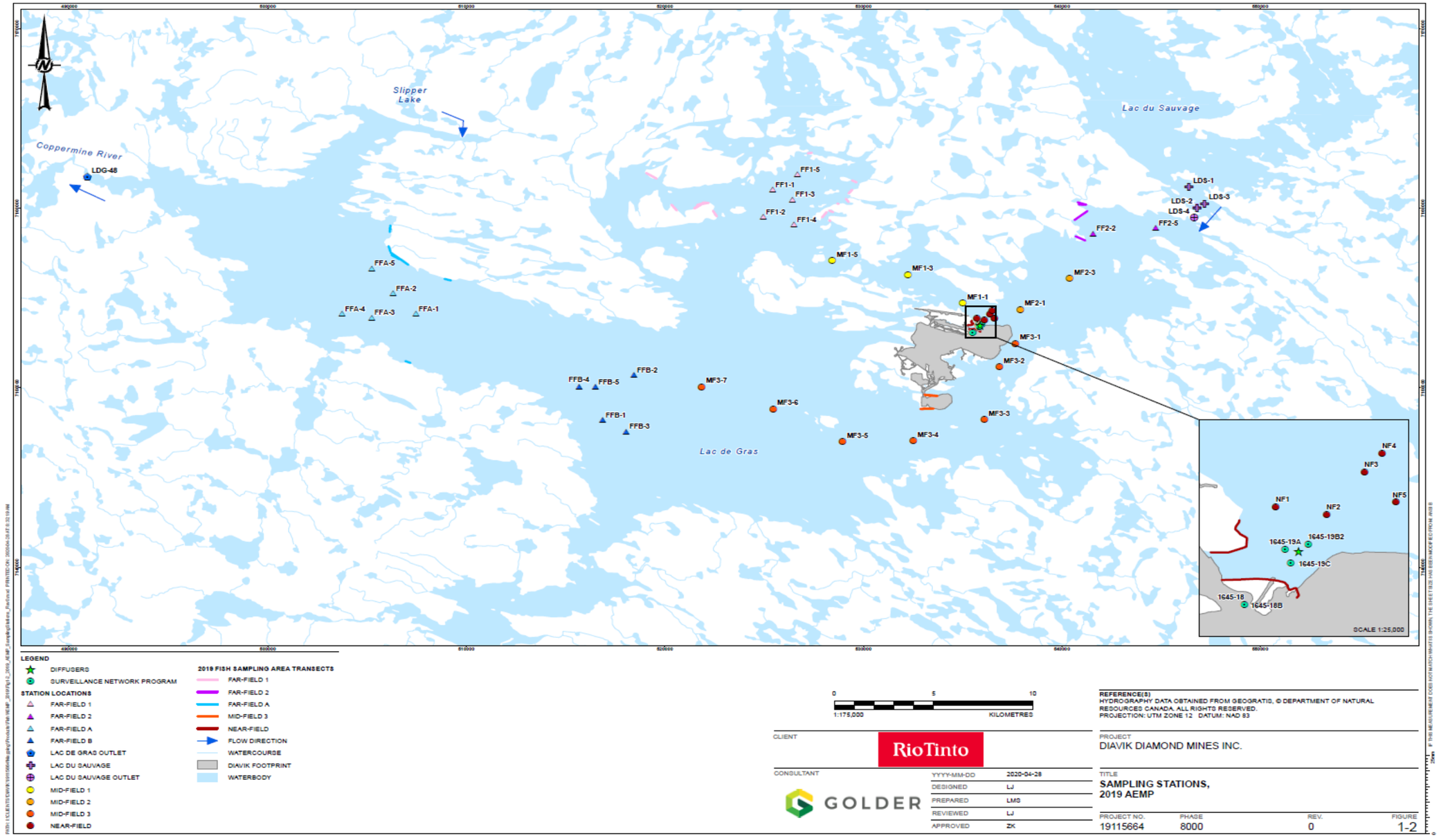


Figure 2 2019 AEMP sample locations.

Air Quality (Dust & Emissions)

The goal the Dust Deposition Monitoring Program is to understand dust deposition rates (how much dust falls onto the tundra and lake) caused by project activities. The program provides information to support the Wildlife Effects and Aquatic Effects monitoring programs.

The sampling stations for the Dust Deposition Monitoring Program (Figure 3) were set up using a transect approach (series of sample locations that extend outwards on ice and land from the mine site). In October 2017, two new sample stations were added (i.e., Dust 11 and Dust 12) and Diavik now monitors:

- 14 permanent dust gauges - fixed-location sampling devices that collect dust for analysis all year long; and,
- 27 seasonal snow survey stations - GPS locations where Diavik collects snow samples to measure the amount of dustfall over the winter (27 samples) and the water quality of the snow where dust was deposited on the lake (16 samples).

They are sampled each year and results have been compared with the former British Columbia (BC) dustfall objective for the mining, smelting, and related industries. This objective is used by some mines in the Northwest Territories (NWT) for comparison purposes only, as there are no standards or objectives for the NWT.

The goal of the Air Quality Monitoring Program is to help with finding trends in dust levels beyond the area of the mine. Two (2) continuous background air sampling stations monitor Total Suspended Particle (TSP) concentrations (TSP – small particles in the air that measure 100 micrometers in size, which is slightly larger in size than the thickness of a human hair at 75 micrometers) continuously and hourly. Diavik also keeps track of its diesel fuel use.

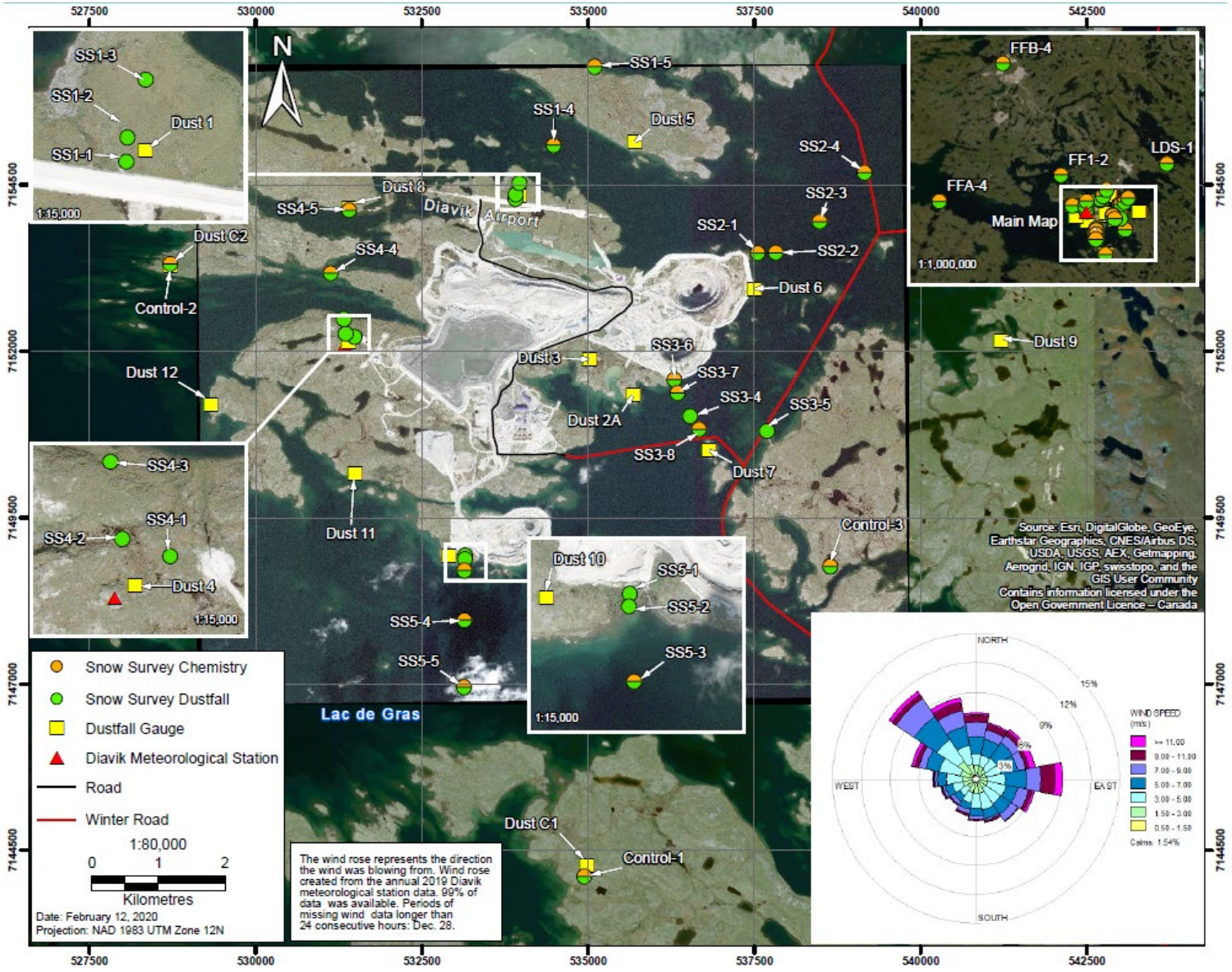


Figure 3 2019 Air quality sample locations – dust and snow surveys.

Surveillance Network Program (Water Quality at the Mine Site)

Diavik monitors water quality around the mine site in accordance with the Surveillance Network Program (SNP), which is a component of Diavik's water license. The SNP outlines where Diavik collects water samples, how often samples are collected, and what parameters (metals, nutrients and other water quality characteristics) are measured. The SNP also outlines sampling requirements for water that flows into Lac de Gras during dewatering activities (e.g. dike construction).

Diavik monitors dams and dikes around the mine site for potential seepage (water from inside the dam that may flow through the dam to the environment). The dikes and dams are designed to hold back water; however, some seepage (leaking water) through these structures is expected. The purpose of the survey is to check areas for potential leaks so that Diavik can take appropriate measures to stop the water. The monitoring includes regular inspections of the dam and dike structures and recording the amount of water; some water samples are also taken. The Processed Kimberlite Containment (PKC) Facility holds enough water that it does not completely freeze in the winter, so water can move within the dam all year round.

Diavik has seepage interception (capture) wells and a water control system to collect water from the dams before it enters Lac de Gras. It includes a number of collection wells and ponds (Figure 4), which surround major structures such as the PKC Facility, and are monitored. There are some times where runoff from other areas of the mine may not go into a pond and will enter Lac de Gras, but it is usually a small amount of water for a short period of time.

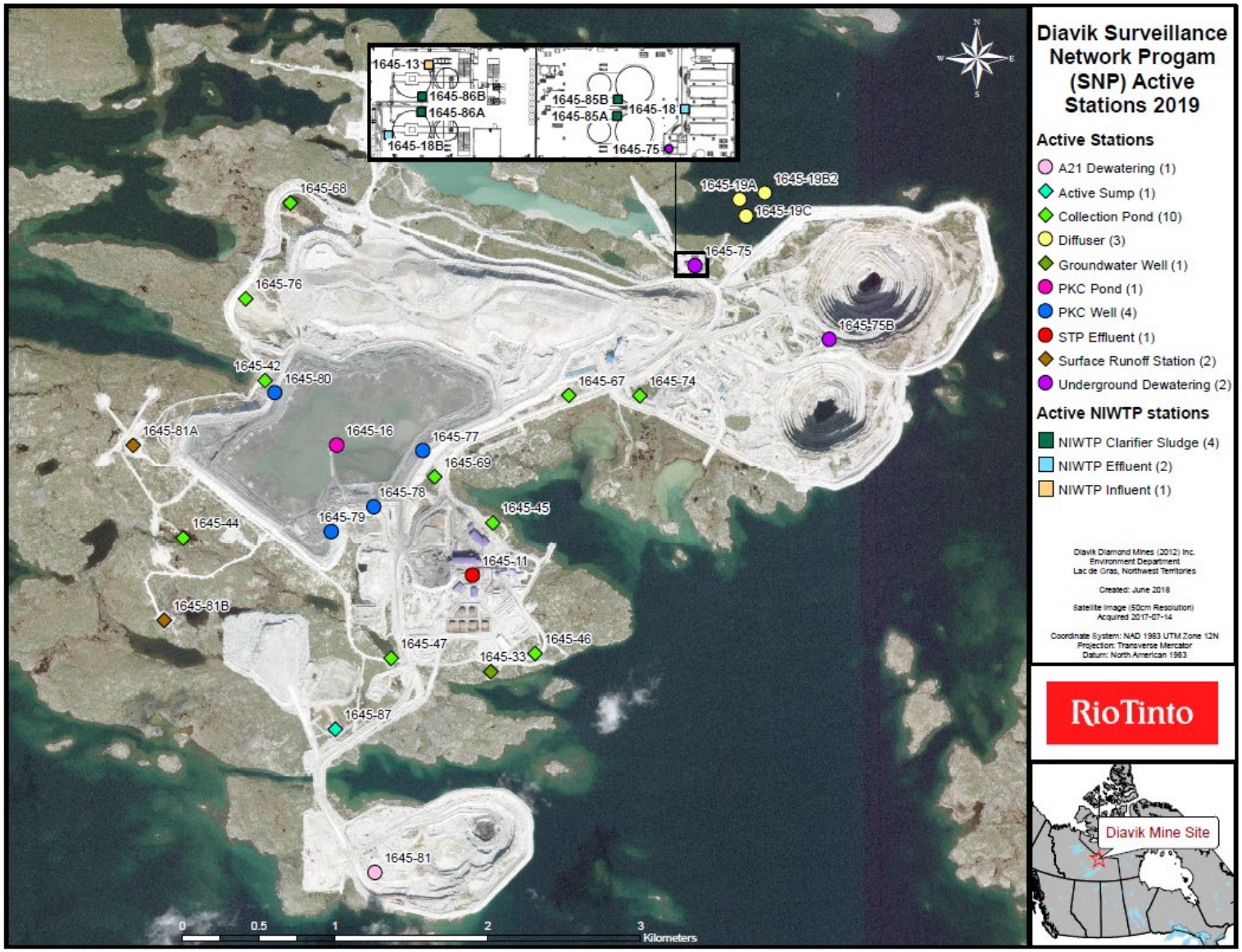


Figure 4 2019 Surveillance Network Program (SNP) sample locations.

Wildlife and Plant Monitoring

Diavik developed a wildlife monitoring program to check if the actions taken to reduce impacts to wildlife as a result of the Diavik mine project are working. The program is called the Wildlife Monitoring and Management Plan (WMMP) and is a method for detecting, modifying and improving procedures for wildlife and habitat management at the mine site. The WMMP is therefore closely linked with Diavik policies, guidelines and management plans. As outlined in Table 3, the program includes monitoring for vegetation/wildlife habitat, caribou, grizzly bear, wolverine, raptors and waste management. The Diavik wildlife study area is shown in Figure 5.

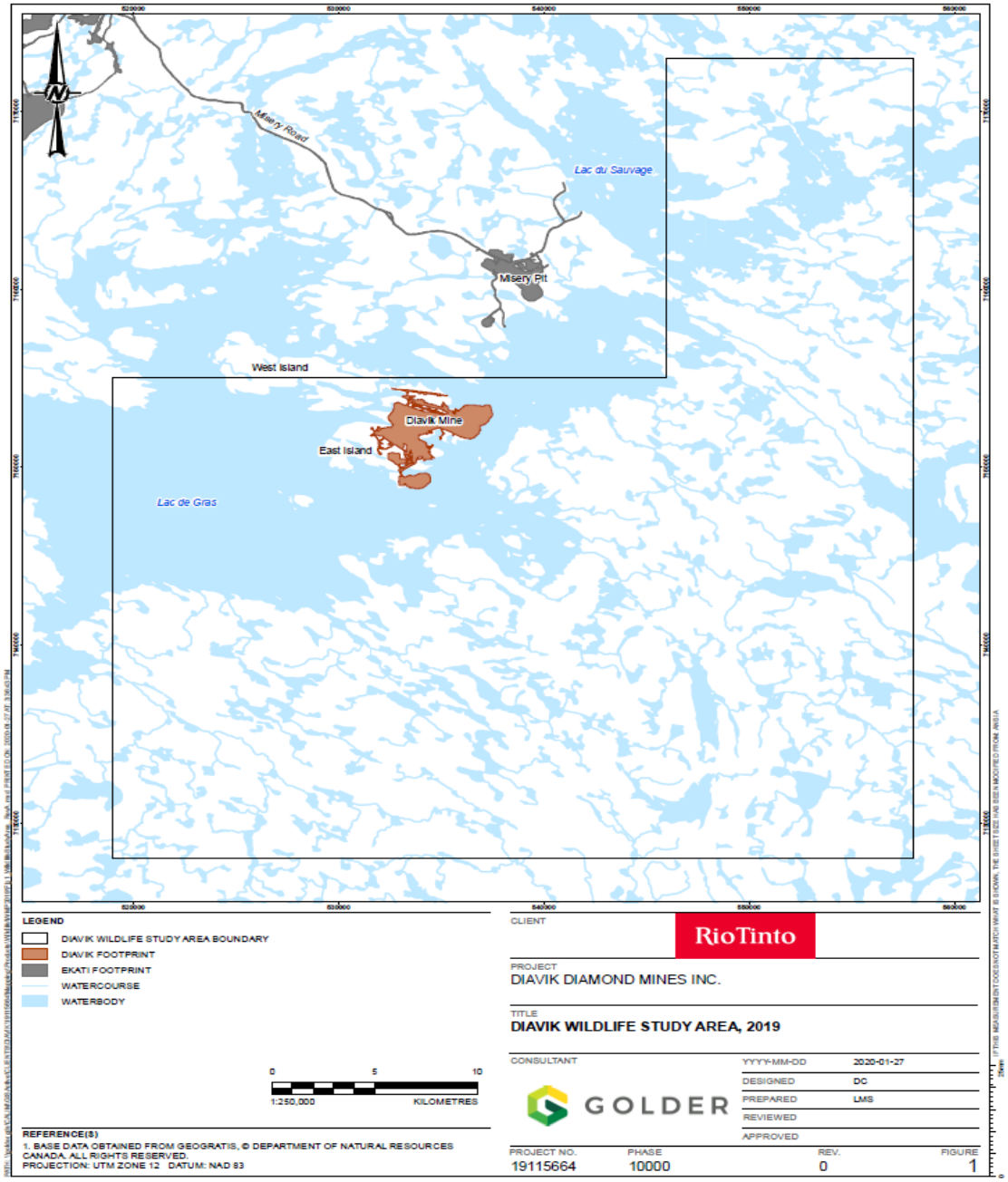


Figure 5 Regional wildlife study area for the Diavik Mine.

3. Results: Summary of Rolling Effects & Monitoring Program Changes

This section gives a summary of monitoring results and changes that have occurred to each program over time. Many of the changes have been made in response to information collected, items missing from study designs or based on feedback from various stakeholders. The Environmental Assessment (EA) included predicted indicators (things we can watch for change) that would either stay the same or change over time. The predictions (estimates) for each indicator have been included in this section, followed by a summary of the information collected to confirm those predictions over the years. Graphs and figures or tables are given where practical to show the trends over time. Where trends are not similar to those predicted, DDMI has included a brief discussion of possible reasons. Further details can be found in the full reports that Diavik produces for each topic and a plain-language summary of what the results from the environmental monitoring programs mean is included as a 'Report Card on the Environment' in the Environmental Monitoring Advisory Board's (EMAB) Annual Report.

Water and Fish

At Diavik, water quality and fish health are monitored through the Aquatic Effects Monitoring Program (AEMP). The discussions below regarding fish and water come from the results of the AEMP.

Water

What effect will the mine development have on water quality?

EA Predictions and Overall Status:

- ***Water will remain at a high quality for use as drinking water and by aquatic life (i.e. meet CCME thresholds);***

Confirmed to date based on AEMP sample results; there is strong evidence for nutrient addition in Lac de Gras and weak evidence that toxic effects are occurring.

- ***Localized zones of reduced quality during dike construction;***

Confirmed based on water samples during construction – all dike construction completed.

- ***Nutrient enrichment (increased nutrients, particularly phosphorus), primarily from the mine water discharge, could change the trophic status (a measure of how productive the lake is) of Lac de Gras of up to 20% (or 116km^2) during operations. The overall trophic status in most of Lac de Gras is not expected to change.***

Confirmed to date based on AEMP sample results – the area of Lac de Gras impacted by phosphorus varies by year and has exceeded the 20% (or 116km^2) threshold twice during ice cover but never during open water.

- **Post-closure runoff (water flowing off the mine site) expected to affect the quality of two inland lakes.**

Post-closure effects cannot be measured at this time.

2019 Observations:

No Action Levels were triggered in 2019 for the eutrophication indicators (nutrients), benthic invertebrate community and plankton.

Sixteen water quality parameters (e.g. minerals and metals) triggered Action Level 1 (out of a total of 9 Action Levels) for mine effluent water quality, which is considered an early-warning indicator of effects in Lac de Gras. Of the sixteen water quality parameters, nine (9) also triggered Action Level 2 which is still considered early-warning and triggers a requirement to develop an AEMP Effects Benchmark (threshold criteria). None of the water quality parameters reached Action Level 3 (Table 4 below). Regulated effluent parameters remained below the limits stated in the Water License.

Table 4: Action Levels for 2019 AEMP.

Component	Variable	Action Level
Water Quality	Total Dissolved Solids - Ice Cover and Open Water	2
	Turbidity – lab - Ice Cover	1
	Calcium (dissolved) - Ice Cover and Open Water	1
	Chloride - Ice Cover and Open Water	2
	Magnesium (dissolved) - Ice cover	1
	Sodium (dissolved) - both	2
	Sulphate - open water	2
	Suplhate - ice cover	1
	Ammonia - open water	2
	Nitrate - Open Water	2
	Nitrate - Ice Cover	1
	Aluminum - Ice Cover	1
	Barium - Ice Cover	1
	Manganese - Ice Cover	1
	Molybdenum - Ice Cover and Open Water	2
	Silicon - Ice Cover	1
	Strontium - Ice Cover and Open Water	2
	Uranium - Ice Cover and Open Water	2
Sediment Quality	Total Bismuth	2
	Total Molybdenum	1
	Total Uranium	1
Fish	Fish	2

The 2019 effluent toxicity results indicated that the effluent discharged to Lac de Gras in 2019 was non-toxic.

Elevated concentrations of nutrients extending to various distances from the Mine (depending on variable and season) suggest the Mine is increasing nutrients in Lac de Gras. In 2019, the total phosphorus (a nutrient) concentration was below the normal range; therefore, the area of the lake affected by total phosphorus was 0%. The extent of effects from total nitrogen (a nutrient) was the entire lake area during the open-water season and 85% (or 484km^2) of the lake during the ice-cover season. The extent of effects on chlorophyll *a*, a good measure of the effects of nutrient enrichment, was estimated as 0.1% (or 0.5km^2) of the lake area.

Mine-related effects on bottom sediments in areas of Lac De Gras near the mine (Near Field stations) were identified for some metals and nutrients; however, none of the metal and nutrient concentrations triggered an Action Level higher than 2.

The extent of mine-related effects on phytoplankton and zooplankton was 0% and 29%, respectively, of the lake. The 2019 plankton and benthic invertebrate data do not suggest that adverse effects are occurring in Lac de Gras. Results are consistent with nutrient addition, as demonstrated by increase in small plants and bugs in the water column near the mine.

The 2019 slimy sculpin study showed the sculpin fish were healthy, in good physical condition, and reproducing. Some fish samples showed signs of parasites, specifically tapeworms, but this presence of parasites was not associated with closeness to the Mine. Fish tissue concentrations of metals from fish sampled in 2019 were similar to results since 2013, with the exception of molybdenum which exhibited an increase of 34%.

In 2019, a Special Effects Study (SES) was conducted in August to provide additional information to support the evaluation of potential dust-related effects on water quality and aquatic life. The conclusions of the study showed that dust fall is likely to have a slight influence on lake water quality and that it is not responsible for phosphorus (nutrient) loading to Lac de Gras. The treated water from the North Inlet Water Treatment Plant (NIWTP) was the main source for phosphorus loading. Based on the results of this study additional sampling effort in the lake to further investigate if dust has an impact on the lake is not necessary.

In 2019, nearly all concentrations (>99%) of variables in samples collected at the mixing zone boundary (where mine effluent is discharged to the lake) were within the relevant AEMP water quality Effects Benchmarks that are based on the Canadian Water Drinking Quality Guidelines for the protection of aquatic life and drinking water (Table 3-2 of AEMP 2019 Annual Report).

The Weight of Evidence (WOE) assessment is meant to rank impacts to Lac de Gras using the data collected by the AEMP. Impacts from different parts of the program (e.g. Fish Health) are rated as being: negligible/none (score of 0), low (1), moderate (2) or strong (3). They are also categorized as either 'toxicological' (harmful response) or 'nutrient enrichment' (increased nutrients). The overall WOE indicated that nutrient addition is happening in Lac de Gras, however there is nothing that shows a toxic effect in Lac de Gras from mine operations. The WOE results for the 2019 AEMP are presented in the below table.

Table 5 Weight-of-Evidence Results, 2019 AEMP

Ecosystem Component	Rating
Toxicological Impairment	
Lake Productivity	0
Benthic Invertebrates	0
Fish Population Health	2
Nutrient Enrichment	
Lake Productivity	3
Benthic Invertebrates	3
Fish Population Health	2

2018 Observations:

- Nineteen water quality parameters (e.g. a metal or nutrient) triggered Action Level 1 (out of a total of 9 Action Levels) for water quality, which is considered an early-warning indicator of effects in Lac de Gras. These included many previously identified parameters and four additional ones that were added this year (i.e., ammonia, iron, lead and titanium) because concentrations at stations that may be affected by dust in the middle of the lake were slightly higher than the natural water quality for Lac de Gras. There were also 10 out of the 19 parameters also reached Action Level 2. This is still considered early-warning and triggers a requirement to develop an AEMP Effects Benchmark (threshold criteria). Most parameters that reached Action Level 2 already have a benchmark value, with the exception of calcium; Diavik will therefore develop a response for this. Regulated effluent parameters remained below the limits stated in the Water License.

  Elevated concentrations of nutrients extending to various distances from the Mine (depending on variable and season) suggest the Mine is increasing nutrients in Lac de Gras. In 2018, the total phosphorus concentration was elevated above the normal range in a very small area of the lake (i.e. 0.5%). The extent of effects from total nitrogen was around 40.8% of the lake area, and on small plants and bugs in the water column, the extent of effects was 16.8% and around 12.8% of the lake, respectively. The extent of effects on chlorophyll *a* was estimated as 14.7% of the lake area.

  The 2018 plankton data do not suggest that adverse effects are occurring in Lac de Gras. Results are consistent with nutrient addition, as demonstrated by increase in small plants and bugs in the water column near the mine.

2017 Observations:

- Sixteen water quality parameters showed an early-warning indicator of effects in Lac de Gras. Three additional variables (i.e., ammonia, lead and tin) were added to a list of substances of

interest in 2017, because possible effects of dust were seen in lake areas a short way from the mine. The Regulated effluent parameters from the Water License were all below requirements.

Elevated amounts of nutrients extending to various distances from the Mine (depending on variable and season) suggest the Mine is adding nutrients to Lac de Gras. In 2017, total phosphorus was above the normal range in 1.1% of the area of Lac de Gras. Effects on total nitrogen were seen in about 41.9% of the lake area. Effects on phytoplankton was 19.4%, while that for zooplankton weight was less than 0.6% of Lac de Gras. Effects on chlorophyll *a* was estimated at around 26.2% of the lake area.

These results show that nutrient addition is happening in Lac de Gras, however there is nothing that shows a toxic effect in Lac de Gras from mine operations. There was no clear pattern to show if increased nutrients followed the plume of water discharged from the mine's water treatment plant. For zooplankton there was a clear pattern showing decreasing amounts further from the mine's discharge. The results also indicated that there are different types of species that are seen closer to the mine.

2014-2016 3-year Summary Report Observations:

- The treated water that is put back in the lake has been tested between 2002 and 2016 and it was found to be generally not toxic when tested with fish and tiny animals that live in the water column. Over 700 toxicity tests were done during this period. The treated water from the mine continues to meet the requirements for quality described in the Water License. The importance of an effect was calculated by comparing the water chemistry in different areas in the lake to the background values (what is considered 'normal' for Lac de Gras) and Effect Benchmarks (similar to a water quality guideline) as well as by reviewing trends to see if amounts were higher or lower over time. Background values for Lac de Gras are those that fall within what is called the "normal range". The normal range describes the natural differences that are found within the chemistry of a lake that hasn't been impacted by development. An amount that is greater than the normal range would not be considered normal for Lac de Gras, but it also doesn't mean that it is harmful. Effect Benchmarks (similar to water quality guidelines) are a better way to measure when a chemical may be harmful to animals that live in the water. Concentrations of total dissolved solids, chloride, fluoride, calcium, potassium, sodium, and sulphate in Lac de Gras were greater than the normal ranges in both the ice-cover and open-water seasons, and are generally increasing over time. This increase matches up with the amounts of these chemicals we measure in the mine's treated water discharge. Water quality results from 2015 and 2016 also showed the effects of the A21 dike construction on the water closer to the mine. Results from the west side of the lake show possible cumulative effects in this area because of the Diavik and Ekati mine discharges. However, the amount of these chemicals in the affected area of Lac de Gras remain low and were not seen in all years of monitoring. The majority of chemicals with Effects Benchmarks had levels below those values from 2002 to 2016 in the area where the treated mine water discharge mixes with the lake water.

Nutrient levels remain low throughout Lac de Gras, though chlorophyll *a* (which uses sunlight to help plants in the water grow) and plankton (small plants and animals that live in the water) show effects related to increased nutrients closer to the mine. The amount of nitrogen has been above the normal range in over 20% of the lake since 2008, with up to as much as 84% of the lake area being considered as affected in 2016. The area with greater amounts of chlorophyll *a* has also increased between 2007 and 2016, to over 40% of lake area. The EA predicted that the amount of phosphorus would not exceed 5 micrograms per litre in more than 20% of the area of Lac de Gras. So far, this prediction has been exceeded twice during the ice-cover season (2008 and 2013), but it has never been exceeded during the open-water season.

The sediment quality component of the AEMP measures chemicals in the mud at the bottom of the lake. Seventeen chemicals measured in sediment from 2007 to 2016 had greater amounts in areas closer to the mine when compared to areas further from the mine. However, none of these were in amounts above guideline values for protecting plants and animals that live in or near the sediments.

The plankton component of the AEMP evaluated whether there were any changes happening to the tiny plants and animals that live in the water in Lac de Gras. Changes in plankton can affect fish in the lake because fish eat them, and changes in plankton can happen before fish are affected. Differences in the plankton communities between areas closer to and further from the mine have been seen every year between 2007 and 2016. Conditions in Lac de Gras are suitable for growth of healthy plankton communities. Overall, the changes to plankton communities in Lac de Gras continue to reflect the increase in nutrients closer to the mine.

The benthic invertebrates component of the AEMP looks at whether the treated mine water put back into Lac de Gras has caused changes over time in the numbers and types of small bugs that live on the bottom of Lac de Gras. Benthic invertebrates include snails, clams, worms and insects. These bugs are food for fish and changes in the numbers and types of them can eventually cause changes in the numbers and types of fish in the lake. Effects of nutrient addition have also been observed for the bugs on the bottom of the lake, but recent results suggest a weakening of this effect.

Slimy Sculpin, which is a small fish that lives and stays in small local areas, that live close to the mine are generally smaller in size than those that live farther from the mine. The fish living close to the mine have stayed the same size over time, which suggests that the reason for the size difference is other factors (like fish habitat). For example, water temperature is colder closer to the mine and gets warmer farther from the mine; this might make some fish grow more slowly in the near-field area. In general, while there are some small differences in fish size, fish are healthy overall, and able to grow and reproduce.

The weight-of-evidence section of the AEMP combines the information and conclusions of the sections of the AEMP report that look at lake and treated mine water quality, eutrophication indicators (signs of increased nutrient availability), sediment quality on the lake bottom, tiny plants and animals that live in the water, bugs that live on the bottom of the lake and fish health. It tries to summarize the overall health of the lake when all of these things are considered together. A process was used to estimate the strength (or weight) of evidence (proof) for nutrient addition or toxic effects occurring in Lac de Gras from 2007 to 2016 (Figure 6). Overall, there is strong evidence for nutrient addition in Lac de Gras and weak evidence that toxic effects are occurring. This will next be updated as part of the 2017-2019 AEMP Re-evaluation Report.

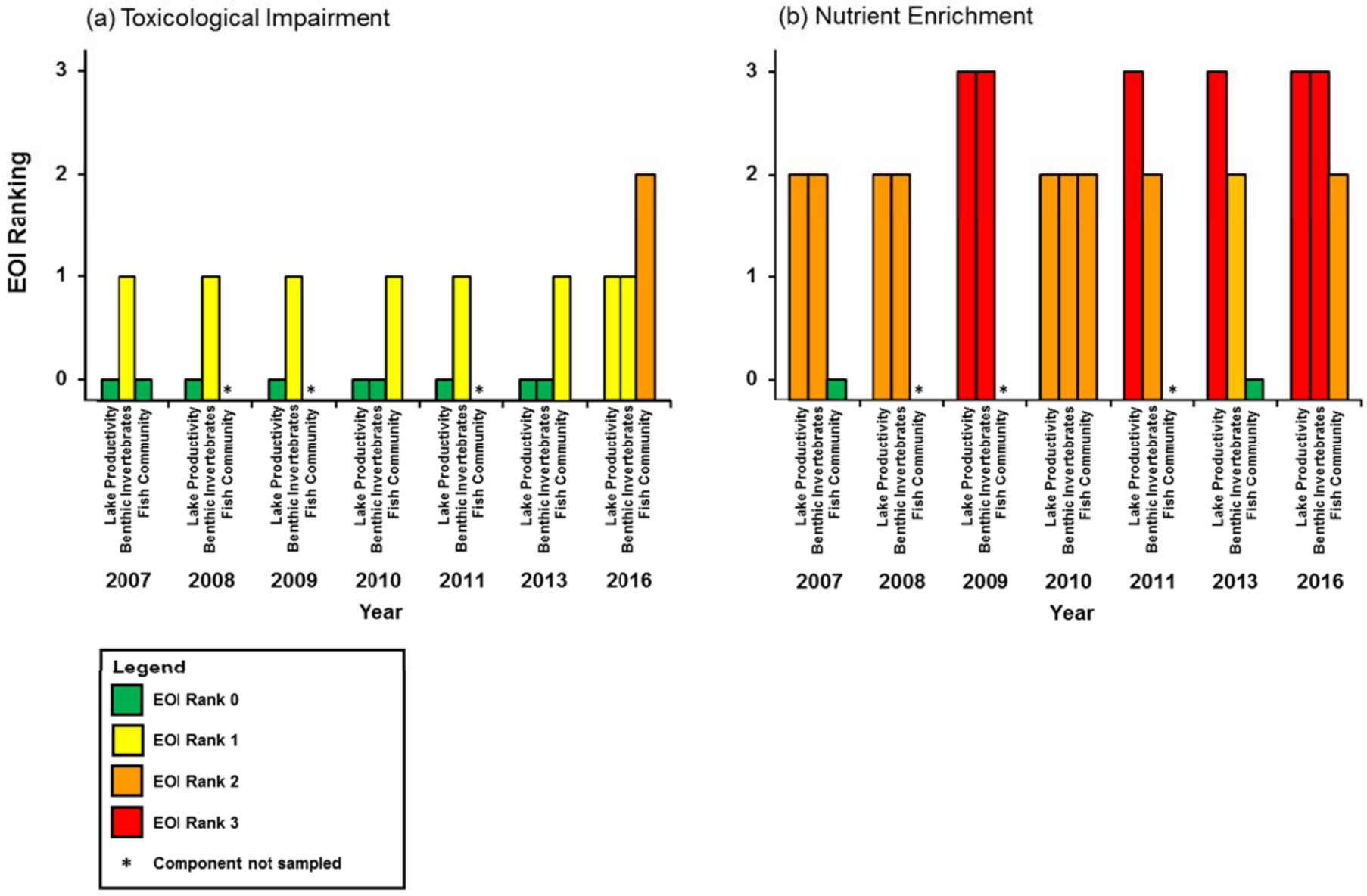


Figure 6 **Weight-of-Evidence Summary (2007-2016).**

Updates to the AEMP Design (the document that describes what, when, where and how to sample the lake) and the Reference Conditions Report (the document that says the amount of each substance that is considered typical for Lac de Gras) were put forward in response to the results from the 3-year evaluation. This includes: studying mine-related effects by looking at trends across the lake (instead of comparing area results from near the mine and farther from the mine), changes to the number and location of sample points farther from the mine, changes to how Action Levels are evaluated and explained and minor updates to the list of what is tested for at the lab. The sampling schedule for tiny plants and animals that live in the water column has been changed to every year in the middle of the lake (it used to be once every three years), so that they can look at possible effects on tiny plants and animals in the main body of the lake on an annual basis.

2016 Observations:

- As noted in the 2015 EAAR, AEMP report submissions have been off schedule the past few years to address some information requested by the WLWB. As such, the 2016 EAAR includes AEMP updates for the 2015 and 2016 AEMP Annual Reports. The 2015 AEMP Annual Report was submitted to WLWB on 15 September 2016 and the 2016 AEMP Annual Report was submitted on 31 March 2017; both reports had not yet been approved by the end of 2016. Diavik developed a Reference Conditions Report (2015) that is used to calculate and record the expected range of values for water quality parameters so that these can be used for comparisons in AEMP data calculations going forward. It also provides reference area (natural background) levels for the lake. The 2015 and 2016 monitoring was based on the AEMP Study Design Plan, Version 3.5 (2014). This document describes the sampling program and actions to take in response to findings. Diavik submitted an updated version of the AEMP Study Design Plan (V4,) and the Quality Assurance Project Plan (V3, the document that describes the care taken in field, lab and data analysis procedures to provide reliable results) to the WLWB in July 2016. Approval of these documents was still pending at the end of 2016. Lastly, the 2014-2016 Re-evaluation Report, which summarizes AEMP findings to date on a 3-year basis, is due 6 months after approval of the 2016 AEMP Annual Report. Key results from the 2016 program are outlined below.

  Dust deposition rates in 2016 were higher than in 2015 because of A21 dike construction activities. Deposition rates were highest close to the Mine infrastructure and decreased with distance from the Mine. The effluent (treated water discharged from the water treatment plant) water quality limits in the Water License are often used as a comparison for snow water quality and the 2016 results were lower than those stated in the license.

  Mine effluent triggered Action Levels (which are considered an early-warning of possible effects in the area close to the mine) for 15 water quality variables, including turbidity, calculated total dissolved solids (TDS), calcium, chloride, sodium, sulphate, nitrate, aluminum, copper, lead, manganese, molybdenum, silicon, strontium, and uranium. Based on the amount of the following substances found in the treated mine water, eleven additional variables - total suspended solids (TSS), bismuth, chromium, cobalt, fluoride, iron, nitrite, thallium, titanium, vanadium, and

zirconium - were added to the list of parameters to watch for in Lac de Gras (also called Substance of Interest, or SOI). Action Levels, explained in the Design Plan, are triggered well before unacceptable effects could occur. Regulated effluent parameters were all below applicable effluent quality criteria (EQC) in the Water License. The 2016 effluent toxicity results indicated that the effluent discharged to Lac de Gras in 2016 was generally non-toxic.

Increased amounts of nutrients moved across the lake to reach various distances from the Mine (depending on the type and season), and concentrations of chlorophyll *a* were higher than the top of the normal range in areas close to the mine. This suggests the Mine is having a nutrient enrichment (increase) effect in Lac de Gras. In 2016, 6.5% of Lac de Gras was considered affected with respect to total phosphorus (TP) concentrations, the extent of effects on total nitrogen (TN) was 84.7% of the lake area and that for chlorophyll *a* was 43.7%. This triggered an Action Level response, as noted in the AEMP Design Plan, and a Response Plan is being developed.

The 2016 phytoplankton (tiny plants that float in the water) results show no signs of a Mine-related effect in Lac de Gras. However, zooplankton (tiny animals that float in the water) results suggest that changes are occurring in areas near the mine may be related to an increase in nutrients. Phytoplankton and zooplankton biomass (the total weight of these tiny plants and animals) was 13.0% and 0.5%, respectively, of Lac de Gras. The amount near the mine remained within the normal range of values expected for zooplankton and this tells us that the reason for the decrease is not likely to be contamination. An Action Level response was triggered because the amount of zooplankton close to the mine was lower than it is farther from the mine (the opposite of what would likely be expected) and DDMI plans to investigate the cause for this.

Nine sediment (mud on lake bottom) quality variables in the area near the mine were in amounts greater than areas far from the mine, including TN, bismuth, lead, molybdenum, potassium, sodium, strontium, tin, and uranium. These variables were added to the list of parameters to watch for in Lac de Gras. There are no Action Levels for sediment quality. Based on published studies and available sediment quality guidelines, concentrations of bismuth, lead, and uranium encountered in sediments near the mine are unlikely to contaminate species of plants and fish.

Differences in the benthic invertebrates (small bugs that live on the bottom of the lake) between the area close to the mine and those areas far from the mine demonstrated a slight response to increased nutrients. Greater densities (amount of bugs in a given space) were observed closer to the area where treated mine water flows back into the lake and there were a lot more midges in this area when compared to areas further from the mine. Species evenness (how close the number of each species is in different areas) was affected by the number of midges near the mine and this triggered an Action Level response to investigate the cause and confirm the effect. The average values for all of the measurements taken for lake bottom bugs close to the mine were within expected levels.

Overall, the weight of evidence evaluation showed more of an environmental response to increases in nutrients in Lac de Gras rather than signs of a contamination response. There appears to be a clear link between nutrient releases (i.e., TP and TN) to Lac de Gras from the treated Mine

water resulting in greater amounts of nutrients and lake productivity at areas closer to the mine. There was also a response that showed more and different distributions of bugs (midges) that can be linked to increased nutrients. Although there are differences between the areas closer to and farther from the mine for nutrients, there appears to be little effect on the ability of the lake to support and maintain its health.

2015 Observations:

Dust deposition rates in 2015 were higher than in 2014. Deposition rates were highest close to the project infrastructure and decreased with distance from the Mine. The effluent (treated water discharged from the water treatment plant) water quality criteria in the Water License are often used as a comparison for snow water quality and the 2015 results were lower than those stated in the license for all except one sample (which was taken from an incorrect location).

The treated water discharged back into Lac de Gras had an effect on 17 water quality parameters (total dissolved solids [TDS, calculated], turbidity, calcium, chloride, potassium, sodium, ammonia, nitrate, aluminum, antimony, chromium, copper, molybdenum, silicon, strontium, uranium and vanadium). The concentrations of these variables in the area near the mine were higher than those measured further from the mine (reference area). As a result, an Action Level response, explained in the AEMP Design Plan, was triggered. These are considered as early-warning signs of possible effects in the area close to the mine and are triggered well before unacceptable effects could occur.

Results from water quality sampling suggest that the Mine is causing a slight increase in nutrients, as also reported during previous years of monitoring. Higher amounts of total phosphorus (TP) and total nitrogen (TN) were observed in the areas near the mine when compared to areas further away from the mine. Less than 20% of the lake area had concentrations of chlorophyll *a* higher than the normal range. This also triggered an early-warning Action Level response in relation to nutrient levels.

The 2015 plankton (small plants and animals living in the water) monitoring results suggest that zooplankton communities in Lac de Gras are exhibiting a Mine-related effect in response to increased nutrients, consistent with the results for water quality. The 2015 plankton results provided no direct evidence of contamination, as all measurements taken were within normal levels. However, the total weight of small plants in areas near the mine was lower than those further from the mine. This triggered an Action Level response for possible contamination and the presence of this early warning change will be confirmed during the 2016 AEMP analysis.

2014 Observations:

As noted in the 2014 EAAR, the Annual AEMP report submission was delayed due to a request for further information from the WLWB. An updated version of the 3-year (2011-2013) Summary Report of the AEMP was submitted to the WLWB in April 2016, and the 2014 AEMP Annual Report was submitted on 31 March 2016. The development of the Reference Conditions Report for Lac de Gras is the main reason for these delays. It is a report that calculates and explains the background (natural) water quality and allows regulators to better determine the level of any

effect on the lake. As such, the updated 3-year Summary Report and the 2014 Annual report are summarized in this section. The 2015 Annual AEMP Report as well as Version 4 of the AEMP Design document are both due on 30 June 2016.

Water quality tests showed that there were 19 elements that had amounts over two times higher close to the mine when compared to samples taken further away in Lac de Gras. Eight of these were also above what is considered the normal range for their concentrations in Lac de Gras. Diavik is taking the appropriate actions outlined for such a response, as detailed in the approved Action Level Framework for water chemistry.

Nutrient addition to the lake, as measured by nitrogen, phosphorous and parts of algae concentrations, continued to show mild enrichment (an increase in nutrients) close to the mine compared to other areas farther from the mine. The small plants and animals that live in the water column (plankton) have increased in light of the increased nutrients, and tests do not show signs of harm (toxicological impairment) to the number or types of organisms that are present.

2011-2013 3-year Summary Report Observations:

Below is a summary of the updated findings for each of the monitoring activities included in the Aquatic Effects Monitoring Program, and it focuses on results from 2011 to 2013.

- The treated water that is discharged back into Lac de Gras has shown changes in quality over the years. For example, salts such as calcium and chloride have decreased since 2010. Some metals have increased over time (molybdenum, strontium), however most have decreased (aluminum, barium, copper, manganese) or stayed the same (chromium, uranium, antimony, silicon). The tested mine effluent has continued to meet water license criteria. Additionally, most of the effluent tested over the years has been non-toxic, with over 500 toxicity tests conducted since 2002.

- A total of 25 different chemicals had levels that were greater near the mine versus further away. Of these, 14 had higher levels than what is considered normal for Lac de Gras, but this does not necessarily mean that it is harmful. None of the chemicals tested were higher than what are called benchmark values, which measures when a chemical may be harmful to aquatic life. With the exception of chromium in 2004 and 2006, water quality has remained below the guidelines for protection of aquatic life throughout the life of the mine.

- Increased productivity (eutrophication) was a predicted effect for Lac de Gras because groundwater and treated mine water would introduce more nutrients into the lake. This is why monitoring nutrients (phosphorous and nitrogen) and algae growth (determined by measuring chlorophyll *a,* the green pigment in algae) is important to measure over time. Concentrations of nitrogen and have been higher than the normal range in over 20% of the lake since 2008 and chlorophyll *a* had the same results in 2009 and 2013. Phosphorus was predicted not to go over 5 micrograms per litre in more than 20% of Lac de Gras; this level

has only been exceeded twice during ice cover in 2008 and 2013, and never during open water.

Plankton (small plants and animals that live in the water column) are monitored because they are part of the food chain and changes in their population may be seen before any impacts are noted in fish. Since 2007, the amount of plankton has consistently been higher closer to the mine versus farther from the mine. Monitoring has shown that the mine is not having a harmful/toxicological effect on plankton. Changes to the type of plankton are being seen throughout Lac de Gras, suggesting that a natural change is also occurring. The number of small animals in the water (zooplankton) peaked in 2011 and has decreased since then, but has still been greater than the normal range for Lac de Gras since 2007. The amount of phytoplankton (biomass of small plants) was greater than the normal range in more than 20% of the lake in 2009 and 2011.

- Sediment samples showed that 15 metals were deposited onto the lake bottom near the mine in greater amounts than are present in areas of the lake farther from the mine. To date, the amount of metals present has stayed below the guideline that protects animals living in the lake bottom sediments. Concentrations of bismuth, lead and uranium increased near the mine from around 2002 to 2008, and it is thought that the construction of the dikes may have contributed to this increase. The amount of these metals in sediments has remained the same since 2008 and have not exceeded Soil Quality Guidelines.

- Benthic invertebrates (bugs such as snails, clams, worms and insects that live in the sediment on the bottom of the lake) are studied because they are food for fish. Since 2008, the number of bugs close to the mine has been higher than areas farther from the mine, but they are within the normal range for the lake. The types of these bugs have changed over the years, but similar to the findings with plankton, a change over time has also been seen in the reference areas and suggests that natural changes occur over time.

- Small (slimy sculpin) and large (lake trout) fish are sampled from Lac de Gras. Small fish are good to sample because they tend to live in one area. Large fish are good to sample because they are the top of the food chain and of value to community members. Results from small fish samples have consistently showed increased levels of lead, strontium and uranium even though water quality levels for these chemicals are not of concern. Outside of this, there have been no consistent trends in differences between small fish close to the mine when compared to those further from the mine. Lake trout flesh samples have shown an increase in mercury concentrations, but this has also been observed in fish from Lac du Sauvage, and other areas in the north. Traditional Knowledge studies have shown that the taste and texture of the fish in Lac de Gras has not changed over the years the mine has been operating.

- A weight-of-evidence (refer to Definitions section) uses all of the above information in a qualitative process where professional scientists assess the strength of all the results in determining possible nutrient enrichment or harmful/toxicological impacts from the mine. There was strong evidence for nutrient enrichment and weak evidence for toxicological damage from 2011 to 2013. The effect of nutrient enrichment in Lac de Gras extends over approximately 20% of the lake, as was predicted in the 1998 Environmental Assessment.

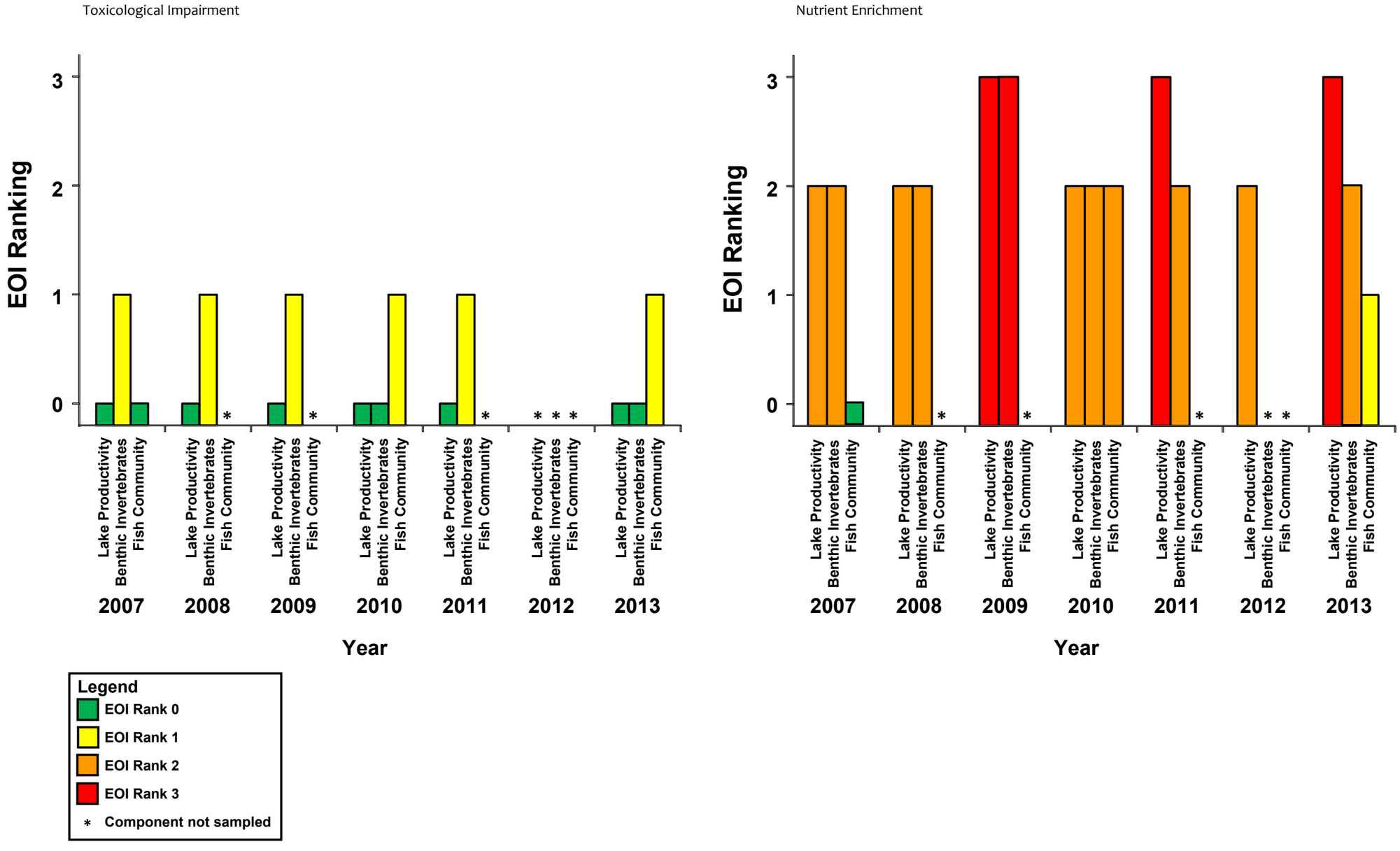


Figure 7 Overall Ranking of Effects (EOI = evidence of impact).

2013 Observations:

Revisions to the Aquatic Effects Monitoring Program design resulted in a more in-depth program being conducted on a 3-year cycle for the AEMP, and 2013 was a year where the majority of sampling requirements for the program were conducted. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge continue to increase in Lac de Gras, near the East Island.

- Mine effluent had an effect on 15 water quality variables and the amount of chemical in each sample was highest close to the mine and lowered with increasing distance from the mine.
- Results relating to eutrophication indicators (chemicals and small plants that show early signs of increasing nutrients) suggest that the mine is causing an increase in nutrients in Lac de Gras as there were greater concentrations of some nutrients and small plants closer to the mine versus further from the mine. For example, algae (chlorophyll *a*) concentrations were higher than the normal range for Lac de Gras, and the higher amount of algae was found in over 20% of the lake. The approved AEMP (v3.3) has established an Effects Benchmark for chlorophyll *a* at a concentration of 4.5 µg/L; current results are below this value .

  The 2013 monitoring results for plankton communities (tiny plants and animals) in Lac de Gras suggest that there is a mine-related increase in nutrients because there was a difference in the amount and type of them in the exposure area (close to the mine) when compared to the reference areas (further from the mine). There was however no evidence of toxicological damage, so no Action Level has been reached.

- Effects of the mine discharge on bottom sediments (mud at the bottom of the lake) in the exposure area of Lac De Gras were evident for 13 metals, as areas near the mine had higher average amounts than those further from the mine. Of these 13 metals, three had average amounts that were higher than what would normally be found in the lake. When comparing these results to sediment quality guidelines, it is unlikely that the amounts found in Lac de Gras sediments would be harmful to fish and plants.
- Differences in the total amount of benthic invertebrates (small bugs that live on the lake bottom) were noted between the exposure area (close to the mine) and reference areas (further from the mine). This suggests an increase in nutrients, rather than a harmful effect, so no Action Level was reached. Benthic invertebrates are measured by density, which means counting the number of animals in a given area.
- The Weight of Evidence assessment is meant to rank impacts to Lac de Gras using the data collected by the AEMP, as summarized in the bullet points above and in the Fish section below. Impacts from different parts of the program (e.g. Fish Health) are rated as being: negligible/none (score of 0), low (1), moderate (2) or strong (3). They are also categorized as either 'toxicological' (harmful response) or 'nutrient enrichment' (increased nutrients).

Table 6: Weight-of-Evidence Results, 2013 AEMP.

Ecosystem Component	Rating
Toxicological Impairment	
Lake Productivity	0
Benthic Invertebrates	0
Fish Population Health	1
Nutrient Enrichment	
Lake Productivity	3
Benthic Invertebrates	3
Fish Population Health	1

- During 2013, a batch of preservative that is provided by an external lab and added to water samples prior to shipping was found to be contaminated. After investigation, a total of seven metals (cadmium, chromium, cobalt, iron, manganese, molybdenum, and nickel) were found to be in higher concentrations than normal when the contaminated preservative was used, starting in July 2013. Further tests were then done to determine which sample results were incorrect because of this contamination. These seven metals from a total of 114 specific samples (21 samples from 1645-18, 24 samples from 1645-19 and 69 samples from the open water AEMP) were removed from the 2013 AEMP and SNP datasets, and these values were also not used in any analyses.

2012 Observations:

The Aquatic Effects Monitoring Program was successfully revised before the 2012 monitoring season so only certain aspects of water quality and fish monitoring were conducted. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing some enrichment in Lac de Gras, near the east island. A Traditional Knowledge study on fish and water health was also conducted as part of the AEMP during the summer of 2012.

Specific results of note from the 2012 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2012 AEMP field program and from relevant sites from the Water License SNP program stations indicated similar trends as observed in 2011, including an increase in arsenic and iron concentrations.
- Results to date of the plankton monitoring program, which examines changes in the amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras (LDG), indicate a pattern consistent with weak nutrient enrichment from mine effluent.

- Results of the eutrophication indicators component of the AEMP were similar. Based on the measured higher amounts of phytoplankton (chlorophyll *a*) and total phosphorus (TP) in the near field area relative to the reference areas, the observed enrichment effect has been given a "moderate" effect level designation. Zooplankton biomass resulted in a "low" effect level designation. More specifically, the area of the lake that has been affected was 24% of LDG for Chlorophyll *a* and less than 1% for TP in 2012.
- Toxicity testing on the treated mine water that is discharged back to Lac de Gras was done four times in 2012, as part of the SNP program in the Water License. No concerns or issues were noted with any of these tests.
- The results from the 2012 TK camp provided feedback on the context and process for sharing Traditional Knowledge as well as on the health of the fish and water in Lac de Gras. Camp participants noted the importance of TK's context, which is situated in, and interconnected with spirituality (e.g., human-animal transformations), codes of conduct (e.g., respect for and obedience of one another), and connection to the land, animals, and ancestors. Customs and practices (e.g., drumming, feeding the fire and water) and stories about the journey-based creation of unique landscape features (e.g., mountains, islands, and waterbodies) underscore this context of TK. So, the importance of the setting in which knowledge is shared and of being respectful to others becomes important to ensure proper transfer of knowledge.
- TK camp participants noted the environmental indicators that they use to assess water quality, such as condition of the shoreline and clarity of the water. Additionally, a tea test was used to assess water quality and participants noted that tea made from water of a poor quality results in film or scum on the surface of the cup. None of the water samples from Lac de Gras had this scum or film and all the samples tasted acceptable to participants.

2011 Observations:

Overall, the 2011 program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild enrichment in the bay east of East Island. Specific results of note from the 2011 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the AEMP field program and from relevant sites from the Water License SNP stations continued to show a low level effect on water chemistry in the lake resulting from the mine.
- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect terms, from no effect to a high level effect, depending on what was analyzed. Low level or early-warning effects were detected for some species between the reference areas and exposure areas. Effects on total density (amount) and other benthic species density were classified as moderate level. A high level

effect was found for the amount of one species. Benthic invertebrate monitoring results show effects of mild nutrient enrichment.

- Results to date of a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras show a pattern consistent with nutrient enrichment from the mine. Based on the measured higher amounts of algae (chlorophyll *a*) and total phosphorus near the mine versus farther from the mine, this effect remains at a "moderate" level effect designation. Higher zooplankton biomass near the effluent continued to result in a "high" level effects designation.
- Moderate nutrient enrichment from the mine water discharge has been shown for 15.5% of Lac de Gras, based on the amount of algae and phosphorous measured in the lake. This is below the predicted level of 20%.
- Results of the Lake Trout study suggest that there has been a slight increase in mercury in Lake Trout muscle tissue since 2005. This increase is seen in both Lac de Gras and Lac du Sauvage. The increase in mercury from before the mine was built resulted in a low level effect classification.
- A technical analysis confirmed the nutrient enrichment effect and concluded that there continues to be strong evidence for a mild increase in lake productivity, and associated enrichment of the benthic invertebrate community, as a result of nutrient increases in Lac de Gras. There is some evidence suggesting low-level impairment to the small organisms on the bottom of the lake due to contaminant exposure but these findings have a high uncertainty because the link to contaminant exposure is not strong. The slight increases in mercury levels in fish tissue since 1996 have occurred in both Lac de Gras and Lac du Sauvage (upstream from the mine), and it is not likely that the increase is linked to mine operations. Diavik continues to monitor mercury levels in big and small fish in the lake, as well as monitoring for other possible sources of mercury. This helps to try and find out what may cause any increases that do happen and catch any possible issues.

2010 Observations:

Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild enrichment in the bay east of East Island. Specific results of note from the 2010 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the AEMP field program and from relevant sites from the Water Licence SNP stations showed a low level effect on water chemistry in the lake resulting from the mine.
- Results of the sediment analysis did not identify conditions that are likely to affect fish, bug or plant life in the lake through enrichment or harm. Bismuth and uranium were, however, assigned "high level effects" designations as both areas near the mine and at least one halfway

down the lake had average concentrations greater than the areas farther from the mine. Measured levels of bismuth and uranium are unlikely to pose a risk to fish, bugs, or plant life.

- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect terms, from no effect to a moderate level effect, depending on what was analyzed. Low level or early-warning effects were detected based on statistical differences between the reference areas and exposure areas. Effects on total density and other benthic species density were classified as moderate level. Early-warning/low level effects were detected for the amount, distance, and density of one species. Benthic invertebrate monitoring results are indicative of nutrient enrichment.
- A study was completed in 2010 to determine the approximate area the treated effluent (a "plume") covers in Lac de Gras. The plume extent was similar between summer open-water and winter ice-cover conditions, but concentrations near the discharge point were higher during winter ice-cover conditions.
- One possible explanation for the 2007 finding of elevated mercury in small fish (Slimy Sculpins) was increased mercury being released from sediments because of nutrient enrichment from the treated mine effluent. A sediment core study was done to look in to this and it showed that this explanation was not likely, based on the results.
- Results to date of a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras indicate a pattern consistent with nutrient enrichment from treated mine effluent. Based on the measured higher amounts of algae (chlorophyll *a*) and total phosphorus near the mine versus farther from the mine, this effect has been given a "moderate" level effect designation. Higher zooplankton biomass near the effluent resulted in a "high" level effects designation.
- Results for the small fish study indicate a pattern consistent with an increased availability of food and nutrients in the sampling areas near the mine compared to the areas farther from the mine. Despite the moderate-level effects seen in the fish tissue chemistry for bismuth, strontium, titanium, and uranium, there was no evidence that tissue metals concentrations were negatively affecting fish health.
- Mercury levels in small fish (Slimy Sculpin) at sampling sites near the mine were lower than reported in the 2007 AEMP. There was no significant difference between samples taken near the mine and those taken farther away from the mine in 2010, most importantly in relation to tissue concentrations of mercury. The reason for the differences between the 2007 AEMP results for mercury and the 2010 results is unknown; however, a different analytical laboratory using slightly different methods was used in 2010.
- A technical analysis confirmed the nutrient enrichment effect and concluded that there is strong evidence for a mild increase in lake productivity, and associated enrichment of the benthic invertebrate community and fish community, as a result of nutrient increases in Lac de Gras. There is little evidence of harm to lake productivity as a result of any contaminant

exposure. Although there is some evidence suggesting potential low-level contaminant issues with benthic invertebrate and fish communities, these observations have a relatively high amount of uncertainty.

2009 Observations:

Similar to 2008, the 2009 Aquatic Effects Monitoring Program showed nutrient enrichment (increased levels of phosphorous and nitrogen in the water available for algal growth, where increasing algal growth is a sign of eutrophication, or increased lake productivity) in areas of the lake. Nutrient enrichment is the main change in Lac de Gras that leads to most of the other changes we see relating to the different animals that live in the water. Specific observations that were noticed in the 2009 data include:

- The analysis of effluent (treated water discharged back in to the lake) and water chemistry (quality) data collected during the 2009 AEMP field program and from relevant stations from the Water License Surveillance Network Program stations indicated an early warning/low level effect on water chemistry within Lac de Gras resulting from the Mine. This means that there is a difference between samples taken near the mine and those taken farther away from the mine, but is within the expected range. Some values may be slowly increasing over time, though, so it is important to monitor for any changes that may occur from one year to the next.
- Results of the sediment analysis did not identify conditions that are likely to affect aquatic life through enrichment or impairment. Most of the metals and nutrients measured in the sediment had an early warning/low level effect on sediment chemistry. However, bismuth was assigned a "high level effect" designation; this means that samples near the mine and at least one sample part way across the lake had average concentrations that were higher than those of the reference area at the other end of the lake.
- Analysis of the number and types of benthic invertebrates (small organisms that live on the bottom of the lake) indicated a range of effect designations, from no effect to a high level effect, depending on what was analyzed. Low level/early warning effects were detected based on significant differences between the reference areas further from the mine and the exposure areas near the mine in eight of twelve benthic invertebrate community variables compared (variables include things like the number of species found, whether one species was found more than another, number of organisms in a given area, number of midges, etc.). Total invertebrate densities, as well as two species densities (Pisidiidae and Heterotrissocladius sp.) were higher closer to the mine than the range measured in areas farther from the mine. Densities of Pisidiidae near the mine and part way across the lake were greater than the range measured in areas at the other end of the lake; for that reason, it was assigned a high level effect. These results relate back to the nutrient enrichment happening in the lake.
- Findings to date on a special study to examine changes in amount, number, and types of zooplankton (tiny animals) and phytoplankton (algae) that live in the water of Lac de Gras show a pattern linked to nutrient enrichment from mine effluent. Because there are higher

amounts of phytoplankton (chlorophyll a/algae) and total phosphorus in areas near the mine compared with areas farther from the mine, this effect has been given a "moderate" level effect designation. Higher zooplankton biomass (the amount of small animals in an area) near the effluent resulted in an early warning/low level effect designation; this means that there is a difference between the areas closer to and further from the mine, but that it is within the expected range.

- A weight-of-evidence (WOE) analysis compares all the information collected (water quality, sediment quality, benthic invertebrates, etc.) to try and answer two questions:
    - Could damage to aquatic animals happen due to chemical contaminants (primarily metals) released to Lac de Gras?
    - Could enrichment occur in the lake because of the release of nutrients (phosphorus and nitrogen) from treated mine effluent?

  The weight-of-evidence analysis confirmed nutrient enrichment and concluded that there is strong evidence for a mild increase in lake productivity due to nutrient enrichment. There was not a lot of evidence of damage to aquatic animals as a result of contaminant exposure. The observation of potential low-level harm of the benthic invertebrate community has a fairly high amount of uncertainty.

2008 Observations:

Overall, the 2008 Aquatic Effects Monitoring Program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild nutrient enrichment in the bay east of East Island. Nutrients are essential to the growth of plants and animals in land and in the water. Adding nutrients to natural waters can result in increased production of plants or algae. Too many nutrients can cause environmental problems generally known as nutrient enrichment or eutrophication. These problems include increased oxygen consumption in the water by algae (fish need this oxygen too) and a reduction in the amount of light getting to plants at the bottom of the water body.

Special Effects Studies for mercury detection limits (measuring mercury at very low levels), chromium VI (a compound Diavik investigated because it could be a concern at lower levels compared to other forms of chromium) and trout fish tissue metals levels (based on previous AEMP studies that showed possible elevated level of metals in fish) were also completed. Other results of note from the 2008 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2008 AEMP field program and from locations around the mine site (from Surveillance Network Program) indicated a low level effect on water chemistry within Lac de Gras resulting from the mine.
- Results of the sediment analysis did not identify conditions that are likely to affect aquatic life through enrichment or impairment. Bismuth and uranium (metals) were however assigned "high level effects" designation as both near-field and at least one mid field area

had mean (average) concentrations greater than the reference area (sites far away from the mine) range.

- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect designations, from no effect to a high level effect, depending on the variable analyzed. Low level or early warning effects were detected based on differences between the reference areas (far away from the mine) and exposure areas (near the mine) in eight of eleven benthic invertebrate community variables compared. Density (number of individuals in a specified area) of the midge Procladius in the near-field area were greater than the range measured in the reference areas and was assigned a moderate level effect. Density of Sphaeriidae in the near-field and mid field areas greater than the range measured in the reference areas and was assigned a high level effect. Both results are indicative of nutrient enrichment.
- The fish liver tissue analyses from 1996, 2005, and 2008 has not indicated that there has been an increase in the concentration of metals, including mercury, in lake trout over that period and therefore a no effect classification has been assigned for lake trout usability.
- Findings to date on a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras indicate a pattern consistent with nutrient enrichment from mine effluent. Based on the measured higher amounts of phytoplankton (chlorophyll a) and total phosphorus in the near field areas compared with the reference areas this effect has been given a "moderate" level effect designation. Higher zooplankton biomass near the effluent resulted in a "high" level effects designation.
- Mercury and chromium VI levels in the treated mine water discharge, both subject of special studies in 2008, were determined to be at concentrations below the best analytical detection limits available.
- The AEMP confirmed that there is a nutrient enrichment effect and concluded that there is strong evidence for a mild increase in lake productivity due to nutrient enrichment. There is negligible evidence of impairment to lake productivity as a result of any contaminant exposure. The observation of potential low-level impairment of the benthic invertebrate community has a relatively high degree of uncertainty.

Special studies on dust sampling frequency, mercury detection limits, and chromium VI are now complete.

2007 Observations:

- Effluent and water chemistry data collected indicated a low-level effect on water chemistry within Lac de Gras from the mine.
- Lakebed sediment chemistry data indicated a potential low-level effect for lead, and a potential high level effect for bismuth and uranium on sediment chemistry within Lac de

Gras from mine activities, although benthic results suggest that sediment exposure concentrations are unlikely to pose risk to aquatic life.

- Benthic invertebrate analyses indicate a low-level nutrient enrichment effect on benthic invertebrates within Lac de Gras.
- The fish study indicated a pattern consistent with an increased availability of food and nutrients in near-field and far-field exposure areas compared to far-field reference areas. Elevated barium, strontium, mercury and uranium in slimy sculpin was assigned a moderate-level effect.
- Dike monitoring results revealed potential dike-related minor changes to water quality and concentrations of lead and uranium in sediment. Overall, analyses suggest benthic communities near the dikes are more likely responding to habitat variation than to changes in water quality or sediment chemistry.
- Eutrophication indicators showed a moderate-level nutrient enrichment effect within Lac de Gras, with the mine being a significant contributor to this effect.
- As with the previous year's results, despite the proximity of SNP Station 1645-19 to the effluent diffuser (60m), open-water and ice-cover water quality results remain within Canadian Council of Ministers for the Environment (CCME) Guidelines for the Protection of Aquatic Life.
- Ice-cover concentrations at SNP Station 1645-19 still tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water, resulting in better initial dilution or mixing.

2005/2006 Observations:

Due to pending changes to the AEMP, data reports were completed for the 2005 and 2006 programs, however, a report of the analysis and interpretation was not submitted.

2004 Observations:

- As with the previous year's results, despite the very close (60m) proximity of SNP Station 1645-19 to the effluent diffuser, open-water and ice-cover water quality results remain within Canadian Council of Ministers for the Environment (CCME) Guidelines for the Protection of Aquatic Life.
- Ice-cover concentrations at SNP Station 1645-19 still tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water, resulting in better initial dilution or mixing.
- As with the previous year, the results for several of the parameters indicated a possible change when the actual reason for the positive results was a low baseline statistic. There are also locations (LDG50) or parameters (nitrite at LDG46) where baseline data are not available and so the data analysis is not possible. Finally there are parameters where

baseline detection limits have dominated the baseline statistic and could result in changes not being detected.

2003 Observations:

- Despite the very close (60m) proximity of SNP Station 1645-19 to the effluent diffuser, open-water and ice-cover results remain within CCME Guidelines for the protection of aquatic life.
- Ice-cover concentrations at SNP Station 1645-19 tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water resulting in better initial dilution or mixing.
- The results for several of the parameters indicated a possible change when the actual reason for the positive results was a low baseline statistic. There are also locations (LDG50) or parameters (nitrite at LDG46) where baseline data are not available and so the data analysis is not possible. It is therefore recommended that in the future the data analysis method be modified so that the baseline references are from the combined mid-field and far field sites instead of each individual monitoring site. This change would reduce the number of false positives results.

2002 Observations:

- Water quality at all Lac de Gras monitoring locations, including sites immediately adjacent to effluent diffuser remained high.
- Increases from location specific baseline levels were measured for turbidity and suspended solids at 3 mid-field monitoring stations, however all remained within typical baseline values for the area.
- Predicted nutrient enrichment effects were not realized although phytoplankton biomass was determined to have increased over baseline at one far-field location but not at any mid-field locations.
- No trends or specific concerns were noted for zooplankton, benthic invertebrates and sediment quality, based on two sampling results.
- Snow chemistry results were all below discharge limits.

Previous Years Observations:

- Localized increases in turbidity, suspended solids and aluminum were measured due to dike construction.
- Water and sediment quality, zooplankton, phytoplankton and benthic invertebrate results were generally consistent with baseline, however some results, particularly benthic invertebrate numbers, showed larger year-to-year variability.

Fish

What effect will the mine development have on fish?

EA Prediction and Overall Status:

- ***On a regional scale the only effect on the fish population of Lac de Gras would be due to angling;***

Fish populations do not appear to have been impacted by mine operations.

- ***The effect of increases in metal concentrations in fish flesh would be negligible (i.e. metal concentrations in fish flesh would not exceed consumption guidelines (0.500 mg/kg for mercury);***

Since baseline, eleven (11) lake trout tissue samples have exceeded the .500 mg/kg for mercury and all were large fish (mercury is known to increase over time). An increased amount of mercury was detected in tissue from small fish (slimy sculpin) taken from the lake in 2007 but levels since then have remained normal.

- ***Mercury concentrations will not increase above the existing average background concentration of 0.182 mg/kg; and,***

The average mercury concentration in lake trout caught from Lac de Gras has increased above background concentrations of 0.182 mg/kg (year 1999 baseline) in some years but overall concentrations have not significantly increased in the last 24 years. Mercury in lake trout is naturally occurring as the Mine is not a source of mercury input to Lac de Gras. In general, larger and older fish naturally have increased mercury concentrations as mercury bio accumulates in fish tissue. The instances of fish caught with mercury levels above baseline are likely a combined result of aging fish populations, and the bioaccumulation (builds up in tissue) and biomagnification (levels increase up the food chain) effects of mercury.

- ***Local effects due to blasting, suspended and settled sediment from dike construction, increase in metal concentrations around dikes and post-closure runoff.***

Effects due to blasting and construction were minimal based on monitoring and research results; post-closure runoff cannot yet be assessed.

Observations:

AEMP TK Study of Fish Health

Traditional knowledge studies component of the Aquatic Effects Monitoring Program (AEMP) did not take place in 2019; however, the results of both the fish inspection and water tests for the 2018 AEMP Traditional Knowledge (TK) Study found that the scientific analysis supported observations made by TK holders that the present status of the fish and water in Lac de Gras is good. People appreciated experiencing the current state of the environment personally and evaluating both water and fish "with their own eyes". Elder and youth participants from each of the five (5) PA organizations acknowledged that it is also important to pair TK with science so that all aspects of the environment

can be understood to its full potential. Participants acknowledged Diavik's efforts to keep the fish and water healthy and expressed interest in seeing this monitoring camp continue into the future. The AEMP TK study includes up to 2 Elders, 1 youth and interpretation as required for each of the PA organizations and is conducted every three (3) years, with the next program planned for 2021.

In 2018, a total of 36 fish were caught from two locations (35 lake trout, 1 lake whitefish). When evaluating the fish during processing, people generally described the fish as healthy with typical gills, tissue, skin, scales, hearts, livers, pipes, eggs. Camp participants tasted four lake trout that they baked, boiled, fried, and grilled. The descriptions provided on the taste of each fish were positive and included: good, very good, healthy and typical. However, compared to previous years, participants suggested that the number of fish with cysts and worms (parasites) appeared to have increased. While some people recognized that parasites occur naturally and are present in fish within their communities, there was still an interest in trying to understand why fish in 2018 appeared to have more cysts than expected. During the Verification Session in December, results of documented cysts from previous years were compared with 2018 and did not show an increase. To date, systematic documentation of cyst presence was not done consistently; however, henceforth, more care will be given to tracking this indicator.

Camp participants reasoned that water quality was good by virtue of observing water clarity, movement, temperature, vegetation, fish activity and taste. Two sampling locations were selected, one near the lakeshore and another in deeper water, and tasting was carried out with consensus that the water is healthy. When asked, participants responded that they do not have any concerns or worries about water in Lac de Gras at this time.

Scientific samples to test for mercury in fish tissue were taken and results were compared against the Health Canada consumption guideline of 0.500 mg/kg of mercury in the edible portion of fish tissue (http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php); no samples exceeded this value during 2018 (Figure 8)

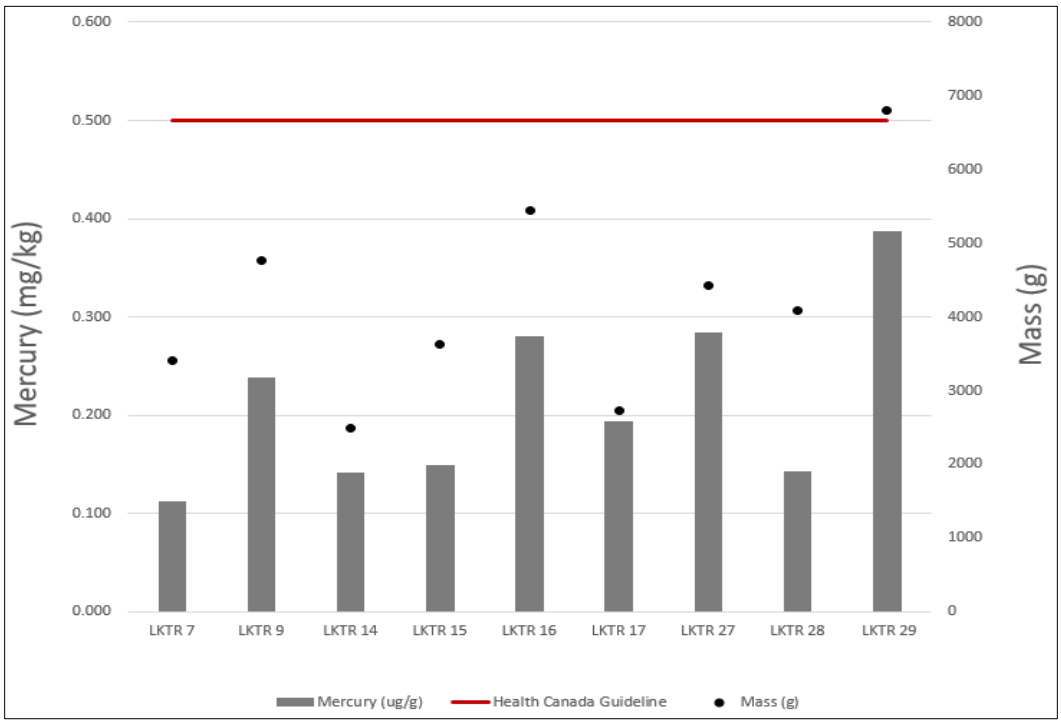


Figure 8 2018 Lake Trout mercury levels (Hg), age, and weight.

- Overall, participants in the 2015 AEMP TK Study commented that the present status of the fish and water in Lac de Gras beside the Diavik mine is good and better than they expected given how close it is to industrial activity.

- In 2015, a total of 31 fish were caught and 20 were Lake Trout while 9 were Whitefish (lake and round). Eight (8) fish were selected for inspection using TK and science. Of all the fish caught, only one fish was considered 'sickly' by participants due to its heart being smaller than usual and the presence of cysts on its liver. Participants chose to include this fish as part of the fish tasting. Four fish were officially tasted for the palatability study and all scored a 1 or 2 rating (i.e. this fish tastes excellent (1)/good (2) and tastes better (1)/similar (2) to fish we usually eat).

- Scientific samples to test for mercury in fish tissue were taken for 21 fish. Results were compared against the Health Canada consumption guideline of 0.500 mg/kg of mercury in the edible portion of fish tissue (http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php). Two fish slightly exceeded this value; both were large (over 4 kg), old (33 and 28 years) fish and mercury is known to increase in the body over time (Figure 9).

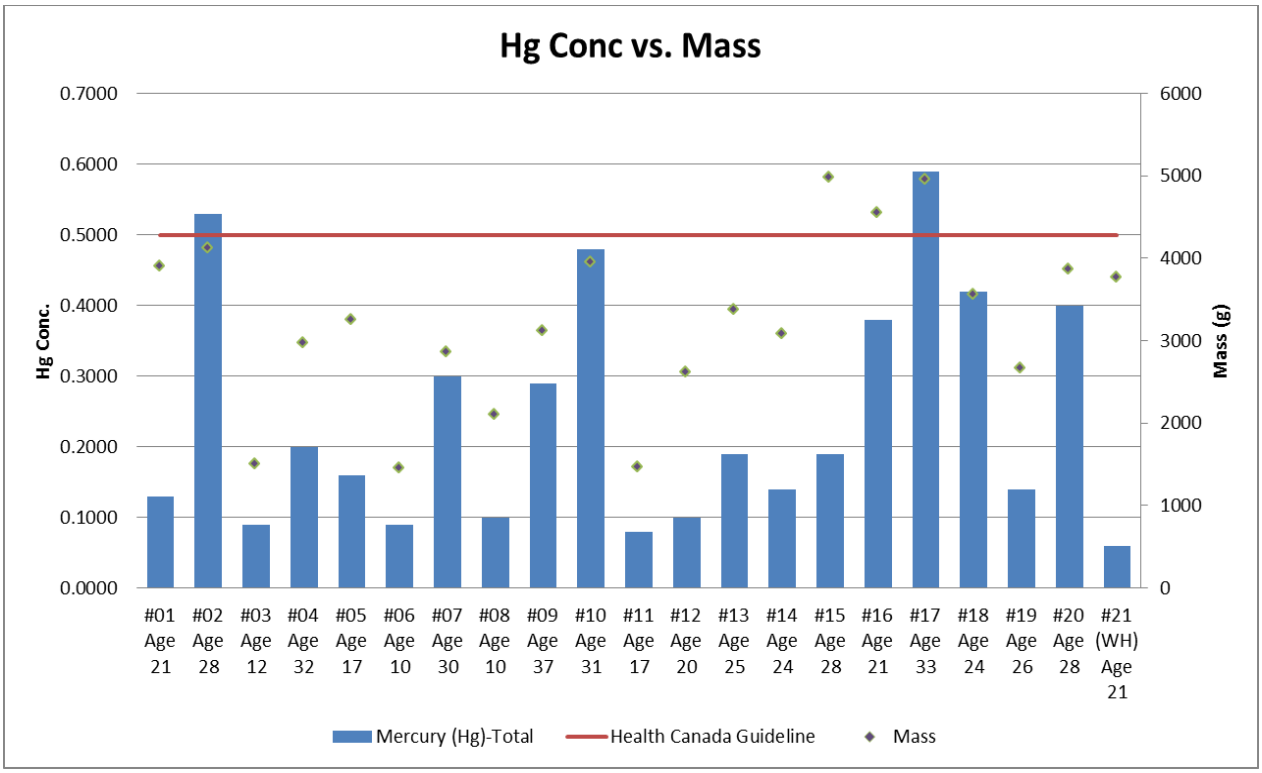


Figure 9 2015 mercury (Hg) levels for fish tissue based on age and weight.

Participants from the 2012 Traditional Knowledge fish camp, conducted as part of the AEMP, noted that the status of the fish in Lac de Gras near the Diavik mine is good. Thirty-nine fish were caught and, of these, two fish were identified as being of poorer condition, noting that these fish were skinny and, in the case of one, had a larger head. Another fish was also observed as having some intestinal worms and was of poorer condition. Participants noted that this tends to occur in all fish populations and that the fish are not eaten. Those that were tasted as part of the palatability study resulted in scores of 1 (excellent for eating, looks better than fish usually caught) or 2 (good for eating, looks similar to fish usually caught) from all participants.

- Based on the results of the 2008 trout survey, it was determined that mercury levels were safe for consumption so a fish palatability study was done in 2009. Four fish were cooked for tasting using the same methods as previous studies, and 10 fish tissue and organ samples were taken for metals testing, including mercury. Each of the four fish that were cooked for the palatability study also had metals samples submitted for testing. Results for the metals levels in the fish tested during the 2009 fish palatability study showed mercury levels below Health Canada's guideline for consumption and that fish were okay for eating.

From 2003 until present, the fish from Lac de Gras (LDG) have tasted good according to participants in the community-based monitoring camps that are held in some summers. Scientific testing for metals levels in fish tissue and organs that were caught during these camps were also as expected - the results have showed no concerns.

M-lakes and West Island Fish Habitat Restoration

These programs were started in 2009 in order to make up for the fish habitat lost to dike/pit construction. This is a requirement from the Department of Fisheries and Oceans. Streams in these areas were improved to encourage fish use and movement between smaller inland lakes and Lac de Gras. Construction was finished in 2012 and monitoring of these areas continued through 2013. Some retrofits were completed after the first year of monitoring, as one type of flow structure created was ineffective in sustaining a suitable depth and was not being used by fish. After these were re-sloped and some additional boulders were added, flows and depths became suitable to support fish use and fish were detected in these streams.

Slimy Sculpin

Small fish (slimy sculpin) sampled in 2019 in Lac de Gras were healthy and showed similar reproductive success and presence of internal and external abnormalities as in the 2016 fish sampling program. The presence of parasites, specifically tapeworms, varied at in different parts of the lake, but was not associated with closeness of fish sampling area to the Mine. Average values of all examined variables (signs) of fish health were within normal levels. There were observed differences in length, weight and relative liver size of juvenile fish between the sampling locations closer to the Mine and reference areas (where Mine activities are not likely to be able to result in an impact), which may be a sign of a toxicological response as defined under the Action Level assessment and triggered Action Level 2 in

2019. Factors contributing to similar effects in 2016 were determined to be inconsistent with a Mine effect, and were likely as a result of localized habitat variation among study areas in Lac de Gras. Fish tissue concentrations of molybdenum, silver, strontium and uranium in the sampling locations near the Mine (near-field areas) were significantly greater when compared to the sampling areas further from the Mine (far-field areas), and exceeded normal levels in samples collected from areas closer to the Mine; however, concentrations of these metals have remained relatively stable since 2013, with the exception of molybdenum which exhibited an increase of 34%.

- Small fish (slimy sculpin) sampled in 2016 were healthy, with few irregularities. Body condition and liver size were similar throughout the lake. All sizes of fish were captured in each area, which shows that reproduction is successfully occurring. Parasites (i.e., tapeworms) were common in each study area, but more prevalent in the fish caught closer to the mine. Average values of all measured fish health variables were within normal levels. Fish closer to the mine were 9% to 29% shorter and lighter than fish caught in areas further from the mine. Differences in habitat (i.e., water temperature, lake bottom sediments) or the difference in numbers of parasites between sampling areas in 2016 may account for, or contribute to, the difference in the size of fish between the areas closer to and further from the mine in 2016. Concentrations of some metals, such as molybdenum, strontium, and uranium, bismuth and tin, as well as calcium and phosphorous, were higher in areas closer to the mine and in the vicinity of A21 construction. These differences found in fish size may be a response to the chemicals present in fish flesh closer to the mine and as such, they triggered an Action Level response to investigate the cause and confirm the effect. Results of the fish health study seemed as though they could be the result of possible contamination; however, these were considered low-level and there was a lack of contamination in the small plants, animals and bugs, which would be expected to occur before effects are noticed in fish. The fish health responses for 2016 could represent normal changes that can occur within the lake, or they could be caused by other biological or physical factors.

- These small fish were sampled in 2013. Differences in the body size (length and weight) of the fish, as well as the condition factor (how 'fat' the fish is, or length in relation to weight), relative liver size, and relative gonad size were observed in fish caught near the mine compared to those in areas further from the mine. This demonstrates a potential toxicological response (a reaction to exposure). These observations are not consistent with the results of previous fish surveys in Lac de Gras or with the other findings of the AEMP that all indicated a nutrient enrichment response. Overall, the fish data indicate that an Action Level 1 (confirm the effect) has been reached, which means this study will be repeated in 2016.

- The small-bodied (slimy sculpin) fish survey was also done in 2010. Results showed that there was some change to size and condition of the fish that would be consistent with nutrient enrichment (more availability of food and nutrients); this was found closer to the mine. There were some metals in the fish tissue that could have a moderate effect on fish, but there did

not appear to be any impacts to fish health. Mercury levels in the fish tissue were lower than previously reported in 2007 and were within the expected range. A different lab was used to analyze the tissue samples, but the reason for the differences between the 2007 and 2010 studies is not known.

- An increased amount of mercury was detected in tissue from small fish (slimy sculpin) taken from the lake in 2007.

Lake Trout and Mercury

A large-bodied fish tissue sample program was done on Lake Trout between 29 July and 10 August 2014 in Lac de Gras and Lac du Sauvage (LDS). Samples were taken using a non-lethal technique, and fish were also aged and weight and length of each were recorded. Except for one fish from LDS, all sample results, were below the Health Canada guideline of 0.50 mg/kg. Based on the amount of mercury in fish in 2014, Lake Trout in LDG and LDS would not be expected to have health concerns or pose a risk to human health.

- A large-bodied (lake trout) fish survey was done in 2011 to test mercury levels in fish. The results from this study showed that mercury levels are increasing slightly in both Lac de Gras and Lac du Sauvage. The average mercury concentration in lake trout from Lac de Gras was similar to that found during 2008. This number is a length-adjusted number because mercury concentrations increase with size and age. The lake trout in Lac du Sauvage were found to have average mercury concentrations higher than those found during 2008; this lake is upstream from Diavik. A low-level effect was given for fish mercury levels, though it doesn't appear to be linked to the mine.
- A special study was conducted in 2009 as a joint research program with Fisheries and Oceans Canada (DFO) to assist in understanding if mercury in the slimy sculpin tissue (identified in 2007) is related to the treated mine water discharge. Results from this study did not support the idea that higher levels of mercury may be because of increased mercury being released from sediments due to nutrient enrichment from the treated mine effluent.
- In 2008, Diavik conducted a study to further evaluate the elevated mercury in fish tissue, this time studying large-bodied fish (lake trout). The fish liver tissue analyses indicated that there is no concern relating to the concentration of metals, including mercury, in lake trout, but that some very large/old fish did show higher levels of mercury than smaller fish, as can be expected. A mercury study was also completed on treated mine water discharge and determined that concentrations are below the best analytical detection limits available.

Global concern over mercury levels has increased due to human activity and industrial processes. Increased levels have been noted in the past in small fish in Lac de Gras (Diavik 2007), as well as in other lakes located throughout the Northwest Territories (http://www.hss.gov.nt.ca/health/environment-and-your-health/mercury-levels-fish).

Other

In 2014 and 2015, a study was also done to see if big fish like Lake Trout move between Lac de Gras and Lac du Sauvage, as it was unclear if LDS could be used as a reference lake for the mercury monitoring program. To do this, 126 Lake Trout (120 from LDG and 20 from LDS) were tagged with a transponder to track their movement. Over the course of one year, 29 fish (23%) travelled between the two lakes by using the Narrows. The majority of the fish that moved between lakes were originally tagged near the Narrows, but nine of the fish travelled greater distances of up to 20 km away. Of the 29 fish that moved between lakes, 4 were detected only once, and the remaining 25 were detected multiple times. One fish was tagged moving between the two lakes 128 times.

Fish habitat utilization studies showed that lake trout continue to use both natural and man-made shoals near the A154 dike.

A Blasting Effects Study was done starting in 2003 and showed no effects on fish eggs.

Since 2000, no fish have been taken by recreational fishing from Lac de Gras by Diavik.

Other observations made include:

Sediment deposition rates measured during the construction of the dikes were below levels predicted in the Environmental Assessment.

In 2002, 2526 fish were salvaged from inside the A154 dike pool and released in Lac de Gras. 526 fish were salvaged from the North Inlet and released to Lac de Gras.

In 2006, 725 fish were salvaged from inside the A418 dike pool and released in Lac de Gras.

In 2017, 309 fish were salvaged from inside the A21 dike pool and released in Lac de Gras. Of the 309 fish captured, 148 fish were transferred and released into Lac de Gras. In total, 16.7 kg of fish were sacrificed and frozen for distribution to local communities, with 30 kg of fish transferred live into Lac de Gras.

Runoff and Seepage

There are locations where intercepted water and runoff are monitored at the Diavik mine site. There were historically 22 stations that included: 7 survey stations, 5 groundwater monitoring stations and 10 collection ponds. In 2013, 4 groundwater and all 7 survey stations were discontinued. Working with the WLWB, Diavik's program was changed in 2013, 2018 and 2019 to include the following monitoring stations, as identified in Figure 4:

- 2 freshet surface runoff stations;
- 1 groundwater well;
- 1 sump;
- 4 interception wells (within the PKC dams);
- 10 collection ponds; and
- 7 A-Portal misclassified waste rock potential seepage monitoring locations.

Runoff is monitored and managed by DDMI staff and the Inspector is kept informed of any seepage issues, as well as the short and long term plans for monitoring and repairs. No seepage has been seen downstream or outside of runoff collection areas since 2013, as the upstream interception systems successfully captured and diverted any runoff. Five (5) seepage samples were taken during 2012.

Water Quantity

What effect will the mine development have on water quantity?

EA Prediction and Overall Status:

- ***Water supply to the mine is not limited and use of the resource will not cause changes in water levels and discharges from Lac de Gras beyond the range of natural variability.***

Monitoring and modelling results have not shown a significant change in water levels or discharges from Lac de Gras.

Observations:

The figure below shows the purpose and amounts of fresh water used from 2000 to 2019 (Figure 10). Diavik recycles water from the PKC and North Inlet as much as possible in order to reduce the amount of fresh water needed; in 2019, this amounted to 2.8 million m^3 of recycled water which is about the same as last year (2.9 million m^3). The Water License allows Diavik to use a total of 1.28 million m^3 of Lac de Gras water per year; Diavik has always remained well below this amount and only used 677,381 m^3 in 2019. Use of water from Lac de Gras by Diavik is not causing changes in water levels beyond natural variability. Further information can be obtained from the Water Management Plan.

Figure 10 Freshwater use volumes from 2000-2019.

Climate and Air Quality

Will the mine development affect air quality around Lac de Gras?

EA Predictions and Overall Status:

- ***Ambient air quality objectives will not be exceeded; and***

Dustfall levels were higher than originally predicted during open pit mining but have remained below BC Objectives (used for comparison) and TSP levels have generally remained below NWT Guidelines.

- **The mine will be a very minor greenhouse gas emission contributor to Canada's total emissions.**

Emissions are tracked and reported; levels remain relatively stable across years.

Observations:

As predicted, dust deposition decreases as one moves away from the mine. The rate of dust being deposited is affected by activities at the mine (for example, higher dust deposition is typically measured at the airport compared to the west part of East Island where there is very little activity) as well as by wind direction (because wind carries the dust). These trends have been measured each year since dust monitoring began in 2001. Dust suppressants were investigated for use on the airstrip, but the small runway size and nearness to the lake have prevented the safe use of such chemicals. Suppressants are used on the helipad, taxiway, parking lot and apron areas.

Total Suspended Particulates (TSP)

During 2012, a revised air quality modeling and monitoring approach was used to update the prediction of deposition rates from the EA. An Air Quality Monitoring Program was finalized and implemented as part of this process and included two TSP monitoring stations; one located by the Communications building and the other on the A154 dike (Figure 11). In 2019, DDMI determined that continued TSP monitoring is not a valuable component of the air quality monitoring initiatives at the Diavik mine. Results have not proven useful in developing adaptive management strategies for improving air quality at the site. In addition, equipment reliability issues have required significant on-site and off-site maintenance programs that have impeded their availability and caused strain on Environment department resources. For the reasons noted above, DDMI has elected to discontinue TSP monitoring. DDMI would like to emphasize that it will still be continuing all remaining components of the EAQMMP that track items of community concern while continuing to provide valuable data that is utilized in the adaptive management of air quality on site; the EAQMMP Version 2 reflects these commitments. In addition, DDMI's ongoing Aquatic Effects Monitoring Program (AEMP) enables the monitoring and assessment of the effects of accumulation of project-related dust and air emissions on aquatic receptors.

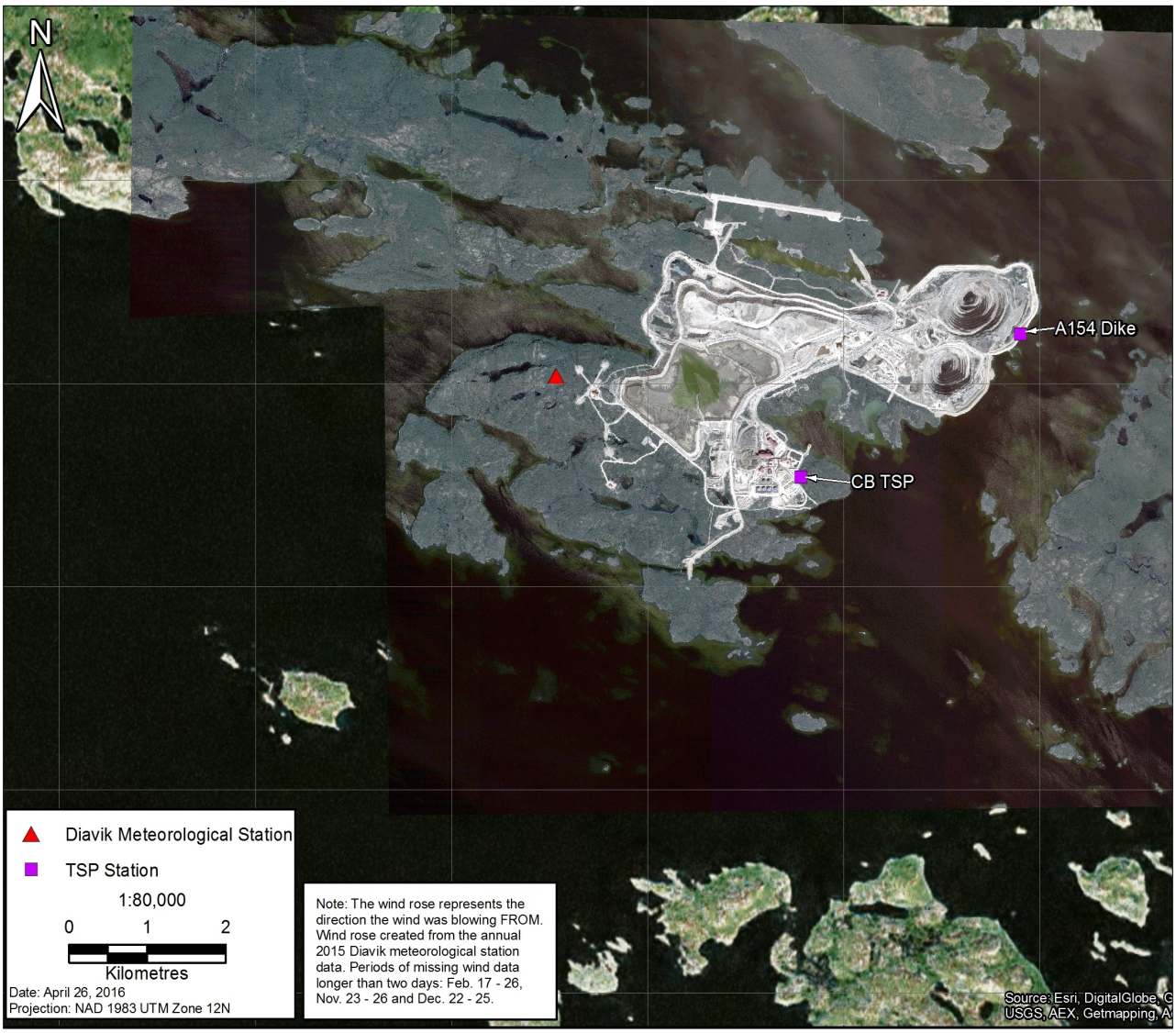


Figure 11 TSP monitoring station locations.

From January to December 2018, TSP was measured at the Communications Building (CB) station. The TSP monitoring at A154 Dike station was suspended in 2018 due to issues with the equipment. There was no exceedance of the Government of the Northwest Territories (GNWT) 24-hour average TSP guideline (120 µg/m^3) at the CB station (see Figure 12). The maximum daily average value was 23.2 µg/m^3, and the minimum value was 0.3 µg/m^3. The 2018 annual average TSP concentration at the CB station was 3.6 µg/m^3 and was well below the annual GNWT standard (60 µg/m^3). TSP monitoring at the CB station had valid daily data for 86% of the days in 2018 (314 valid daily data out of 365).

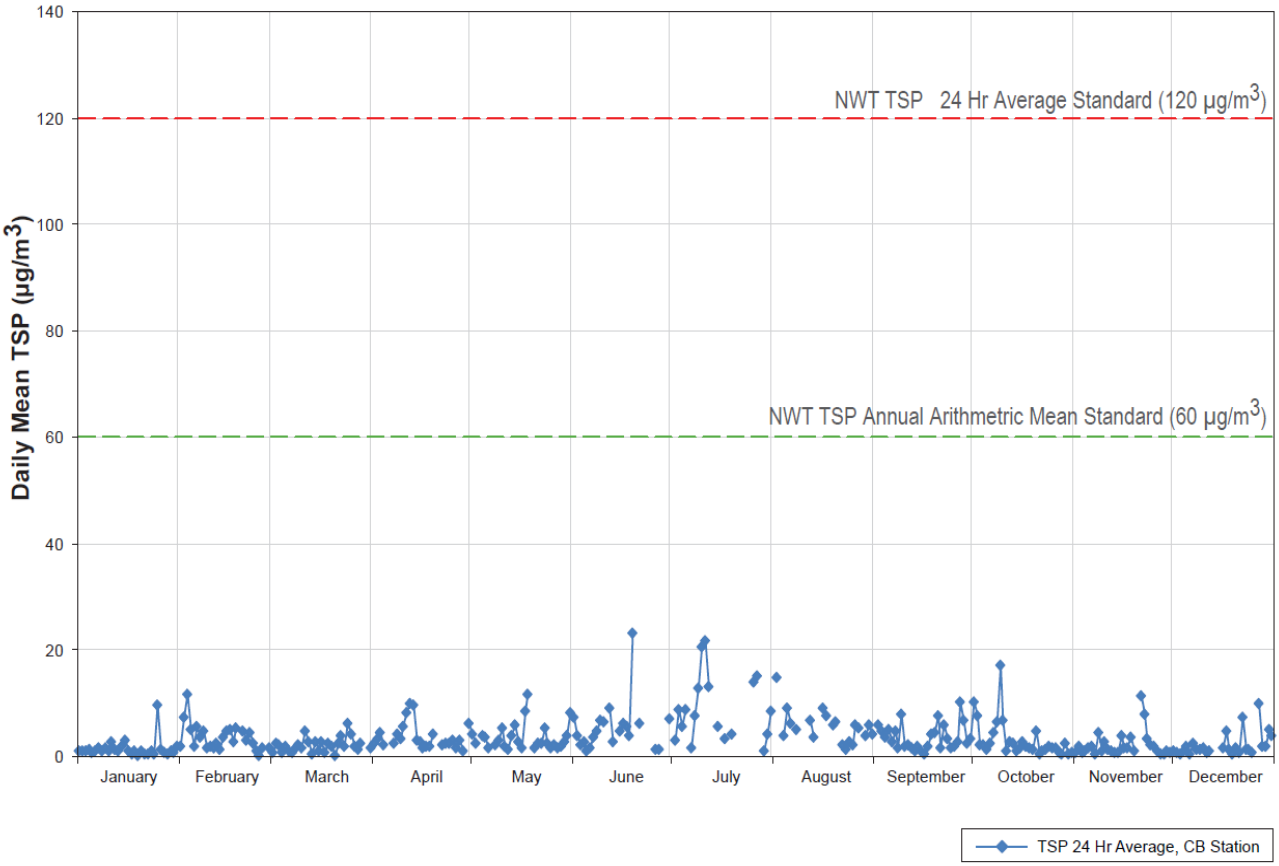


Figure 12 2018 Communication Building daily average TSP amounts.

- From January to October 2017, TSP stations had valid daily data for 71% and 69% of days at the communications building and A154 Dike stations, respectively. TSP levels at the communications building remained below the GNWT Department of Environment and Natural Resources (ENR) 24-hr standard of 120 micrograms per cubic meter (µg/m^3), and 4 samples were above the 60 µg/m^3 annual standard (Figure 13). From January to October 2017, samples from the A154 station showed one sample above the 24-hr standard and 4 above the annual standard (Figure 14). Elevated TSP concentrations were measured by both stations from August 13 to 15 as forest fire smoke was observed at the Mine site on these dates. The 2017 results agree with Diavik's prediction that there would be up to two (2) exceedances of the 24-hr standard per year.
- There was one high reading (120 µg/m^3) above the 24-hr standard during 2016, though the TSP monitoring station on the A154 dike was not working for 10 months of that year. During 2014 and 2015, TSP readings did not exceed the GNWT -ENR standard of 60 µg/m^3, and there was only one daily exceedance of the 24-hour standard at the Communications building. The 2016 results agree with Diavik's prediction that there would be up to two (2) 24-hour exceedances per year.

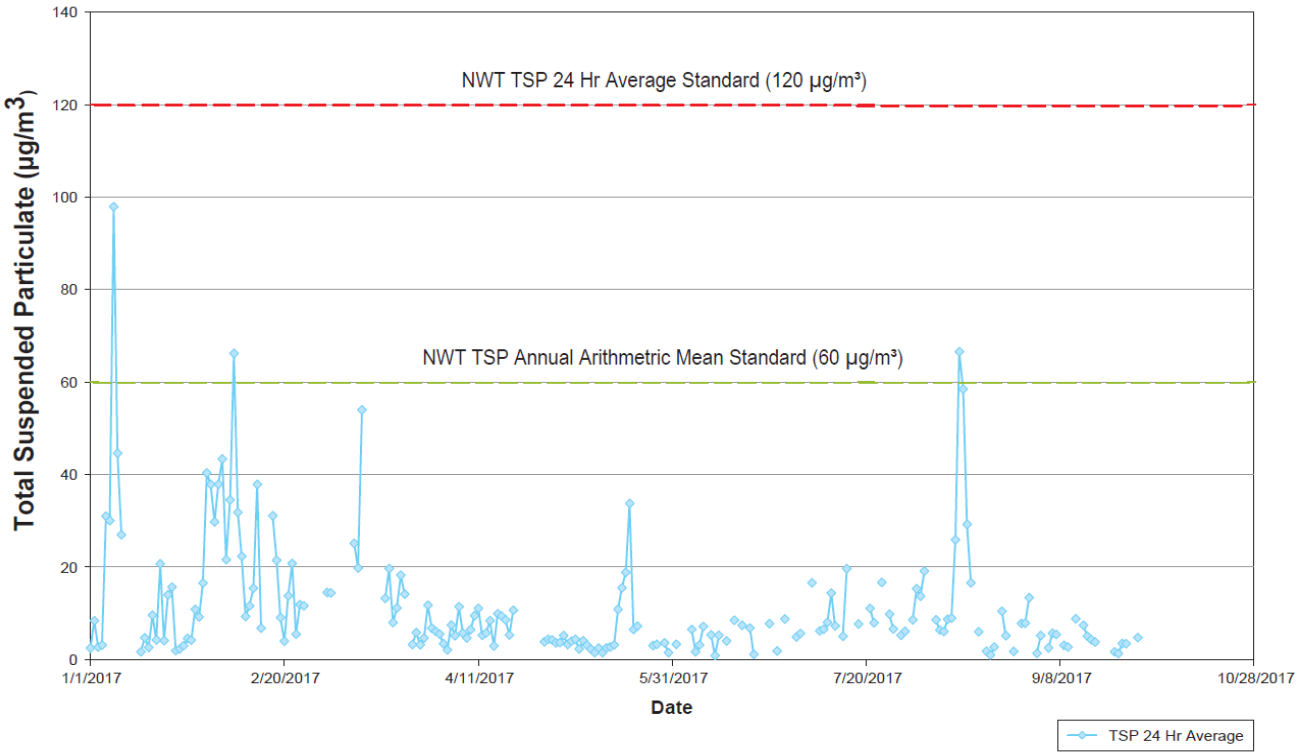


Figure 13 2017 Communication Building annual 24-hr TSP amounts.

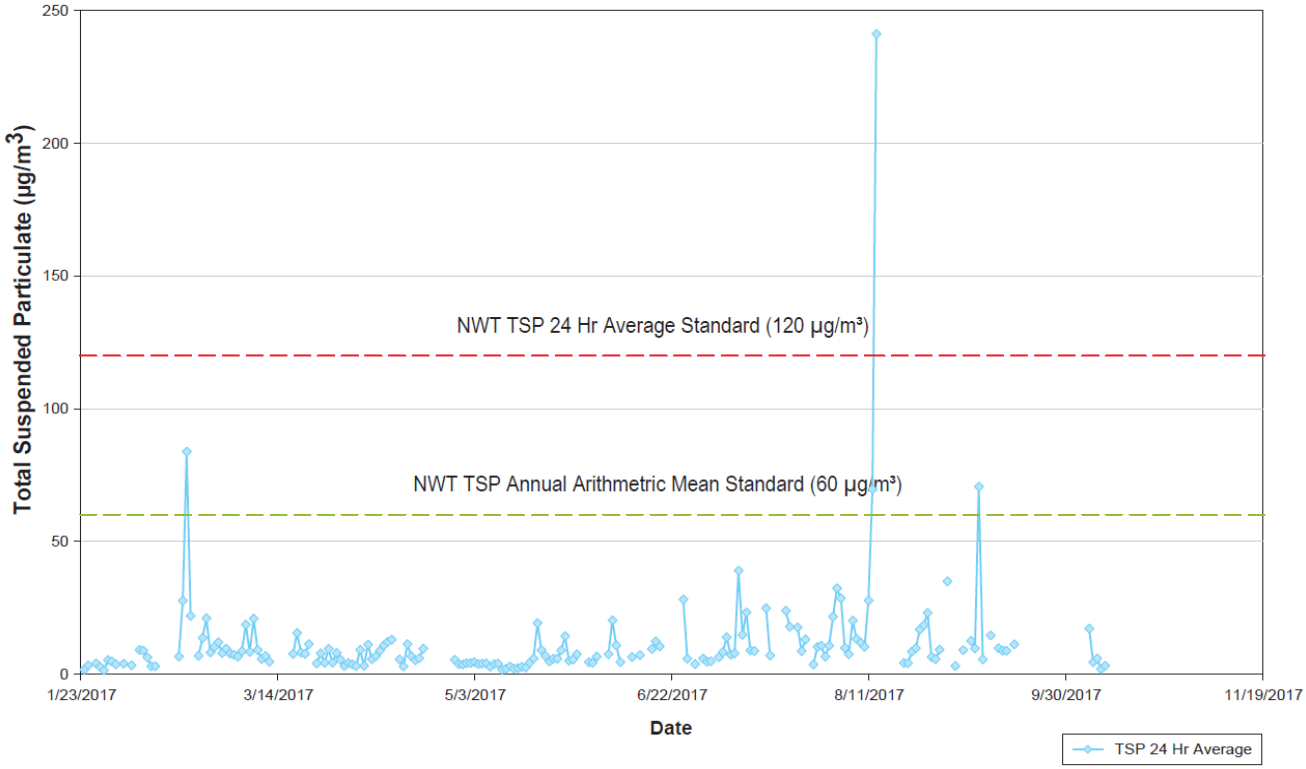


Figure 14 2017 A154 Dike annual 24-hr TSP amounts.

- Even with the monitoring stations being located on the mine site, all TSP values measured during 2013 were below the GNWT Ambient Air Quality Guideline, save for one day in December 2013 that was thought to be due to snow clogging the sensor, and the results agreed with DDMI's updated dispersion model predictions completed in 2012.

Dust Gauges

The dustfall rates estimated from dustfall gauges in 2019 were comparable to the 2018 rates, which were the highest recorded since 2008. The higher recorded dustfall values in both 2018 and 2019 suggest that dustfall rates in these two years were likely influenced by the surface activity at the Mine, particularly at the A21 open pit. The 2019 annualized dustfall rates estimated from gauges at all stations were below the upper limit of the Alberta Ambient Air Quality Objectives and Guideline for dustfall (1,924 mg/dm2/y), which is applied to commercial and industrial areas. There are no dustfall standards or objectives for the Northwest Territories.

- In 2018, dustfall values remained lower than the former British Columbia dustfall objective for the mining industry (BC MOE 2016) except at the four sites that recorded the highest dustfall rates in 2018 (i.e., Dust 3, 7, 10, and 1). Dust deposition rates in 2018 were the highest since 2008 at some locations. The higher dustfall rates were likely due to the surface activity at the Mine, particularly the A21 open pit, which began active mining in December 2017. Deposition rates were highest close to the Mine and decreased with distance from the Mine.
- Comparisons of mean and maximum dustfall values suggest that dustfall rates during 2017 remained within the range of dustfall rates typically recorded at the Mine site, and were lower

than the British Columbia dustfall objective for the mining industry. A21 dike construction activities likely contributed to the amount of dust during 2016 and 2017.

- Dust fall levels continued to show a decreasing trend in 2014 and 2015, based on distance from the mine. The lowest dust fall level was recorded at one of the control sites located 5.5 km away from the mine. Values recorded for each of the 12 dust gauges and 27 snow survey stations were below the BC objective range of 621 to 1,059 mg/dm^2/y.
- In 2013, dust fall levels were lower than in previous years, with the exception of the area close to the airstrip (common with gravel runways) and an area downwind of the prevailing winds. Dustfall values for most stations remained below the BC dustfall objectives for the mining industry. The two stations that exceeded the BC objective were located beside the airstrip.
- In 2012 there was a decrease in dust levels at 7 of the 12 dust gauges as construction slowed down and Diavik transitioned from an aboveground to underground mine. Dust levels were still higher than predicted, most notably 250 meters (750 feet) from the airstrip. Dust levels were also higher near the PKC area, due to construction activities.

Overall, dust deposition rates have been more than what was originally predicted by models in the Environmental Effects Report, because that model did not account for additional construction and operational activities relating to underground mine development. However, all except one of the average dust deposition levels remained below the BC Objectives for mining.

Snow Water Chemistry

For comparative purposes, the snow water chemistry results were screened against effluent quality criteria in the Water License (the limits for treated mine water being released back to the lake); however, there is no regulatory requirement for snow water chemistry to meet these criteria.

In general, analyte concentrations in snow meltwater decreased with distance from the Mine site. Concentrations in 2019 were lower than measured during recent years for all parameters except ammonia, nitrite, and phosphorus. The highest concentrations of all variables were less than their corresponding EQC.

- Concentrations of snow water chemistry variables were below effluent quality criteria in 2018. This was also true for 2017, with the exception of 4 variables (i.e., aluminum, chromium, nickel and zinc), that were higher than these numbers at a single station (Station SS3-4, 200-1000 m away from the mine, and east of A21 construction).
- Measurements of the amount of chemicals in the water from melted snow indicate that the concentrations measured in 2016 and 2014 were also below the levels outlined in the Water License. In 2015, results were below water license levels for all snow cores except SS3-6 where elevated levels of aluminum, chromium, nickel and zinc were found. However, this sample was accidently taken closer to the mine site than it should have been so the ability to compare the results is limited.

Greenhouse Gas Emissions

Total greenhouse gas emissions for Diavik in 2019 was 192,103 tonnes of CO_2e. In 2018 it was 219,010 tonnes, in 2017 it was 194,968 tonnes and 2016 was 191,632 tonnes of CO_2e, all of which were an increase from 2015 due to A21 dike construction. "CO2 e" is an abbreviation of 'carbon dioxide (CO_2) equivalent'. CO_2 is a greenhouse gas, but there are many more greenhouse gases. To make it easier to understand greenhouse gases, a standardized method is to report all of the greenhouse gases from a site together as if they were equal to a set volume of CO_2; this is the CO2e referred to above. The wind turbines were able to offset approximately 4.1 million liters of diesel fuel use in 2019, down from a 4.2 million liter reduction in 2018.

Vegetation and Terrain

How much vegetation/land cover will be directly affected by the mine development?

EA Predictions and Overall Status:

- ***Approximately 12.67 km² of vegetation/land cover will be lost at full development; and***

Total vegetation/cover loss to date remains below the amount predicted

- ***Slow recovery of vegetation following mine closure.***

Recovery of vegetation after mine closure cannot yet be determined.

How will the vegetation communities outside the mine footprint be changed as a result of mine development?

- ***Localized changes in plant community composition adjacent to mine footprint due to dust deposition and changes in drainage conditions.***

Limited and local effects on plant types have been seen between areas closer to and further from the mine

Observations:

There was minimal direct vegetation/habitat loss in 2019 due to mine development. Total habitat loss to date from mining activities is 11.19 km². This is within the predicted amount of 12.67 km². The table below shows a running total of the habitat loss to date.

Portions of terrestrial habitat within the Mine footprint have remained as physically undisturbed residual areas since construction and through the end of 2019. As such, these residual undisturbed areas were removed from the total Mine footprint in 2019.

Table 7: Cumulative habitat loss each year.

Predicted Vegetation Habitat Loss (km²)	**Up to 2001**	**2002 to 2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018 to 2019***
12.67	3.12	8.15	8.86	9.40	9.66	9.78	9.65	9.71	10.1	10.12	10.15	10.55	11.22	11.31	11.19

* Net gain of habitat from removal of undisturbed areas from total Mine footprint in 2019.

Vegetation Plots

Permanent vegetation plots (PVPs) were established close to and far from the mine site in 2001 to monitor if there are differences in vegetation and ground cover near the mine and farther away from the mine. The program is conducted every 3 years and in 2004, the program expanded to include 15 mine plots and 15 reference plots (far from the mine). In each of these areas, 5 sample plots for each

of 3 vegetation types (heath tundra, tussock-hummock and shrub) were set up so as to reduce within site variability of plant communities (which was high) and increase the likelihood of capturing true change in plant abundance between mine and reference areas over time.

- PVPs were sampled in 2016. The results of the analysis of dust deposition and vegetation data show differences in the amount and types of plant species in mine and reference plots (natural tundra at a far distance from the mine) over time that are likely due to Mine-related effects, such as dust deposition. Natural changes in conditions among PVPs prior to and after mining, annual differences in weather, plants being eaten by wildlife/caribou, personnel variability and difficulty in identifying uncommon species have also probably influenced results for plant species. However, the differences between mine and reference sites have remained largely the same over the past 10 years, with limited and small effects. Importantly, the data show no potential towards a disagreement in the observed patterns of the amount and types of plant species. Based on the principles of adaptive management and the slow response of vegetation in the Arctic, it is recommended that this program be continued to confirm if the observed differences and changes in plants continue during mining operations; however, the sampling frequency was reduced to once every 5 years

- The PVP's survey done in 2013 had results that showed that dust on vegetation may be changing the amount (abundance) and types (composition) of some plant species in vegetation types near the mine. Lichen cover on heath tundra and shrub mine plots continues to decrease over time, while the average numbers of vascular plants (e.g. grasses, small plants) in these same areas are increasing. This has also been observed in other studies looking at the effects of road dust on different types of plants.

- Observations of PVPs done in 2010 showed that there were more grasses and flowering plants closer to the mine versus further from the mine, and there was also lower soil lichen cover and higher litter cover values closer to versus further from the mine. During the previous sampling year, there was no ecologically significant difference in vegetation and ground cover between mine and reference plots for each of the plant communities assessed.

Lichen

Lichen studies are conducted every three to five years to determine the amount of metals in lichen from dust deposition closer to and further away from the mine with the next study scheduled for 2021.

- In the 2016 study, sample areas for lichen near the mine were in the same areas as the dust collectors, while the sample sites further away from the mine were previously chosen by TK holders at a distance approximately 40 km (24 miles) away. In 2016, a far-far-field sampling area was used to collect lichen at three stations approximately 100 kilometres from the Mine site.

- Metals concentrations in lichen were compared between areas close to and far from the mine, and among the 2010, 2013 and 2016 sampling events. The amount of metals in lichen confirmed the observations of Elders that dust deposition was higher near the Mine when compared to areas further away. However, most metals in lichens from the areas near the mine in 2016 were also a lot lower than those found in 2010 and/or 2013. This decrease may be due to the change in mining operations from open pit to underground mining since 2012, resulting in an overall reduction in dust levels. Also, most metals levels in lichen from the far-far-field sampling area (100 km away) were similar to levels in the far-field sampling area (40 km away).

- The lichen monitoring program was also designed to determine whether the increased metals levels in lichen near the mine pose a risk to caribou health. A risk assessment was done in 2010 and showed no effects of concern to caribou health. Since the majority of metals levels have decreased below those reported in the 2010 risk assessment, a follow up risk assessment based on 2016 data is not required. Metal levels in lichen are predicted to remain within safe levels for caribou. Based on the principles of adaptive management, the sampling frequency for this study was reduced to once every 5 years to coincide with the change in the vegetation monitoring program.

- The 2013 sampling program had a scientific component focusing on metal levels in lichen and soil, as well as a TK component focused on assessing the type of landscapes caribou prefer for forage, use and migration, and to assess lichen conditions at various sample sites to see how dust from the mine potentially affect caribou use of the area. During the program, Elders noticed dust on lichen in near-mine areas, but did not see dust on lichen in areas further from the mine. The analysis of metal concentrations in lichen confirmed the Elder's observations, as the amount of most metals in lichen samples near the mine were significantly higher than those further from the mine. The Elders suggested that caribou would avoid near-mine sites because of poor food quality. It should be noted that the amount of metals found in lichen during the 2013 sampling program was lower than those found in 2010; this means that a follow-up risk assessment is not necessary as the level of exposure to metals remains at a safe level for caribou. Similar to the PVP program, lichen is sampled every 3 years, with 2016 being the next year this program is scheduled.

- The 2010 lichen study also looked at the metals data to find out how much dust caribou are exposed to (could eat) by eating the lichen with dust on it. With the exception of 4 metals, concentrations of all other parameters were higher close to the mine, as was expected. Aluminum levels were slightly high but the assumptions made for the risk assessment were very conservative (meaning that it was assumed that caribou feed in the area of the mine 100% of the time). Based on the risk assessment performed, the level of exposure to metals was within safe levels for caribou.

Re-vegetation

Research conducted to date has indicated that soils can be constructed from many different materials salvaged from mine operations (e.g. gravel, till from the bottom of the lake, treated sewage sludge) and used effectively for re-vegetation. Seed loss (erosion) may be an issue and use of erosion control techniques, such as erosion control blankets (straw mats) and the addition of some protective mounds, bumps and rocks on the ground, are showing some success for increasing plant growth. Lastly, the regrowth process at reclamation sites is faster than for natural recovery but it still takes a long time, with soil and plant development taking 2 to 3 years. A final report summarizing the results of the re-vegetation research done for Diavik has been completed and relevant information will be incorporated into the Closure and Reclamation Plan V4.1

Wildlife

Caribou

Will the distribution or abundance of caribou be affected by the mine development?

EA Predictions and Overall Status:

- ***At full development, direct summer habitat loss from the project is predicted to be 2.97 habitat units (HUs). (A habitat unit is the product of surface area and suitability of the habitat in that area to supply food for caribou and cover for predators);***

Direct summer habitat loss from the project has remained below the value predicted.

- ***The zone of influence (ZOI) from project-related activities would be within 3 to 7 km;***

The most recent estimate of the ZOI has been calculated as 14 km.

- ***During the northern (spring) migration, caribou would be deflected west of East Island and during the southern migration (fall), caribou would move around the east side of Lac de Gras; and***

Northern migration generally occurs west of the mine; southern migration occurs east and west of the mine.

- ***Project-related mortality is expected to be low.***

Mine-related caribou deaths have remained low.

Observations:

In 2019, caribou numbers on the East Island reported by staff ranged from 2 to approximately 2,000 animals. There were also three instances where groups of 150 caribou or more were observed near the Mine site and up to 28km away. In addition, a herd of approximately 2,000 caribou were observed on 22 February at an unrecorded location. In total there were 79 different incidental observations reported with all observations except one occurring before 1 June. Various methods are used to determine whether or not animals were present in the vicinity of the Mine, which included incidental observations reported from pilots and workers, and using the satellite collar locations provided by ENR.

Habitat

There was no loss of direct summer habitat in 2019 due to mine footprint expansion. The total amount of Habitat Units (Hus) lost to date is 2.75 HUs (see table below). This is less than the amount that was predicted (2.965 Hus).

Table 8: Caribou habitat loss (HUs) by year.

Prediction	2000-2005	2006	2007	2008	2009	2010	2011	2012	2013-2014	2015	2016	2017	2018	2019*	Loss to Date
2.97	1.96	0.15	0.18	0.13	0.04	0.00	0.02	0.13	0.00	0.13	0.06	0.00	0.08	-0.15	2.75

* Net gain of habitat from removal of undisturbed areas from total Mine footprint in 2019.

Caribou summer habitat loss was greatest in 2001, when the majority of haul roads and laydown areas for mine infrastructure were constructed. The loss of habitat in 2008 was associated with expansion of mine infrastructure to support underground mine development, and that for 2012 related to development of the wind turbine pads.

Reevaluating a Zone of Influence

An external, independent review of the Diavik and EKATI survey data was done by Boulanger et al. and the results indicated that the estimated Zone of Influence (ZOI - the size of area where caribou avoid the mine) on the probability of caribou occurrence around the mines was approximately 14 km. However, 2019, reanalysis of the same aerial survey data (1999-2012) determined a measurable ZOI was not detected or supported by the data (2019 Wildlife Management Report).

The spatial (space occupied by caribou) patterns showed that the availability of area and preferred habitat increases with distance from the mines. In the absence of sensory disturbance effects, caribou abundance (number of animals) and distribution should also increase with distance from mines. Results of 13 years of caribou monitoring with greater than 128,000 observations indicated that caribou in the Lac de Gras region are distributed in accordance to the spatial distribution of preferred habitat in undisturbed areas adjacent to the two diamond mines (Figure 15).

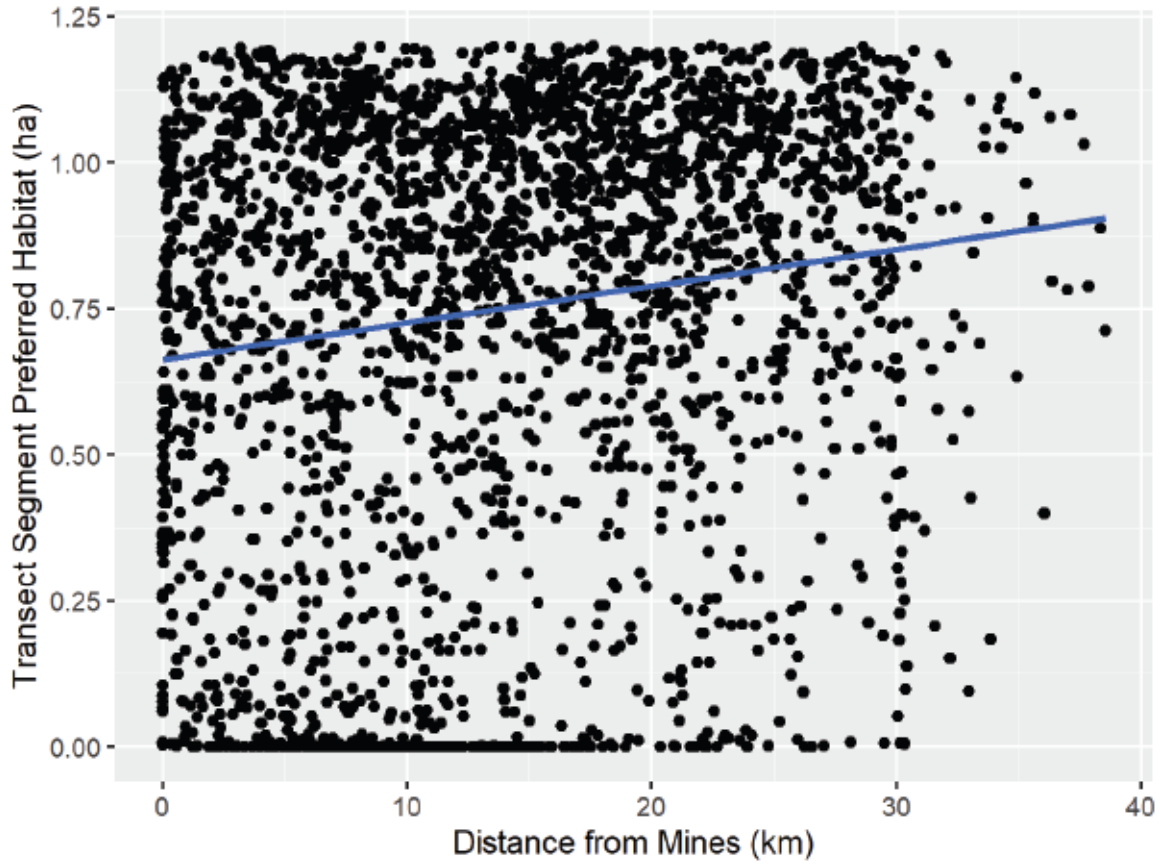


Figure 15 Spatial distributions of preferred caribou habitat area (ha) of aerial survey transect segments, 1998 to 2009, and 2012.

While previous analysis applied a presence-absence (of caribou) approach, it is believed that the conclusion of the presence of a ZOI was due to misinterpretation of statistical support for a positively correlated distance variable that was specified as an additive model effect.

The study demonstrated that an understanding of the distribution of habitat quality relative to sources of sensory disturbance is important for assessing the pattern of animal use in the study area. A graphical representation of habitat quality distribution is an informative first step for understanding how caribou or other animals should be distributed in the absence of sensory disturbance. Sensory disturbance is expected to reduce habitat use (through avoidance) relative to proximity (nearness) to human development. Thus, use of preferred habitat by caribou should change with proximity to human activity and the magnitude and spatial extent of the change is expected to be measured through statistical support of an interaction between distance and preferred habitat, which was not the case for these data.

Aerial Surveys

Due to low caribou numbers and community concern, aerial surveys have been suspended since 2009 (with the exception of 8 July to 13 October 2012). Aerial surveys continue to be suspended in favour of

other studies that support the GNWT Barrenground Caribou Management Strategy and Bathurst Caribou Range Plan.

Movements

The caribou movement 2018 analysis showed that caribou move more slowly when they are in good quality habitat. It found that more than half of the caribou paths were at least 100 km (61 mi) away from the mine and 24 km (15 mi) from the nearest lake. The relationship between difficult terrain and the distance caribou travel supported TK observations that caribou use flatter terrain and prefer to travel along shorelines. Despite there being a low number of movement paths near lakes in this study, caribou would move more slowly and stay in an area longer when they were near a lake. The analysis also showed that caribou move more quickly as they approach and spend time near the Diavik-Ekati mine complex. Lastly, long term scientific monitoring and TK have shown that caribou were usually present around the mine area in July and August. From 2009 to 2013, caribou remained closer to Contwoyto Lake and approached the areas of the mine during the fall rut period.

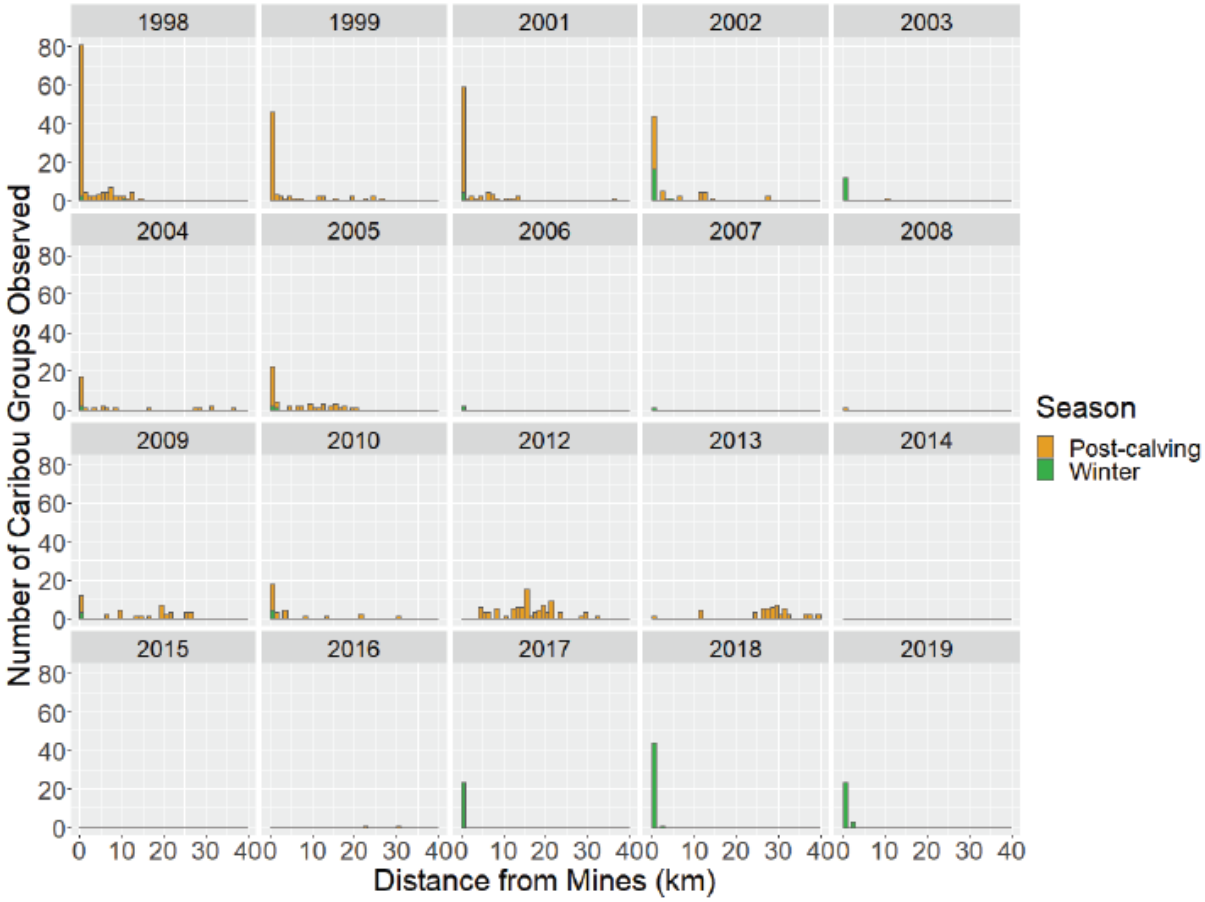
Ground-based Behavioural Observations

The goal of the ground behavior observation program is to generate enough observations to test possible impacts to caribou based on how they behave closer to and further from the mines. Monitoring is conducted cooperatively with the Ekati mine to collect and share data that covers distances from less than 2 km to greater than 30 km from mine infrastructure. Ground based-caribou observations are conducted by DDMI Environment staff on caribou groups that are sighted incidentally by mine site personnel and also on any caribou groups that are known to Environment staff to be on the Mine site. As well, caribou ground based behavior observations are conducted by DDMI Environment staff while conducting far field monitoring activities if there is presence of caribou. In past years, Diavik has had community Elders and youth participate in this work and contribute their input and knowledge to the program results.

From 11 January to 18 April 2019, behaviour scans were completed on 33 caribou groups from 0 to 15 km from the Mine and an additional three groups greater than 15 km from the Mine. Caribou collar locations received from the GNWT suggest these animals were most likely from the Beverly / Ahiak and Bathurst herds. The total number of caribou observed during behaviour scans was 518, group size ranged from 2 to 30 with the average group size of 9 animals. The majority of caribou were feeding (40%), followed by; walking (40%), standing (8%), alert (3%), trotting (3%) and running (<1%). Fewer caribou groups were observed in 2019 than in recent previous years as such there remain insufficient numbers of groups to detect a 15% change in behaviour. To detect a change in behaviour 55 unique groups in two distance groups (i.e., total of 100 caribou groups) are required.

The limiting factor for determining this change in behavior was the small number of far- field observations (3 observations). Due to changes in the herd size and migration patterns / timing over the past decade, caribou are generally in the study area during the winter when far-field observations are not practical or safe (related to cold temperatures) but on-site observations are safe and practical on account of continuous access to shelter(vehicles).

Caribou far-field and near-field observations from 1998 through 2019 are presented in Figure 16 below.



Note: does not include Ekati scan data since 2010 (n = 10 groups).

Figure 16 Frequency of caribou behaviour groups scans by distance from Mines from 1998 through 2019.

- Few caribou were observed in the study area in 2017, the number of behavioural observations/scans conducted was a total of 32 (0 to 2.7 km from the mine). Caribou collars locations suggest these animals were most likely from the Beverly/Ahiak and Bathurst herds. The total number of caribou observed increased compared to previous years and was 513, with a group size range from 1 to 64 and an average group size of 16 animals.
- The following numbers of behavioural scans were conducted in past years: 2 in 2016 (both more than 20 km away from the mine), 38 in 2015, 9 in 2014, 90 in 2013, 86 in 2012, 104 in 2011, 83 in 2010 and 89 in 2009. A full analysis of caribou behaviour data was done in 2011.
- During the early years of this monitoring, Diavik had limited opportunities to study caribou behaviour on the ground through scanning observations; in 2003, 2004, 2005, 2006, 2007 and 2008, ground observations of caribou behaviour were successfully completed for 12, 14, 5, 8, 24 and 7 caribou groups, respectively.

Migration Patterns

Deflection (off course) movements of caribou due to mining activities was predicted in the EA. It was predicted that the spring migration caribou would deflect west of East Island and during the fall migration caribou would move around the east side of Lac de Gras. The results from 1996 to 2018 have shown that there are years where collared caribou do not follow predictions but over the long-term there are no strong deviations from deflection prediction and or an ecological consequence, such as fragmentation of the herd. Changes in rates of eastern movements by collared Bathurst caribou cows were not associated with autumn range distribution or activity level at the Mine. While natural factors did not strongly influence eastern movement rates, the result of no association with mining activity supports previous analyses and conclusions that the Mine is not having a strong influence on caribou migration patterns. Applying the principles of adaptive management, using collared caribou movements to assess the deflection prediction should no longer be monitored. The deflection analysis does not inform on mitigation effectiveness so results will not lead to changes in how the Diavik Mine operates.

- Data from GNWT satellite-collared caribou in 2018 show that during the northern migration six caribou (3 females, 3 males) traveled west and five (2 females, 3 males) traveled east of Lac de Gras, which supports the prediction in the EER (Figure 17a). These results are also consistent with the long-term patterns observed since 1996, and further support the observation that the northern migration route of Bathurst caribou relative to the west and east side of Lac de Gras is influenced by their location on the winter range. During the southern migration, 17 collared caribou (9 females, 8 males) traveled west and 1 female collared caribou traveled east of Lac de Gras from July to 30 November 2018 (Figure 17b). The results for 2018 are not consistent with the prediction of eastern movement around Lac de Gras during the southern migration in the EER. Collared caribou cow seasonal range overlap from year to year has been consistent over time, so caribou are still able to access previously used areas despite variation in movements around Lac de Gras. The data suggest that the presence of mining activity within and adjacent to Lac de Gras has had little influence on the large scale movement and distribution of caribou in the region and no measurable ecological effect such as fragmentation of the Bathurst caribou herd. Based on the principles of adaptive management there is little benefit from continuing the monitoring of caribou collar deflections.

- During the 2017 northern migration the majority of caribou (31 in total; 17 males, 14 females) travelled west of the mine, which supports the prediction in the EER. Only 6 animals were seen travelling to the east of Lac de Gras (3 males, 3 females). During the 2017 southern migration, 11 caribou went east of the lake (1 male, 10 females), which supports the prediction in the EER. Five caribou (3 males, 2 females) travelled west of the lake.
- The 2016 northern migration 28 collared caribou (16 females, 12 males) traveled west and none traveled east of Lac de Gras, which supports the prediction in the EER. These results support the long-term patterns observed since 1996, and further support the observation that caribou movement west or east of Lac de Gras during the northern migration is dependent on their

winter range location (Golder 2011). During the southern migration, nine collared caribou (3 females, 6 males) traveled west and one female traveled east of Lac de Gras from July to 30 November 2016. The results for 2016 are inconsistent with the EER prediction of animals moving east around Lac de Gras during the southern migration. However, the comprehensive analysis conducted this year (Golder 2017) found that 120 (63%) of the 190 collared caribou moved east past Lac de Gras during past southern migrations from 1996 to 2016. Additionally, the comprehensive analysis found that 169 (73%) of the 231 collared caribou moved west past Lac de Gras during the northern migration. Long-term data best show that caribou movement paths generally correspond to the predictions made in the EER (DDMI 1998).

- Data from satellite-collared animals record cows in the Bathurst herd west of the mine site during the northern migration in 2015. Collar maps for the 2015 southern migration suggest that cows remained further north longer than usual (into November) and then the majority travelled east of Diavik during the southern migration as well. Two (2) collared cows were recorded moving west of Lac de Gras, as originally predicted. Analysis has shown that northern caribou movement patterns agreed with the EER prediction that the majority of collared caribou would travel west of the mine during the northern migration (78% of collared caribou). A total of 45% of collared caribou have travelled through the southeast corner of the study area over time during the southern migration. A TK study conducted through the Tłı̨chǫ Training Institute in 2013 developed a map (Figure 18) based on Elder observations that shows how caribou migrations have changed due to an increase in mining activity in the Slave Geologic Province. TK observations at that time suggested that caribou continue to move west and east of Lac de Gras during their migrations, while noting that they travel further from the mine and ultimately return to the same general areas for calving and overwintering.

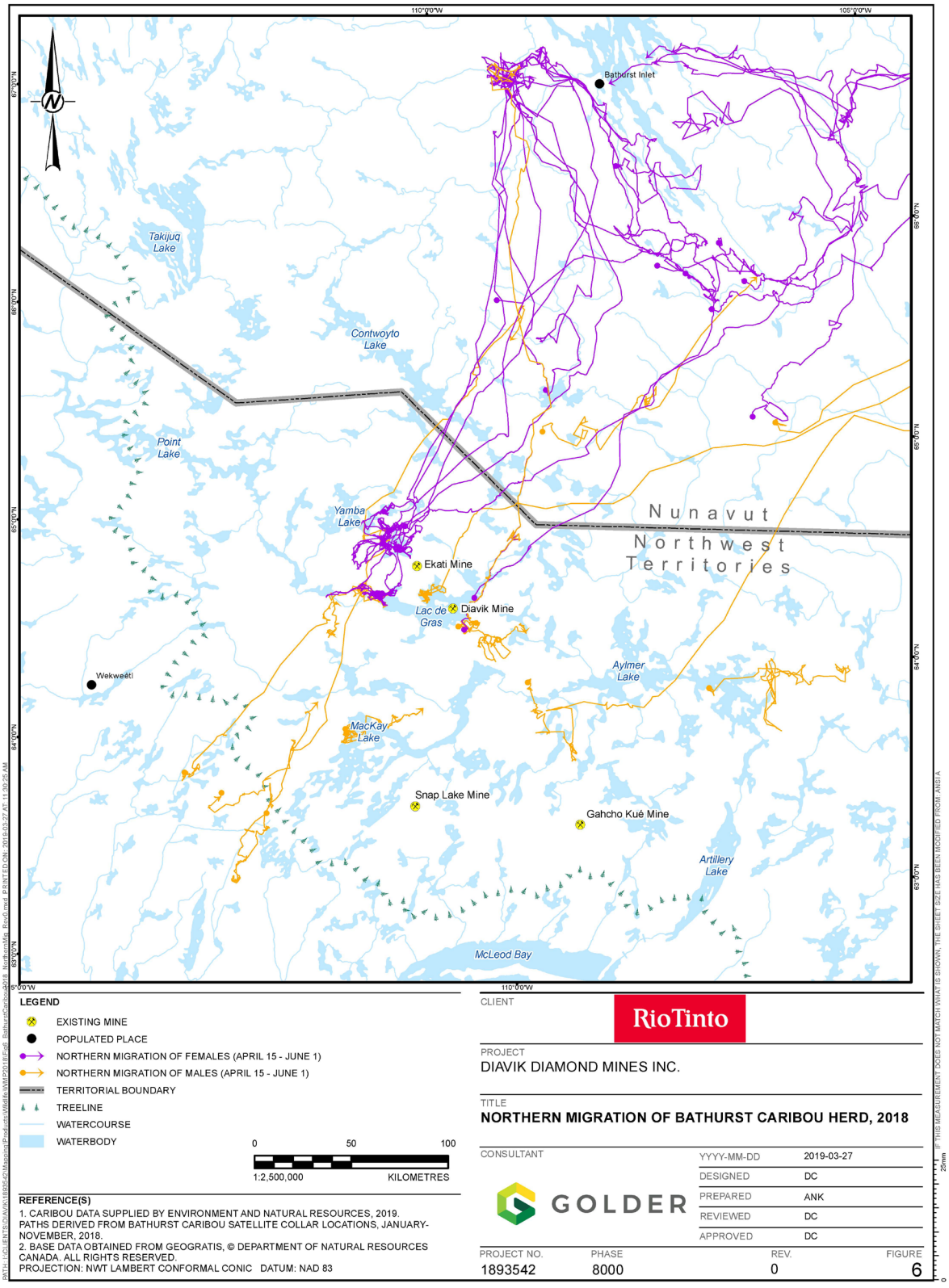


Figure 17a 2018 northern migration of caribou.

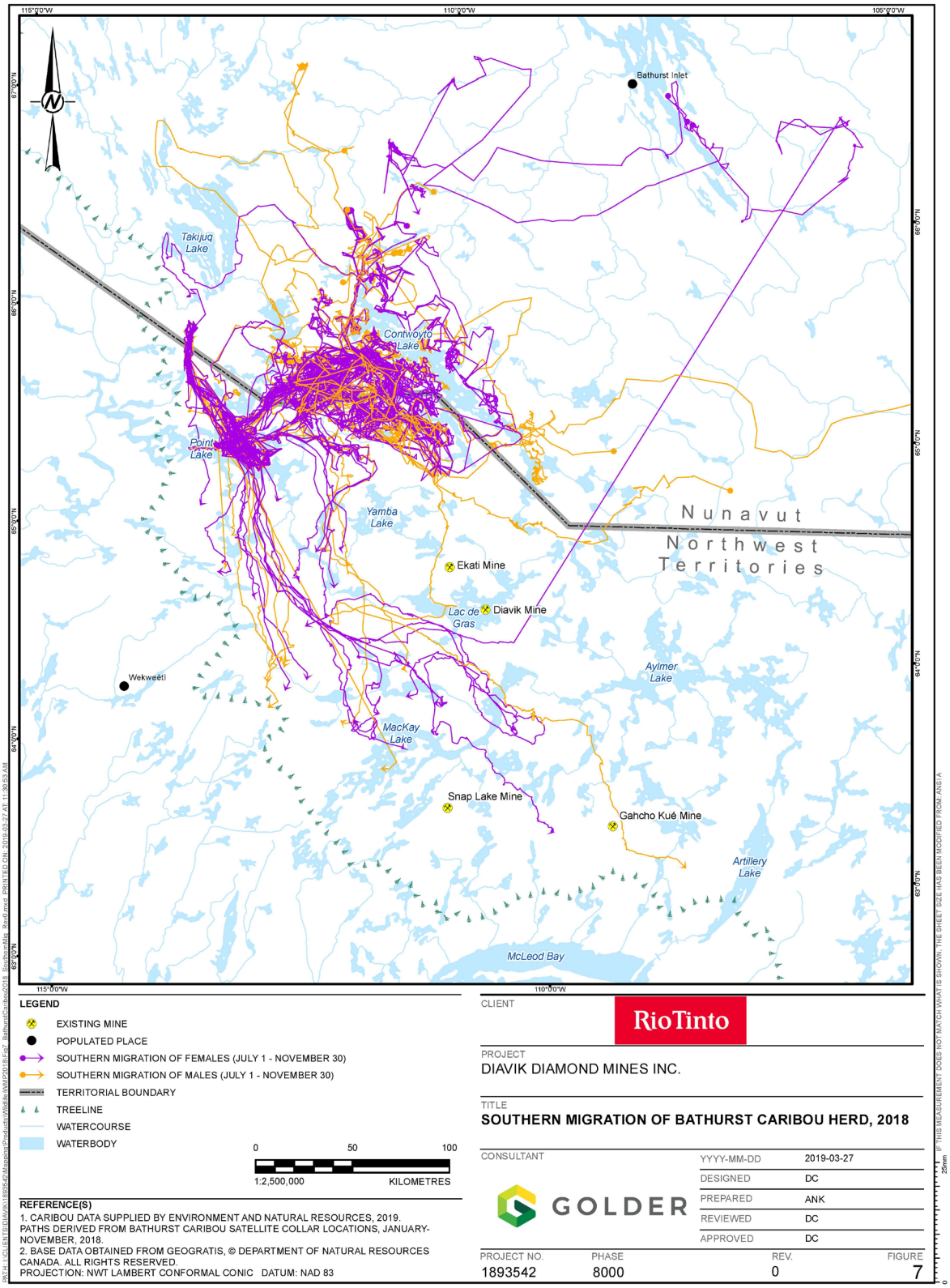
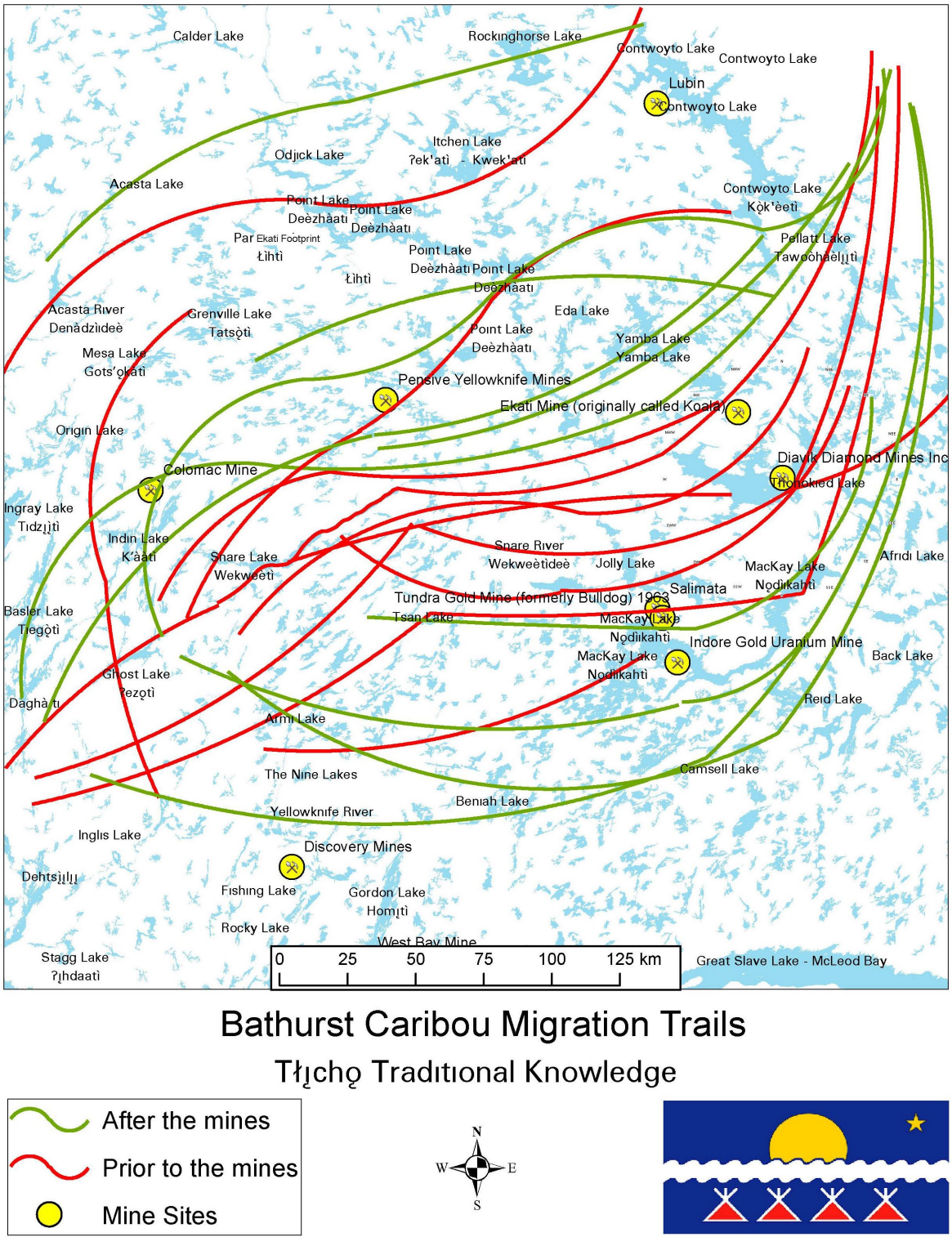


Figure 17b 2018 southern migration of caribou.



Bathurst Caribou Migration Trails

Tłı̨chǫ Tradıtıonal Knowledge

After the mines

Prior to the mines

Mine Sites

N

W E

S

Figure 18 Caribou migration trails prior to and after the Mines (Tłı̨chǫ Training Institute).

Herding & Mortality

There were no herding events for caribou at the Mine site in 2019, 2018 or 2017. In 2016, there were 2 incidents. On 18 July, a caribou was observed on the airport runway. The caribou was deterred from the runway by two staff members on foot. A second caribou was observed on the airport runway on 28 July, which staff members were able to deter by truck. No herding events took place in 2015. One caribou herding event took place in 2014, and no events occurred in 2012 or 2013. In 2011, caribou were herded away from mine infrastructure three times. There were also two herding events in 2009 – one for 27 animals near the airstrip with an incoming flight and one for a single caribou walking on the Type I rock pile. Very few herding events have been required since the mine began operating.

There were no caribou mortalities or injuries caused by mining activities in 2019. In April 2019, Environment staff responded to a call of a carcass of a caribou from a wolf kill. Similarly, in 2017, there was one natural caribou mortality from a wolf kill that Environment staff found near the mine. There has been only one caribou mortality caused by mining activities (2004) since baseline data began being collected in 1995. Caribou mortalities on East Island, from baseline to 2019 are presented in the table below.

Table 9: Caribou Mortalities on East Island, Baseline to 2019.

	Natural Caribou Mortalities on East Island	Mine-related Mortalities
Baseline (1995-1997)	8	0
2000	7	0
2001	1	0
2002	1	0
2003	0	0
2004	2	1
2005	0	0
2006	0	0
2007	1	0
2008	0	0
2009	0	0
2010	0	0
2011	1	0
2012	1	0
2013	1	0
2014	1	0
2015	0	0
2016	0	0
2017	1	0
2018	0	0
2019	1	0

Support

The GNWT (Environment and Natural Resources, ENR) has been leading a working group to determine the best approach(es) to monitoring and DDMI will consider the recommendations developed as a part of this process.

In 2019, ENR developed a Bathurst Caribou Range Plan, which proposes development limitations and hierarchical management actions for different areas in the Bathurst annual range. The Mine is located in Area 2 of the draft Bathurst Caribou Range Plan, which has a proposed moderate development level and status of cautionary. Diavik is in compliance with recommended mitigation described in the Bathurst Caribou Range Plan

Diavik contributed financial support to the GNWT to develop models for Bathurst caribou winter range habitat selection in 2015 and to increase the number of GeoFence collars on the herd in 2016. A Comprehensive Analysis Report was completed for wildlife monitoring results at Diavik following the 2016 monitoring year. At the request of EMAB, the results were used to determine the number of caribou in a given area (density) over the aerial survey route, in order to determine if the ZOI results in an unnatural increase of caribou outside of that zone. The result (1.62 animals/km2) is within the mine-related and natural levels of change seen in the study area from 1998 to 2012.

Grizzly Bear

Will the distribution or abundance of grizzly bears be affected by the mine development?

EA Predictions and Overall Status:

- ***Approximately 8.7 km² of grizzly bear habitat will be lost and there will be some avoidance of the area, but the abundance and distribution of grizzly bears in the regional area will not be affected measurably;***

Bear habitat loss has remained below the value predicted; effects on the abundance and distribution of grizzly bears have been minimal

- ***The maximum zone of influence from mining activities is predicted to be 10 km; and,***

Efforts to determine a ZOI for bears were not successful

- ***Bear mortalities due to mine related activities are expected to average 0.12 to 0.24 bears per year over the mine life.***

Mine-related bear deaths have remained low and below the predicted rate

Observations:

Habitat

The amount of grizzly bear habitat that has been lost to date (in square kilometers) is 8.02 km², which falls below what was predicted (8.67 km²).

Mortality

The calculated mine mortality rate for grizzlies over the past eighteen years (since 2000) is 0.05, which is below the range predicted. One mortality occurred at the mine in 2004.

Abundance/Distribution

There were a total of 80 grizzly bear visits to the mine site during 2019, which is similar to the 90 visits in 2018. This number is not considered to be the number of bears in the Diavik area, as it is likely that these sightings include multiple observations of the same bear due to repeat visits to East Island. The number of grizzly bear sightings in any given year does not appear to be influenced by the number of people on site (Table 10) however, staff reporting incidental observations does foster an awareness of wildlife issues at the Mine.

Table 10: Average Camp Population and Number of Incidental Grizzly Bear Observations, 2002-2019.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ave # ppl in camp	1100	470	397	646	716	747	979	562	579	630	629	537	484	524	625	641	578	586
# Bear on island	5	19	24	43	21	41	5	22	44	56	97	67	69	77	94	89	90	80

- Grizzly bear habitat surveys were conducted from 2001 to 2008, but they were not successful at determining a ZOI for bears within the study area. Diavik submitted a request to remove the Zone of Influence monitoring requirement and this was supported by GNWT-ENR and EMAB.

- There was a change in the way grizzly bears in the Diavik and EKATI mine areas are studied in 2012, as well as for De Beers Canada Inc. properties. TK/IQ was used to identify the preferred habitat of grizzly bear and then determine the location in which to set the 113 posts to collect hair samples. Community assistants were also involved with post construction and deployment. The study was conducted in the summers of 2017, 2013 and 2012, for the Diavik and EKATI mines, and De Beers completed it in 2017, 2014 and 2013. The results (Table 11) show a stable to increasing number of grizzly bears in the northern section relative to monitoring completed in the late 1990's. Data analysis indicated that there have been no negative impacts on the regional population of grizzly bears (i.e. populations are stable to increasing) due to the Ekati and Diavik mines; therefore, the long-term monitoring frequency will be discussed at the next wildlife monitoring workshop and determined with partners.

Table 11: Number of Grizzly Bears Identified during DNA Analysis.

Year	# samples	Individuals	
		Male	Female
2012	1,902	42	70
2013	4,709	60	76
2017	3,657	55	81

Wolverine

Will the distribution or abundance of wolverine be affected by the mine development?

EA Predictions and Overall Status:

- ***The mine is not predicted to cause a measurable shift in the presence of wolverines in the study area; and***

Wolverine presence has been variable within the study area across the years

- ***Mining related mortalities, if they occur, are not expected to alter wolverine population parameters in the Lac de Gras area.***

Mine-related wolverine deaths have not altered the population in the area; a decrease has been observed but is likely related to the caribou population

Observations:

Wolverines were observed on East Island 21 times during 2019, which is slightly lower than the previous year. These observations are not recorded systematically and contain repeat sightings of the same animal. A total of 12 deterrent actions were used during 7 of the 21 observations. The most used deterrent was an air horn. Two relocations of wolverine occurred in 2019, one on 15 January and one on 17 January. There were no wolverine deaths in 2019. Although there were two relocations in 2019, relocations and mortalities continue to be uncommon at the Mine.

- Since 2000, five wolverines have been relocated and five mortalities have occurred at the Mine. There were two relocations and one wolverine found dead at the Mine in 2016 (Table 12).

Table 12: Wolverine observations, relocations and mortalities, baseline to 2019.

	Baseline[(a)]	2000-2004	2001	2002-2007	2008	2009-2011	2012	2013-2014	2015	2016	2017	2018	2019
Days with Visits	27/year Total = 82	25	36	149	46	53	11	9	118	105	44	28	46
Relocations	1	0	2	0	0	0	0	0	1	2	0	0	2
Mortalities	1	0	1	0	1	0	2	0	0	1	0	0	0

(a) Includes wolverine occurrences recorded at three different camps (i.e. Diavik, Kennecott, and/or Echo Bay Road camps) annual numbers are not available for baseline investigations.

- A large portion of the 2015 sightings were of the same individual that was relocated on 23 March 2015. The number of occurrences of wolverine on East Island in 2008 was higher compared to other years (46); however it is important to realize that many of the sightings were of a male animal that was denning under South Camp and another wolverine that had a snow den on the west side of East Island.

Snow Track Survey

Snow track surveys began in 2003, and have been conducted with the assistance of community members, as available. In 2008, Diavik revised the wolverine track survey in favour of an increased number of transects of standard length compared to the surveys completed in previous years. They are 4 km straight lines that are randomly distributed throughout the study area, but some bias is placed on tundra areas identified as preferred habitat for wolverine based on TK. A second survey has been completed to estimate detection of wolverine snow tracks since 2015. Snow track survey results are presented in Table 13.

A total of 46 tracks were found over two transect surveys from 23 March to 21 April 2019, with an average track density of 0.09 tracks/km for the first survey and 0.20 tracks/km for the second survey. Community assistants from the Lutsel K'e Dene First Nation and from Whati helped carry out the survey in 2019. Results from the most recent review of snow track data indicate that the occurrence of snow tracks have increased in the study area through time from 2003 to 2016.

Table 13: Wolverine Track Index, 2003-2019.

Year	Survey Period	Number of Tracks	Distance Surveyed (km)	Track Index (Tracks/km)
2003	April 10 – 12	13	148	0.09
2004	April 16 – 24	22	148	0.15
2004	December 2 - 8	10	148	0.07
2005	March 30 – 31	7	148	0.05
2005	December 7 – 12	18	148	0.12
2006	March 30 – 1	5	148	0.03
2008	April 30 – May 2	15	160	0.09
2009	April 2 – 4	11	156	0.07
2010	No community assistant available			
2011	March 30 – April 3	23	156	0.15
2012	March 28 – April 3	22	160	0.14
2013	April 2 – 6	26	156	0.17
2014	March 23 – 26	25	160	0.13
2015	March 24 – March 29	21	160	0.13
2015	April 14 – April 17	17	160	0.11
2016	March 22 – March 27	50	160	1.25
2016	April 8 – April 13	50	160	1.25
2017	March 22 – April 4	10	160	0.06
2017	April 9 – April 19	42	160	0.26
2018	March 23 – April 11	10	132	0.08
2018	April 13 – April 22	4	132	0.03
2019	March 23 – April 2	14	160	0.09
2019	April 12 –April 21	32	160	0.20

Snow Survey Conclusions

Key highlights from 2019 Wildlife Monitoring Report analysis of snow track data showed that;

- Wolverine tolerate low level activity but may reduce their use of the study area as Mine activity increases.
- Habitat was found to have a small effect on colonization rates and transects with lower quality habitat were found more likely to be colonized. Wolverines may be changing their habitat selection over time in response to varying environmental pressures (e.g., food availability, competition) and what is considered high quality habitat in one year may not be consistent over time.
- Changes in population growth were weakly correlated with annual occupancy rates.

The analysis of the data showed that conducting multiple snow tracking surveys within a year is integral to correctly estimating occupancy rates, as wolverine detectability is relatively low at around 40%. Which was not surprising because wind and snowfall have been variable during the surveys among years. Continued monitoring of wind and snow conditions will help make accurate and unbiased estimates of detectability, and subsequently occupancy, in future years.

The data and analyses showed a small amount of variation in wolverine occupancy over time that was seldom below 70%. This suggests that wolverine occupancy in the study area has changed little from 2008 to 2019 despite the increased probability of extinction in response to higher Mine activity levels (i.e., FTE). In other words, annual declines in occupancy due to higher Mine activity do not have long lasting effects on wolverines, as they will reoccupy transects in the study area in years with lower Mine activity. Although there are only two years of overlap with wolverine density estimates at Diavik from 2005 to 2014, a similar stable trend was reported using DNA hair sampling data.

- Results from the 2017 comprehensive analysis of snow track data indicate that track density index (TDI) and occurrence of snow tracks have increased in the study area through time from 2003 to 2016. These patterns appear unrelated to the Mine, although both TDI and occurrence were negatively correlated with the amount of waste rock production.

Wolverine Hair Snagging

Diavik participates in a joint wolverine DNA research program with the GNWT and EKATI mine in certain years. This program was conducted at Diavik in 2005, 2006, 2010, 2011 and 2014 and the study area is associated with the Diavik, Ekati, Snape Lake and Gacho Kue mines, and Daring Lake. In 2018, a study of the data suggested that mine-related effects are very small if present, which is consistent with the long-term results of Diavik's snow track monitoring program and recorded annual adverse wolverine-Mine interactions. A key finding of the study was that wolverine across these study areas function as a single population, so there is limited utility for this type of monitoring to detect separate mine related effects. The study reported that the number of individual wolverine captured in the study has ranged from 17 to 24 wolverines from 2005 to 2014 with an estimated density of 2.2 wolverine per

100 km². The program frequency depends on the number of individuals identified and could be repeated every four to six years to detect an annual decline of 5%.

The long-term duration and frequency of this program has not been determined collaboratively at wildlife monitoring workshops hosted by ENR. The schedule for future monitoring programs is yet to be determined.

Raptors

Will the distribution or abundance of raptors be affected by the mine development?

EA Predictions and Overall Status:

- ***Disturbance from the mine and the associated zone of influence is not predicted to result in measurable impacts to the distribution of raptors in the study area; and***

Negligible impacts to the distribution of raptors in the mine area have been observed

- ***The mine is not predicted to cause a measurable change in raptor presence in the study area.***

Raptor presence within the study area has remained similar over the years

Observations:

Since May 2005, peregrine falcons have been seen nesting on Diavik buildings and pit walls. Pit wall/infrastructure inspections are completed each year to determine use by raptors. Nests were considered active if they were observed to have eggs or young. Once a nest was confirmed to no longer be active, no further inspections were undertaken.

In 2019, a total of 45 Pit wall/infrastructure inspections were completed from 23 March until 13 September. During the inspections, two peregrine falcon nesting sites were confirmed, one at the Site Services Building and one at the Process Plant. Potential peregrine falcon nesting was also observed at A418 where whitewash was observed underneath a ledge on 28 May and an adult was heard calling on 4 July. Another case of potential nesting was recorded at A21 on 30 May where unspecified nesting behaviour was noted. Potential nesting was also recorded at A154 where peregrine falcons were observed harassing a rough-legged hawk on 9 June and on 12 June. A rough-legged hawk was observed at this location on 12 July perched overlooking the pit, with another observation on 18 July. It was unknown which species was potentially nesting at this location. Although not considered "raptors", common ravens were confirmed nesting at the South Tank Farm and A418.

No raptor incidents or mortalities were reported at the Mine in 2019.

Table 14: Nests observed on Mine infrastructure and open pits in 2019.

Area	Species	Date	Observations
A418	Common Raven	9 June	An active common raven nest was recorded on 9 June 2019. Nest success was not recorded.
Site Services Line Up Area	Peregrine falcon	4 June to 12 July	Mating was observed on 4 June and a brooding adult was observed on a nest on 12 June. Two more observations of peregrine falcon were recorded on 4 and 7 July. No observations of fledglings were recorded, and the nest was reported as inactive on 15 July 2019.

Area	Species	Date	Observations
Process Plant	Peregrine falcon	7 June, 15 June	A peregrine falcon was sighted flying over the Process Plant and Field Lab on 7 June, making calls. An occupied nest was later confirmed on 15 June.
South Tank Farm	Common raven	15 June to 21 June	An active common raven nest was recorded on 15 June and 21 June. Nest success was not recorded.

- In 2018, during the inspections, one peregrine falcon nesting site was confirmed at the Site Services Building. In addition, a rough-legged hawk was observed building a nest at A418; however, it is unclear if any eggs or young were present in this nest. Although not considered "raptors", common ravens were confirmed nesting at the South Tank Farm with two young that fledged around the 11 July. A potential nest site on the pit wall for rough-legged hawk was observed at A154 in July but was not confirmed. There were no peregrine falcons found dead in 2018.
- Two active nest sites were found in each year from 2015 to 2017. Two rough-legged hawk and 1 peregrine falcon nest were found in 2014, 4 peregrine falcon nests were seen in 2013 and one in 2012, but no raptors were found nesting at the mine site in 2010 or 2011.
- There were no peregrine falcons found dead in 2017. In 2016, one peregrine falcon was found dead at the Mine. A peregrine falcon carcass was found near the main intersection for entry to the A21 area. The carcass had been picked clean by ravens and the cause of death could not be determined.
- There were no falcon deaths at the mine in 2014 or 2015. Two falcon mortalities occurred at the Diavik Mine site in 2013. On 20 July 2013, a peregrine falcon carcass with 3 wounds was found by the A154 dike; it is suspected to have hit a power line. On 17 November 2013, a juvenile carcass that had been heavily scavenged was found below the ore storage area in the A154 pit. There was no nearby infrastructure that would indicate that the mortality resulted from the Mine. No falcons died because of mine operations from 2009 to 2011, but one peregrine falcon was found dead in 2012.

Surveys

Diavik, Ekati and the GNWT conducted falcon productivity and occupancy surveys annually in the Daring Lake, Diavik and Ekati study areas from 2000-2010 (Table 13). The falcon monitoring results from Daring Lake have been used as control data for productivity from an undisturbed area. Previously identified potential nesting sites were visited by helicopter in May each year to determine if nesting sites were occupied, and again in July to count any young in the nest.

- Nest occupancy remained relatively high in the Lac de Gras region throughout those 10 years (raptors were preferentially using the area within 14 km of the mine), supporting the prediction that mine activity levels would have a negligible impact on the presence and distribution of raptors in the study area. Annual changes in nest success were also not related to the level of activity at the mine site.
- As a result of these findings, discussions during the wildlife monitoring program review process from 2009-2011 supported a change in falcon monitoring methods to align with the Canadian Peregrine Falcon Survey (which in turn is aligned with the North American Peregrine Falcon Survey). The survey took place in 2015. The monitoring was conducted by ENR biologists and included surveys of known nest sites in early and late summer to determine nest use and the presence of hatchlings. The monitoring approach included a helicopter survey using fly-by techniques to minimize disturbance to nesting birds
- The CPFS is no longer completed; however, DDMI will still contribute surveys of nest use and success in the study area for regional monitoring by ENR and other researchers. Contribution of nest monitoring data to ENR for inclusion in regional and national databases is scheduled for every five years. The next regional survey is scheduled for 2020.
- Chick production in past years has ranged from zero to seven in the DDMI study area. Observations made over the years were consistently similar to those of the control site at Daring Lake, where productivity and occupancy rates have changed little since baseline.

Table 15: Falcon nest occupancy and production at Diavik and Daring Lake, 2000 to 2010.

Year	Survey Area	Total Sites	Occupied	Productive	Total Young
2000	Diavik	6	2	2	5
	Daring	-	-	-	-
2001	Diavik	6	2	0	0
	Daring	13	3	1	3
2002	Diavik	6	4	1	3
	Daring	18	10	9	15
2003	Diavik	6	1	0	0
	Daring	10	5	3	4
2004*	Diavik	6	5	4	7
	Daring	12	6	1	2
2005*	Diavik	6	3	1	2
	Daring	10	5	1	1
2006*	Diavik	6	3	0	0
	Daring	10	4	1	3
2007*	Diavik	6	3**	2	7
	Daring	10	1	2	8
2008*	Diavik	6	5***	2	3
	Daring	12	6	3	4
2009*	Diavik	6	4	2	5
	Daring	12	5	3	6

Year	Survey Area	Total Sites	Occupied	Productive	Total Young
2010*	Diavik	8	6	3	7
	Daring	12	5	3	7

- Daring Lake data originates from the Daring Lake research station (S. Matthews, personal communication, ENR).
- *Diavik data includes spring (occupancy only) and summer (productivity only) monitoring data. Previous occupancy values based on productivity survey only.
- **Occupancy data for May provided by BHPB and GNWT – site DVK 11 not checked
- ***Does not include additional site (DVK 19-1) found occupied during the June survey

Waterfowl

Will the distribution or abundance of waterfowl be affected by the mine development?

EA Predictions and Overall Status:

- ***At full development, 3.94 km² of aquatic habitat will be lost; and***

The amount of aquatic habitat lost to date remains below the value predicted

- ***The mine is not predicted to cause a measurable change in waterfowl presence in the study area.***

Construction and operation of the mine has little effect on waterfowl

- ***Early open water or early vegetation growth might attract waterfowl during spring migration.***

Mine water bodies were used by birds in spring but they typically did not use them any earlier than shallow areas of Lac de Gras (e.g. east and west shallow bays)

Observations:

By the end of 2007, a total of 2.56 km² of shallow and deep water habitat had been lost due to mine development, and there had been no additional shallow or deep water areas developed since that time. With the start of development of the A21 dike in spring 2015, a total of 0.23 km² of additional water habitat was lost; 0.06 km² of shallow water and 0.17 km² of deep water. With continued A21 construction in 2016, a further 0.03 km² of shallow water and 0.47 km² of deep water habitat were lost. The total area of water habitat loss still remains below predictions (3.94 km²) at 3.12 km².

East Island shallow bays (natural bays in Lac de Gras) and mine-altered water bodies (ponds that have been changed or created for the mine site) were surveyed annually, on a daily basis, over a 5-week period during the peak spring migration (late May to late June) for waterfowl presence from 2003 to 2013. The results of surveys indicated that mine-altered water bodies are used by water birds, including ducks, geese, gulls, loons and shorebirds, during spring. However, the range of dates when water birds are first detected do not support the predictions that waterfowl or shorebirds are using mine-altered water bodies earlier than the East and West bays. As there is no similar control site that can be used for the shallow bays (they are a unique feature of the region), detailed statistical analysis on waterfowl presence is not conducted. Over the years, almost 20 different species of shorebirds have been observed, in addition to 5 species of dabbling ducks, 14 types of diving ducks and 4 kinds of geese. Each year, the shallow bays have the highest abundance of birds, followed by the north inlet. Overall, data collected suggest that construction and operation of the mine has had little effect on the presence of birds in the area.

Diavik consulted with Environment Canada, EMAB and other stakeholders about removing the requirement to monitor bird species abundance and diversity at East and West bays, given the results to date. This monitoring program was discontinued in 2014.

- Diavik has been operating 4 wind turbines since September 2012. During consultations with Environment Canada (EC) prior to installation, it was noted that no post-construction follow up monitoring for bird fatalities is required. However, Diavik voluntarily implemented a post-construction monitoring program in 2013 to assess the potential direct impacts the wind farm may have on birds. Surveys for bird carcasses below the turbines were undertaken to estimate bird strikes. Monitoring was completed by Diavik personnel twice per week, within a 50 meter radius of each turbine using the Baerwald Spiral method. In 2013, a total of 23 inspections were completed at the wind farm during post-construction mortality monitoring between 11 June and 23 August and no bird carcasses were observed. Instead of continuing with the more formal Baerwald surveys, Diavik now includes monitoring for bird mortalities at the wind turbines as part of the overall site compliance monitoring program. No bird mortalities have been observed during inspections of the wind farm are

4. Community Engagement and Traditional Knowledge

Meetings with community leadership and members, as well as school and site visits are some of the methods used to engage with communities over the years. Diavik has an approved Engagement Plan with the Wek'èezhìi Land and Water Board that was developed with review and input from the Participation Agreement (PA) organizations. The following table summarizes completed engagements relating to the environment that Diavik conducted in partnership with the PA organizations during 2019 (Table 16).

Where possible, Diavik tries to include community members in environmental monitoring programs and Earnest (Patty) Lockhart of Lutsel K'e and Lisa Marie Zoe of Whati assisted with the wolverine track surveys during 2019.

Additionally, organizations submit comments and recommendations to help Diavik improve their environmental monitoring programs, how results are presented or how Diavik responds to compliance concerns through letters to DDMI and the WLWB review process. Those submitted through the WLWB review process are recorded in the on-line registry, including DDMI's response to all recommendations. The Environmental Monitoring Advisory Board (EMAB) online library also contains technical reviews, workshop summaries and Board meeting minutes that capture reviews and recommendations that EMAB may provide to Diavik outside of the WLWB process.

There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2019.

Table 16: Community engagement during 2019.

Engagement	Location	Date
Tlicho Government		
Whati recruitment fair	Whati	January 7
Community Member – Wolverine Monitoring Program	DDMI Mine Site	March 22-28
PA Implementation Committee meeting	YK – TG office	April 17
PA Implementation meeting	YK – TG office	May 15
Elder's Focus Group – Closure Presentation	Behchoko	29 May
Tlicho Government site visit	Diavik Mine Site	June 6
PA Implementation meeting	YK – TG office	August 13
TK Panel	DDMI Mine Site	12-16 September
President Introductory meeting with TG	YK – Diavik office	October 18
President Introductory meeting with TIC	YK – TG office	October 18
Lunch meeting with RTX and James Smith Cree Nation	Yellowknife	December 3

Kitikmeot Inuit Association		
Kitikmeot Trade Show	Cambridge Bay	Feb. 11-12
PA Renewal Discussion	Telephone	June 5
PA Renewal Discussion	Telephone	July 8
PA Renewal Notice Letter	Letter	September 11
TK Panel	DDMI Mine Site	12-16 September
DDMI Business Update at KIA AGM	Cambridge Bay, NU	2-4 October
DDMI Participation in Kitikmeot Career Fair	Cambridge Bay, Taloyoak, Gjoa Haven and Kuglugtuk	November 4-8
North Slave Metis Alliance		
Closure update meeting	Yellowknife	June 4
Indigenous day volunteering	Yellowknife	June 19
NSMA Site visit w/members	DDMI Mine Site	Aug. 19
TK Panel	DDMI Mine Site	12-16 September
Lunch meeting with RTX and James Smith Cree Nation	Yellowknife	December 3
Yellowknives Dene First Nation		
SEMA Recruitment Barriers Workshop	Dettah	Feb. 7
YKDFN Site tour – winter road	DDMI Mine Site	March 14-15
YKDFN Closure Update	N'Dilo	23 April
YKDFN Career Fair	Dettah	May 10
Dechita Naowo Learning tour & HEO training class	N'dilo	May 27
Environment staff site tour	DDMI Mine Site	June 3
YKDFN Meeting	Yellowknife	July 10
YKDFN Meeting	Yellowknife	July 24
SEMA Update	Dettah	September 10
TK Panel	DDMI Mine site	12-16 September
President Introductory meeting	Yellowknife	October 11
Lunch meeting with RTX and James Smith Cree Nation	Yellowknife	December 3
Meeting with RTX and James Smith Cree Nation and Deton Cho Corporation	Yellowknife	December 3
Lutsel K'e Dene First Nation		
LEARNING TOUR _- MTS program	Lutsel K'e	January 22
Closure Update	Lutsel K'e	2 April
Community Member – Wolverine Monitoring Program	DDMI Mine Site	April 8-14
LKDFN Liaison site visit	DDMI Mine Site	May 21-23
TK Panel	DDMI Mine Site	12-16 September
Denesoline Introductory meeting w/President	Yellowknife	November 4
Meeting with RTX and James Smith Cree Nation and Denesoline	Yellowknife	December 4
SEMA and Business Update	Yellowknife	December 17
Kitikmeot Inuit Association		

Kitikmeot Trade Show	Cambridge Bay	Feb. 11-12
PA Renewal Discussion	Telephone	June 5
PA Renewal Discussion	Telephone	July 8
PA Renewal Notice Letter	Letter	September 11
TK Camp	DDMI Mine Site	12-16 September
DDMI Business Update at KIA AGM	Cambridge Bay, NU	2-4 October
DDMI Participation in Kitikmeot Career Fair	Cambridge Bay, Taloyoak, Gjoa Haven and Kuglugtuk	November 4-8

Traditional Knowledge Panel

The purpose of TK Panel Session #12 was to explore disposing of processed kimberlite (PK) in the open pits and underground mining areas (A418 and possibly A154 and A21), consider water quality and fish habitat within the pits upon closure regardless of whether there is PK in the pits, and allow for Diavik to formally respond to Session #11 recommendations around processed kimberlite made by TK Panel members (Appendix III).

The TK Panel members review closure plans for various areas of the mine, share their knowledge in relation to each topic, and present recommendations to Diavik. In this way, they are continually building their understanding of the mine site and its closure challenges, while also directly influencing Diavik's closure plans.

The goals for Session #12 were to:

- Provide input to monitoring and ensuring healthy water and fish during and after pit closure;
- Build on discussions for PK disposal; and
- Observe "with their own eyes" the pits, visit the water treatment plant, and view the North Inlet and adjacent vegetation plots.

Throughout discussions key questions were considered and discussed in relation to the session goals, and resulted in the following key guidance points:

- While fish and wildlife are smart and can sense whether habitat is healthy or safe, sometimes they don't have any choice. This is why, for example, contaminated or deformed fish have been found in other parts of the world.
- People understand fish, fish habitat and how fish survive in lakes based on their fishing experience.
- The TK Panel supports and expects ongoing rigorous scientific testing of fish, water, geology (e.g., fissures), wildlife, etc.
- The impacts of climate change on permafrost and water levels, in particular, remain a big question in peoples' minds.
- It will take time for the pits to return to a natural state that is healthy for fish.

The resulting recommendations (Appendix III) centred on the following themes as summarized below. DDMI will provide responses these recommendations to the TK panel at the next TK session.

- Pit Closure and Processed Kimberlite—Three recommendations pertained to moving the PK and PKC slimes from the PKC into the pits and redirecting future PK directly to the pits. It is important that the TK Panel witness this transfer of PK as well as the inflow of water during refilling of the pit lakes with water from Lac de Gras.

• Monitoring Water (Science)—Three recommendations spoke directly to scientific monitoring of water, specifying how the pits should be refilled with water regardless of whether PK is placed in the pits; how, how often, and where monitoring water above the PK in the pits should occur; and key baseline information that should be collected prior to any breaching of dikes in pits that have been filled with PK. TK holders depend on scientific testing of water alongside monitoring according to TK.

• Monitoring Water (TK)—The TK Panel drew upon the TK protocols and methods developed for the AEMP TK Program in making two recommendations related to monitoring water in the pits after closure. The TK Panel wants to compare water in the pits with water in Lac de Gras and only when they are comfortable with both the scientific findings and TK testing can the dikes be breached. These recommendations apply for both pits that may or may not have PK.

• Watching Fish—The TK Panel discussed at length fish habitat within the pits; whether or not they wanted to encourage fish into pits that held PK after closure; and the conditions upon which breaching the dikes may be possible. The TK Panel built upon the AEMP TK Program to put forth four recommendations related to monitoring fish in and around the pits. As with water, people need to "see with their own eyes" that fish are healthy. These recommendations apply for both pits that may or may not have PK. TK Panel Session #12 September 12-16, 2019 10

• Monitoring (Other)—Four recommendations related to innovative and non-invasive testing methods and expanding the AEMP to include monitoring of plant life, sediments, and bugs. Again, these recommendations apply for both pits that may or may not have PK.

5. New Technologies and Energy Efficiency

There are four wind turbines that operate at the Diavik mine, and staff continued to make the most of the efficiency of these turbines throughout the year. The wind turbines offset 4.1 million litres of diesel fuel use and approximately 11,000 tonnes of emissions (CO_2e) in 2019. The turbines have flashing lights to help deter wildlife and reduce bird strikes from the rotating blades. Additionally, approximately 198,963 litres of waste oil was collected to be used in the waste oil boiler during 2019. Since it was commissioned in 2014, a total of 1.2 million litres of waste oil has been burned to create heat, rather than having to ship it off-site.

In 2018 Diavik changed how the Process Plant operates. The Plant removes diamonds from kimberlite rock, and the rock ends up as either a dry coarse sand or a wetter fine sand. The Plant used to make more fine than coarse sand, but the fine sand is harder to deal with at closure. Diavik tested new technology before making this change; the positive results allowed Diavik to continue to use this method.

Diavik continues to look for new ways to reduce energy needs across site. Additional energy efficiency measures include; heat recovery from the electricity generators and boilers, use of LED lighting in buildings, installation of variable frequency drive pumps around site which limit energy requirements, decommissioning of unoccupied buildings, and reducing heat in infrequently used buildings.

6. Operational Activities & Compliance

The information below provides a summary of the operational activities that occurred during 2019 to maintain compliance with regulatory requirements outlined in Diavik's Water License, Environmental Agreement, Land Leases, Fisheries Authorization and Land Use Permits. More detailed information can be found in the Type 'A' Water License annual report. In 2019 operational and compliance activities include,

- Required SNP stations were sampled during each month. Where samples were unable to be obtained (e.g. safety concerns, weather, equipment issues), samples were re-scheduled or postponed. In 2019, parameters with Effluent Quality Criteria (EQC's) remained well below the maximum amounts allowed for in the Water License (Part H Item 26), including ammonia. Monthly SNP reports are submitted to the WLWB.
- Under ice AEMP in April/May 2019 and a comprehensive open water AEMP session in August/September 2019.
- Slimy sculpin fish study in August as part of AEMP.
- AEMP Dust Special Effects Study for dust deposition. Appendix XII of AEMP 2019 Annual Report.
- Air quality and dust deposition monitoring.
- Quarterly toxicity samples from stations 1645-18 and 1645-18B were collected in March, June, September and December 2019.
- The open pit bottom elevations were at the 8895 (A154), 8965 (A418), 9353 (A21) level, or 105m, 35m, and 353m below sea level (bsl), respectively. For comparison, the surface of the water on Lac de Gras is 415.5m asl.
- The total underground development for 2019 was 6,827m, which included 2,968m of lateral waste rock development, 133 eq m of vertical waste rock development, and 3,859m of ore development.
- Collection pond dewatering activities were conducted on a regular basis in 2019.
- The Tibbitt to Contwoyto Winter Road operations were successful and Diavik trucked loads of supplies to the mine site, and backhauled stored hazardous wastes for off-site recycling or disposal.
- The average camp population for the year was 586.

Surface Projects

- PKC: Construction of the Phase 7 PKC Dam lift continued throughout 2019.
- A21: DPS Well construction and piping installations
- WRSA-NCRP: Reclamation work for the Waste Rock Storage Area-North Country Rock Pile continued with re-sloping of the pile and installation of monitoring equipment; clean cover material was also placed on the pile in preparation for closure.
- New water fill station installed at A21 for watering roads in the A21 area.

Underground Projects (numbers below are associated with levels (masl) in the mine)

- Built the D8725 and A8770 Pump Stations
- Constructed numerous vents for air flow.
- Constructed additional sumps and transfer holes for water management.
- Installed more pipelines and pumps for water management.
- Constructed numerous safety improvements: catwalks, escapeways, MLC bays, Zacon doors, bulkheads, mandoors, and bumper blocks.

Environmental Compliance

There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2019. The 2018 Environmental Agreement Annual Report was deemed to be satisfactory by the Deputy Minister of the Government of Northwest Territories, Environment and Natural Resources on October 18, 2019. A copy of the Deputy Minister's letter on the 2018 Environmental Agreement Annual Report is provided in Appendix I.

- In 2019, there were no incidents resulting in non-compliance with Diavik's Water Licence.
- DDMI requested that the SNP section of the Water License document be updated to clarify requirements for the South Country Rock Pile, Dike Pump Station well stations and updates to the Water Management Plan. It was submitted to the WLWB on 6 March and a revised SNP was issued by the WLWB on 13 June 2018.
- There were a total of 12 spills that were reported to the NWT spill line that occurred on the mine site during 2019. Spill report forms are submitted to the GNWT and the Inspector follows up on spill clean-up.
- The GNWT Lands Inspector had no major concerns resulting from inspections in 2019.
- EMAB and other organizations submit comments and recommendations to help Diavik improve their environmental monitoring programs, how results are presented or how Diavik responds to compliance concerns through letters to DDMI and the WLWB review process. Those submitted through the WLWB review process are recorded in the on-line registry, including DDMI's response to all recommendations. The EMAB online library also contains technical reviews, workshop summaries and Board meeting minutes that capture reviews and recommendations that EMAB may provide to Diavik outside of the WLWB process.

Planned 2020 Key Operational Activities;

- Continuing the Phase 7 dam raise at the PKC Facility
- Continued efforts on placing cover materials for reclamation of the WRSA-NCRP
- Continued resloping of the WRSA-NCRP
- Continued development of the underground and open pit mines including a feasibility study on A21 underground development and A21 groundwater monitoring.
- Under-ice interim AEMP session in April/May and open water interim AEMP session in August/September.

- DDMI will continue to sample SNP stations as and when required by Water License WL2015L2-001.
- Wolverine track survey sessions, waste and compliance inspections, raptor surveys, record incidental wildlife sightings, and wildlife and air quality monitoring and dust deposition-monitoring programs.
- Installation of a food waste dehydrator and a new incinerator.

References for Further Information

Water Quality

- Monthly Surveillance Network Program (SNP) Reports
- 2019 Reports: Type A Water License, Seepage Survey Report
- AEMP Study Design Plan, Version 4.1
- Three Year AEMP Results Summary for 2014 to 2016
- AEMP Reference Conditions Report, Version 1.4
- AEMP 2019 Annual Report

All reports are available on the WLWB online registry.

Wildlife

- 2019 Wildlife Monitoring Report
- Wildlife Monitoring & Management Plan R3
- 2013-2016 Comprehensive Wildlife Analysis Report

All reports are available on the EMAB online library.

Closure/Re-vegetation/Traditional Knowledge/Community Engagement

- **CRP V4.1 (WLWB online registry)**
- Final Closure Plan – Waste Rock Storage Area/North Country Rock Pile, Version 1.2 (WLWB online registry)
- Diavik Community Engagement Plan V3 (WLWB online registry)
- TK Study for the Diavik Soil and Lichen Sampling Program, Tlicho Research and Training Institute (2013, http://www.research.tlicho.ca/research/partnerships-other-govt/traditional-knowledge-study-diavik-soil-and-lichen-sampling-study)

Air Quality

- Air Quality Monitoring Plan (EMAB online library)
- 2018 Air Quality Monitoring Report (EMAB online library)
- National Pollutant Release Inventory (http://www.ec.gc.ca/inrpnpri/default.asp?lang=En&n=B85A1846-1)

Socio-economics /Sustainable Development

- Environmental Agreement
- 2018 Sustainable Development Report (Pending)

Management & Operating Plans (as per Table 2) and GNWT Inspection Reports

- Management and Operating Plans
- GNWT Inspection Reports

Appendix I

2019 EAAR Correspondence

Mr. Richard Storrie
President and Chief Operating Officer
Diavik Diamond Mines (2012) Inc.
PO BOX 2498
SUITE 300, 5201 50TH AVENUE
YELLOWKNIFE NT X1A 2P8
Richard.Storrie@riotinto.com

OCT 18 2019

Dear Mr. Storrie: Richard.

Satisfactory determination of the 2018 Diavik Environmental Agreement Annual Report

On July 25, 2019 Diavik Diamond Mines (2012) Inc. (DDMI) submitted the 2018 Environmental Agreement Annual Report (Annual Report) as required under Article 12.1 of the Diavik Environmental Agreement (the Agreement).

An opportunity to review the Annual Report was provided by the Government of the Northwest Territories (GNWT) - Environment and Natural Resources (ENR) to the Environmental Monitoring Advisory Board (Advisory Board), the Parties to the Agreement, the Government of Nunavut, Crown-Indigenous Relations and Northern Affairs Canada, the Department of Fisheries and Oceans Canada, and Environment and Climate Change Canada, as required under Article 12(e) of the Agreement. No comments were received. ENR notes that DDMI provided a draft report to the Advisory Board and the GNWT on June 11, 2109 in accordance with Article 12.1(d) and that the Advisory Board and GNWT provided feedback to DDMI on the draft.

The GNWT is satisfied that the contents of the Annual Report are in accordance with Article 12.1 and finds the 2018 Annual Report to be satisfactory.

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If you have any questions about this process please contact Ms. Hamsha Pathmanathan, Environmental Assessment Analyst, at (867) 767-9233 extension 53106 or Hamsha_Pathmanathan@gov.nt.ca.

Sincerely,

Dr. Joe Dragon
Deputy Minister
Environment and Natural Resources

c. Grand Chief George Mackenzie
Tłı̨chǫ Government

Chief Darryl Boucher-Marlowe
Łutsel K'e Dene First Nation

Chief Edward Sangris
Dettah, Yellowknives Dene First Nation

Chief Ernest Betsina
Ndilǫ, Yellowknives Dene First Nation

Mr. William (Bill) Enge
President
North Slave Métis Alliance

Mr. Stanley Anablak
President
Kitikmeot Inuit Association

Mr. Jimmy Noble Jr.
Deputy Minister
Department of Environment, Government of Nunavut

Mr. Matt Spence
Regional Director General
Indigenous and Northern Affairs Canada

.../3

Mr. Julan Kanigan
Director, Environmental Stewardship and Climate Change
Environment and Natural Resources

Mr. Shonto Catholique
Director, Wildlife Lands and Environment
Łutsel K'e Dene First Nation

Ms. Jess Hurtubise
Regulatory Analyst
North Slave Métis Alliance

Mr. Paul Emingak
Executive Director
Kitikmeot Inuit Association

Mr. Geoff Clark
Director, Lands, Environment & Resources
Kitikmeot Inuit Association

Ms. Laura Duncan
Tłı̨chǫ Executive Officer
Tłı̨chǫ Government

Ms. Grace Mackenzie
Mines Liaison Officer
Tłı̨chǫ Government

Mr. Machel Thomas
Lands and Environment
Yellowknives Dene First Nation

Ms. Georgina Williston
Head, Environmental Assessment North
Environment and Climate Change Canada

Mr. Michael Roesch
Senior Program Manager
Indigenous and Northern Affairs Canada

.../4

Mr. Daniel Coombs
Fisheries Protection Biologist
Fisheries and Oceans Canada

Mr. Charlie Catholique
Chair
Environmental Monitoring Advisory Board

Mr. John McCullum
Executive Director
Environmental Monitoring Advisory Board

Ms. Janyne Matthiessen
Environmental Specialist
Environmental Monitoring Advisory Board

Mr. Kofi Boa-Antwi
Regulatory Advisor, Environment
Diavik Diamond Mines (2012) Inc.

Appendix II

Summary of Adaptive Management & Mitigation Measures

Table I-A Adaptive Management & Mitigation

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Waste	- Minimize waste management issues. - Maintained dump site for inert waste materials. - Waste rock is managed to reduce the chance of acid runoff.	- All domestic and office wastes are incinerated at the waste transfer area. - Use of clear plastic bags in all areas for domestic and office space waste. - New WTA facility incorporated access road around the facility to allow equipment access and snow removal during winter to reduce opportunities for animals to climb over the fence; fencing angled and extended further in to ground to prevent access to burrowing animals; extensions placed on gate & gate automated in an effort to prevent animal access; improved sump facilities for contaminated soil containment area. - New incinerator housed in a building to further prevent animal attraction & rewards. - New, more efficient incinerator that burns more cleanly & completely. - Inert solid waste facility (landfill) access restricted. - A new landfill was approved within the WRSA-NCRP. - Storage procedure for empty waste bins to minimize wildlife incidents - Liner repairs conducted in areas where seepage from the dam was	- All employees and contractors are provided orientation on proper waste management. Color-coded collection bins and posters for non-food waste around site. - DDMI Environment Staff conduct regular toolbox meeting discussions regarding waste management. - Regular waste inspections are conducted by Environment Staff at the Waste Transfer Area and Landfill. A site-wide compliance inspection is completed weekly. - Site Services implemented clear plastic bags in all domestic and office areas to allow staff to verify contents prior to disposal. - Surface Operations staff collecting waste bins inspect bins prior to pick-up and notify Environment department to arrange for sorting. - Gate installed at inert solid waste facility to limit access to dump area. - Waste rock is classified according to sulphur level and is tested and sorted prior to disposal; Underground waste rock is all classified as Type III. - The waste rock pile is designed to encapsulate the rock with the highest sulphur content, and the PKC contains	- During Inspector's visits in 2019, no concerns were raised regarding food waste, or the landfill. - Bear visits on East Island remained similar to past & bears sightings were not associated with waste management areas. - Wolverine visits on East Island were lower than in previous years. - Improper disposal of waste is identified during DDMI waste inspections (including food waste) despite training and awareness sessions with site staff, but it is minimal when compared to the volume of waste disposed. - There were no mine related wildlife deaths in 2019. - Installation of interception wells at the PKC have proven effective. - Seepage and runoff events have occurred in the past, but there were no such events in 2019. - Significant efforts undertaken to identify, inventory, remove, re-use or dispose of site infrastructure as a means of progressive reclamation. - Progressive reclamation opportunity

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
		found. - More instrumentation was added in some areas to monitor dam and rock pile temperatures and movement. - Seepage monitoring stations changed in response to observations over the years. - Re-vegetation research is testing the use of waste rock as a substrate for plant growth. - Engagement conducted and Water License Amendment Application submitted with considerations for placing PK within mine infrastructure.	the waste kimerlite rock; each of these areas are surrounded by collection ponds to capture seepage or runoff. - Seepage interception wells have been added to PKC Dams to prevent seepage through the dam. - Granite (lowest sulphur content) is the rock permitted for use as a construction material at the mine site. - Instruments were installed to monitor performance of structures such as the PKC dam and the rock pile. - Extensive lab and field (test piles) experiments are done to test how the rock pile will perform. - Sewage sludge holding cell relocated to prevent human health concerns. - Installation of a waste oil heater for the batch plant. - New approach to waste management plans includes Solid Waste & Landfill, Hydrocarbon Contaminated Materials, Incinerator Management and Dust plans. - Storage and testing procedures developed and implemented for ash. - Investigation into rock management process that resulted in incorrect placement of Type III rock; areas where Type III rock was placed have been identified, recorded and tested as required. The Inspector is satisfied that concerns have been addressed.	for WRSA-NCRP continued with re-sloping andcover placement in 2019 - Development of the WRSA-SCRP continued in 2019 which includes reporting of any metasediments identified in the A21 pit and a 2% Type III rock trigger action response plan.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Water	- Effluent is treated before being discharged to Lac de Gras, or is recycled. - Ammonia levels within water license limits. - Prevent seepage water entering Lac de Gras. - Decrease freshwater use. - Have fish and water quality that are safe for use.	- Review loading and blasting procedures and materials for opportunities to reduce ammonia levels in pit and underground water. - Re-use North Inlet water as supply water to facilities at the mine site. - Treatment plant expanded and some components re-designed to accommodate additional water flow from underground. - Evaluated the use of treated effluent for dust suppression. - Conducted a study with the University of Alberta to evaluate the biological removal of ammonia and other nitrogen compounds in the North Inlet. - Special Effects Studies (SES) are completed when unexpected effects are measured during the AEMP. - Established Action Levels to respond to findings of various parameters of the AEMP. - Evaluate seepage prevention or interception methods upstream or downstream of areas of concern. - Investigate, assess and repair site infrastructure where seepage issues arise, and where possible. - Improve turbidity curtain anchors in response to elevated TSS levels due to deep water trench and site-specific exposure issues.	- The North inlet provides retention time for mine water before treatment, allowing for ammonia reduction by natural attenuation; mine water discharge located far away from treatment plant intake. - Influent and effluent in the NIWTP is monitored consistently via instream sensors (immediate feedback) and the SNP for parameters that are indicators of water treatment effectiveness. - Daily sampling of pit, underground & effluent water to produce trends & track compliance. - Plant able to automatically stop discharging treated water that meets or exceeds DDMI's *internal* limits (which are set below the water license limits). - Sulphuric acid is available for secondary treatment of water with high ammonia levels. - Ammonia Management Plan followed to minimize ammonia loss. - Batch and paste plants utilize treated effluent as a water source instead of fresh water. - Sumps and pumps installed underground to collect and transport water to the North Inlet. - Ability to re-use water from the North Inlet and PKC, prior to	- Ammonia levels in 2019 were below the license limit of 12 mg/L. - Ammonia levels in mine water and effluent have remained low over time. - Parameters regulated in the Water License in NIWTP effluent remain well below discharge criteria. - No seepage events occurred in 2019. - Over 700 toxicity tests have been done on treated effluent since 2002 and most have been non-toxic. - Traditional Knowledge study of fish and water health completed in 2018; fish and water quality were found to be good. - Action Level response plans for AEMP results are being identified and implemented. - PK trial to reduce amount of water in fine PK and increase coarse PK completed and successful; methods implemented to Plant operations. - TSS exceedance during A21 construction; management actions in response to exceedance effective for remainder of construction season.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
		- Retrofit Process Plant to change the waste stream ratio; reduce fine PK and increase coarse PK. - Preventative work-stop measures and a TARP were established for A21 construction to reduce potential for TSS exceedances. - Clarification of License requirement for water against the PKC dams with WLWB.	treatment, to reduce freshwater intake volumes. - Frequent visual inspections of areas downstream of dams, dikes & ponds. - Seepage intercepted with the use of wells and pumps installed in PKC dams. - Repairs to damaged infrastructure to prevent seepage. - Source water (North Inlet, Collection Ponds, PKC) chemistry around site are monitored as part of the SNP. - SES to determine mercury concentration/availability in fish and sediments within Lac de Gras. - Evaluation of hydrocarbon levels in North Inlet. - Separation of water collection systems underground to capture clean groundwater and divert it to the North Inlet prior to it coming in contact with mine infrastructure/ water. - Use of absorbent berms or skimmers to remove oil from water in underground sumps. - Sediment collection sumps installed underground to separate dirt from the mine waste water. - Turbidity curtain and anchors for A21 dike construction redesigned and reinforced.	

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Wildlife	- Minimize wildlife-related compliance issues.	- Wildlife monitoring programs are adjusted based on results of previous years of studies. - Review of wildlife monitoring programs has been done with all 3 mines, Monitoring agencies, government and communities. - Study area expanded for caribou based on potentially larger mine zone of influence than predicted. - Participation in a regional wolverine DNA study with Ekati and GNWT to gain further insight on the wolverine population in the Lac de Gras region and around the mine. - Monitoring methods for grizzly bear changed to consider a more regional objective, while being safer for field crews; DNA study on the population in the Lac de Gras region. - Pit wall & infrastructure surveys for raptors that may nest in the pit or on other structures was added to the raptor monitoring program. - Raptor surveys changed to align with the North American Peregrine Falcon Survey. - Nests relocated or work activity ceased in response to wildlife presence. - Bird mortality monitoring conducted after installation of wind turbines. - Building installed to contain new	- Orientation and environmental awareness training related to wildlife on site is provided to all employees. - Employees notify Environment department of any wildlife sightings; these are then recorded. - Caribou advisory board & site-wide radio notifications for caribou presence on island. - Waste inspections conducted regularly. - Waste management system in place. - Caribou are herded away from high-risk areas, such as the airstrip, as required. - Bears are deterred from the mine site, as required. - Problem wildlife is relocated or destroyed, in consultation with the GNWT. - Wildlife reporting system is in place site-wide, for wildlife observations. - Wildlife have the 'right-of-way' on site. - No hunting or fishing is permitted by employees. - Buildings are skirted and higher-risk areas are fenced or bermed in an effort to deter animal access. - Surveys have been completed to look for caribou on roads, the rockpile and PKC when caribou are getting close to the mine.	- Mine-related wildlife incidents and mortalities have remained low over the years. - No caribou herding events occurred during 2019. - There were no wildlife deaths from mining in 2019.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
		incinerator and prevent wildlife attraction. - New Waste Transfer Area designed to minimize opportunities for scavengers to enter the area and access attractants/rewards. - Storage procedure for empty waste bins to minimize wildlife incidents. - Inclusion of community members in wildlife monitoring programs to allow consideration of both TK and science when evaluating impacts. - Recommended reduction in PVP and lichen monitoring frequency based on results and slow growth of species in sub-arctic conditions.	- Wind turbines equipped with flashing beacons designed to reduce wildlife impacts. - Mine-altered pond water levels are kept low to discourage use by waterfowl. - Re-vegetation research has been on-going for 10 years and will help to determine habitat available for wildlife after closure. - TK Panel focuses on wildlife concerns when considering closure planning options and monitoring programs. - Ground-based caribou surveys initiated when caribou are seen on site or collar maps show them approaching. - Revised storage procedure for empty waste bins on site.	

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Dust	- Isolated higher deposition levels due to construction activities (dust deposition is expected to decrease as construction activities at Diavik decrease and the mine switches from open pit to underground operations).	- Evaluate dust control measures used to minimize dust released from construction and operations. - Evaluate the use of treated mine effluent for dust suppression, which would reduce fresh water use from Lac de Gras. - Evaluate dust suppressants that can be used in key areas to reduce dust levels. - Assess vegetation and dust sample locations to provide better coverage of the area for improved data collection. - Recalculate dust emission predictions to consider underground mining methods and construction activities. - Use of BC Objectives for Dustfall at mining operations as a comparison for DDMI levels. - Additional snow core sample stations added to program. - Additional dustfall monitoring stations added to program.	- Dust suppression on roads and mine areas using water during non-freezing periods. - New crusher commissioned in 2009 is contained inside a building and has an advanced dust control and collection system. - Dust suppressant used on the apron, taxiway, airport parking lot and helipad (approved by both the Lands Inspector and Transport Canada). - Trial use of dust suppressant on parking pads and some site roads. - Addition of vegetation monitoring stations to improve ability to detect potential changes to plant cover or composition. - Modified lichen monitoring program to obtain more samples from further distances & link metal levels to caribou exposure. - Use of blast mats to control dust in smaller-scale blasts. - Obtained far-far-field (100 km away) lichen samples in 2016 to determine differences from far-field (40 km) results, in response to community concerns; little difference observed.	- Control of dust from crusher, small blast areas and roads. - Dust suppressant continued to be used on the airport's taxiway, apron, parking lot and helipad in 2019. - A21 operations resulted in higher dust levels during 2018, but they remained below the BC Objectives for mining operations. 2019 values were comparable with the 2018 data. - TSP levels in 2018 were below the GNWT 24-hr Ambient Air Quality Guideline within the vicinity of the mine site.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Air Quality	- Measure consumption of applicable sources of GHGs - primarily diesel combustion. - Meet Internal GHG Reduction Targets. - Report GHG Emissions to regulatory agencies and within Rio Tinto.	- Evaluate new technologies and equipment that may allow for pollution controls/reduced emissions. - Wind power generation research. - Determine energy draws, optimal use and options to reduce power requirements for buildings on site. - Various fuel consumption reduction initiatives, e.g. no idling. - Review of air quality monitoring program and equipment requirements. - Added monitoring of TSP in 2013 with 2 on-site stations. - Conducted energy audits on site buildings in 2014. - Determine optimal operating temperatures for the underground mine. - Evaluate energy efficient equipment options. - Evaluate and optimize transportation schedules and volumes to/from site.	- Use of low sulphur diesel. - Archaeological assessment for areas where wind turbines could be installed. - Installation of Delta V fuel consumption monitoring system for all key power consuming buildings on site. - Boiler optimization program. - Installation of 4 wind turbines, integrated into the power distribution system, to reduce fuel consumption. - New waste incinerator (with pollution prevention device). - "Waste" heat from powerhouse generators used to heat facilities connected to powerhouse (camps, maintenance shops, etc.). - Underground air quality monitoring conducted. - Improving efficiencies of plant operations to reduce power draw. - 2 TSP monitors installed at the mine site. - Installation of waste oil heaters on site. - Adjust (lower) underground mine operating temperature by 1°C. - Install energy efficient motors on underground haul truck fleet. - Optimize the glycol heat recovery system in Powerhouse 2 to reduce boiler use. - Waste Management Plan revisions to test incinerator ash and stack tests procedures.	- DDMI reports GHG emissions annually to appropriate regulators and internally to Rio Tinto. - The wind turbines offset fuel consumption by 4.2 million litres in 2019.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
			New water fill station installed at A21 in 2019 for watering roads in the A21 area.	

Appendix III

Traditional Knowledge Panel
Session 12 Recommendations and DDMI Responses to Session 11 Recommendations

Traditional Knowledge Panel Recommendations – Session #12, 12-16 September, 2019

Pit Closure and Processed Kimberlite Recommendations

12.1 The TK Panel would prefer to have the soft material that is produced from processing kimberlite (slimes) stored away from the surface so animals and humans cannot access it and accidently get caught in it. The Panel supports the option of putting the existing slimes that are in the PKC plus new slimes produced, in the bottom of the pit so that animals and people do not have access to it.

12.2 Remove the slimes that are currently in the PKC such that Diavik can start to cover the PKC to create a safe and hard surface at least three years earlier than the original closure plan.

12.3 The TK Panel needs to be on site to witness transfer of slimes and filling the pits with water (i.e., two TK Panel sessions).

Monitoring Water - Science - Recommendations

12.4 Fill the pits from the bottom up with Lac de Gras water so that water is not running down the walls of the pits. Let the water settle for a minimum of two years.

12.5 Ensure scientific tests are done every season and throughout the year to understand the health of the water and to compare water in the pits to water in Lac de Gras. Scientific water testing should include, but not be limited to temperature, turbidity, clarity, colour. The presence of micro-organisms should be measured as well as oxygen levels. Such tests should be done at various depths in the water column as far down as the PK. The results should be regularly shared with the TK Panel.

12.6 Diavik should collect baseline information on Lac de Gras from around the dikes so that impacts of breaching can be measured. The TK Panel should work with scientists to record ice thickness, wind behaviour and snow-drifting before and after dikes are breached.

Monitoring Water - TK – Recommendations

12.7 The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.

12.8 When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e.,

consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

Monitoring Fish Recommendations

12.9 Set nets for fish testing near the dikes in Lac de Gras to help get baseline information on current fish health and continue once the dikes are breached to compare.

12.10 Whether or not the dikes allow fish passage, do not build up fish habitat within the shallow pit areas where PK is placed as fish will return naturally if they sense it is safe and the nutrients and oxygen that they need are there. Focus DFO requirement for fish habitat enhancement in pits where there will be no PK. The TK Panel needs to be there to watch and provide guidance on how to enhance fish habitat.

12.11 Put fish in pit lakes to be monitored, tested and sampled before the dike is completely breached once water is deemed "safe" (i.e., at least 2-6 years of monitoring). If the fish are the same as fish in Lac de Gras according to TK testing (e.g., liver, heart, gills, bladders, etc.), carry out a second stage breach for fish passage.

12.12 Monitor fish from pit lakes according the AEMP protocols, but only taste test them if there is an acceptable comfort level and scientific results confirm that the fish are safe for eating.

Monitoring - Other - Recommendations

12.13 Install motion activated cameras around the dikes to monitor wildlife activity to see if birds and animals are trying to access pit water. Test animals if possible through noninvasive methods. Any dead animals should be tested for contaminants. Report all findings to communities and the TK Panel.

12.14 Monitor plant life, sediments and bugs in the water within the pits in the spring (after break-up), summer, and fall (before freeze-up) through our own eyes. Combine this with scientific test results. Further discussion is needed to detail this monitoring approach.

12.15 Develop details of monitoring programs (including training and employment) and action plans for community members. Expand the aquatic effects monitoring program and camp to include the TK Panel and a base for TK monitoring as one step in this plan.

Communications Recommendations

12.16 Develop an online location where all TK Panel materials will be stored and made accessible. Request that EMAB host these on their website. Communications presentations should be developed and uploaded so that they can be used by TK Panel members within their communities.

DDMI Response to Traditional Knowledge Panel Session #11 Recommendations

Processed Kimberlite and Pits/Underground

11.1 If the PK goes to the mine area, the TK Panel recommends that all of the PKC slimes also be put into the pits. There is interest in moving as much of the slimes as possible from the PKC into the mine area and away from the surface where wildlife might gain access.

DDMI Response: If Diavik receives approval to deposit PK in mine workings then Diavik will proceed to evaluate the feasibility/practicality of also moving EFPK ("slimes") to the mine workings including anticipated benefits to closure of the PKC facility. The results/recommendations from the studies will be shared with the TK Panel once complete.

11.2 If Diavik moves ahead with putting PKC slimes into the mine areas, the Panel requests to review any changes to the PKC closure plan. For example, if it is not possible to move all of the slimes in the PKC to the mine area and some of the slimes remain in the PKC, the TK Panel may recommend that the PKC is topped with large boulders to discourage wildlife and people from entering.

DDMI Response: As above.

11.3 The beach materials and rough kimberlite should stay in the PKC area (i.e., anything that can support a rock cover).

DDMI Response: Diavik will plan to leave the beach materials and rough kimberlite in the PKC area (i.e., anything that can support a rock cover).

Fish and Water

11.4 TK holders know that fish generally go where there is food (nutrients) and oxygen so they are unlikely to go to the depth where PK would be.

DDMI Response: Diavik appreciates the Panels Traditional Knowledge and insight on the subject.

11.5 The Panel would like additional scientific research to see what the effects of PK (ingestion) might be on fish specific to Lac de Gras.

DDMI Response: If Diavik receives approval to deposit processed kimberlite in mine workings then additional toxicological testing will be done on pore water collected from the deposited PK. There is no expectation that particulate PK will occur in the surface 40m where fish live.

11.6 If PK were to go in any mine area, the Panel requests an opportunity to learn more about the depth

of water for fish habitat to cover PK (TK and western science).

DDMI Response: If Diavik receives approval to deposit processed kimberlite in mine workings, Diavik has committed to a water cover greater than 50m. Pending approval, at the design stage of the project, Diavik will complete additional modelling and design based on the specific water cover depth that will be available for fish habitat above the PK and report this back to the Panel.

Next Steps

11.7 The TK Panel recommends a future TK Panel session dedicated to the health of the North Inlet upon closure and to decide if there is anything to address with the sediments.

DDMI Response: While the North Inlet was originally planned as the topic of session #12, the timing of the environmental assessment for the PKMW led both DDMI and the TK Panel to speak about pit options instead. The North Inlet will be the focus of session #13.

11.8 The Panel requests that Diavik provide a list of items/equipment that will remain and be removed from underground before flooding or filling the mine with PK/water.

DDMI Response: Diavik is developing this list with the Inspector based on what was done previously at Ekati; it will be provided to the Panel when complete.

Watching PK

11.9 The TK Panel recommends that their members are present for at least some of the time when the slimes are moved from the PKC into the A418.

DDMI Response: Diavik has made development of TK-Based assessment of pit lake conditions with deposition of PK a priority. If slimes are removed from the PKC to the mine workings, Diavik will organize a TK Panel session that overlaps with this event.

11.10 The TK Panel wants to monitor how water behaves when placed on PK. They would like to see the PK and water in the A418 as soon as it is safe to do so and when there is a good visual of the material, as well as at regular intervals afterwards.

DDMI Response: As above. This can be completed annually during the TK Panel sessions.

11.11 The TK Panel recommends that they monitor the fish habitat within the pits, shoreline modifications (e.g., ramps) for wildlife as well as the stability of the dikes on a regular and ongoing basis.

DDMI Response: As above. This can be completed annually during the TK Panel sessions.

11.12 The TK Panel recommends that they monitor freeze-up and break-up within the contained areas (i.e., within the dikes) to see if the formation and melting is any different—with a view towards safety for people and wildlife.

DDMI Response: Diavik will include recording of freeze-up and break-up within the pit lakes relative to Lac de Gras. Diavik will use air photography whenever possible so that results can be reviewed annually with TK Panel.

11.13 The TK Panel would like to see the PK vegetation plots again.

DDMI Response: This can be done during a future TK Panel Session.

11.14 The TK Panel recommends that we test slimes/PK in a fish tank to see if any water plants would grow on the PK.

DDMI Response: Diavik does not accept this recommendation as aquatic vegetation is not expected to occur at over 100m of water depth due to light limitations.

Wind

11.15 The TK Panel would like to see wind behaviour on water within the contained pits/dikes over a period of time (i.e. throughout all seasons).

DDMI Response: Diavik suggests the collection of videos during different periods of wind behavior would be a better method for making these observations; videos could be presented at the TK Panel Sessions. If PK is placed in mine workings, Diavik will video wind behaviours on water within the pit lakes and review the video with the TK Panel.

11.16 The TK Panel would like to see wind behaviour on Lac de Gras in and around the dikes. [How is the water on the outside of the dikes and breach areas affected by wind?].

DDMI Response: As above.