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23 June 2017

Subject: 2016 Environmental Agreement Annual Report for the Diavik Diamond Mine

Attached please find for review the Diavik Diamond Mines (2012) Inc. (DDMI) Environmental Agreement Annual Report (EAAR) for 2016. This document is intended to meet the commitments outlined in Section 12.1(c) of the Environmental Agreement and includes the referenced translations of the Executive Summary.

On 12 October 2016, DDMI received a letter from the Government of the Northwest Territories (GNWT) indicating that the content of the 2015 EAAR was satisfactory. A copy of this report will soon be uploaded to the Environmental Monitoring Advisory Board (EMAB) website (https://www.emab.ca/document-library), and a copy can be provided directly to any Party, upon request.

Please contact the undersigned should you have any questions or wish to discuss the report.

Yours sincerely,

Gord Macdonald
Principal Advisor, Sustainable Development

Attach.

cc: Monica Wendt, GNWT

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2016 Environmental Agreement Annual Report

Diavik Diamond Mines (2012) Inc.

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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" or EA) with 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 EA. The Diavik diamond mine was in its fourteenth (14th) year of operations during 2016, and all mining was done underground.

This report summarizes the results of Diavik's environmental monitoring and management programs during 2016. Copies of the reports listed can be found in the EMAB registry (in their office, or on-line library) or Wek'èezhìi Land and Water Board public registry.

Summary of 2016 Environmental Activities

Re-vegetation

In 2004, Diavik started doing research on ways to help plants grow back after the mine closes. This research continued in 2016, and is currently planned through to 2017 with the goals of determining: how best to grow plants from seed, how effective different planting methods are on plant growth and which conditions improve plant growth over time. The research will look at how effective it is 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 will also include more monitoring of the research plots from 2004, to see how well they are doing over time.

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 predicted in the Environmental Assessment have generally shown to be correct, travelling to the west of Diavik and Lac de Gras in spring and to the east in fall. There were no caribou deaths at the mine in 2016 and two herding events were done to move a single caribou off the runway.

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 was one wolverine and one peregrine falcon found dead on site during 2016. Regional monitoring programs are also conducted.

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 2016, the amount and quality of the dust was generally within expected levels. Permanent Vegetation Plots and a lichen monitoring study were also done in 2016 and showed reduced levels of dust on vegetation.

A total of 72 million litres of diesel were used to operate the mine site and construct the A21 dike.

Water

Diavik continued to do the Aquatic Effects Monitoring Program (AEMP) and on site Surveillance Network Program (SNP) monitoring in 2016. 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 in 2016 included water chemistry (quality), sediment (lake bottom) chemistry, plankton (tiny plants and animals in the water - amount and type) and benthic invertebrates (small bugs that live on the lake bottom - amount and type). The next AEMP Traditional Knowledge Study of fish and water health is planned for 2018.

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 PA organization to try and determine a suitable way and time to carry out such events. During 2016, Diavik's engagement with communities highlighted the final closure plan for the north country rock pile.

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 Traditional Knowledge (TK) Panel with a primary focus of considering and incorporating Traditional Knowledge into mine closure planning. The TK Panel's focus in 2016 was caribou monitoring and management for the mine site after closure.

New Technologies & Energy Efficiency

There are four wind turbines that operate at the Diavik mine, and staff continued to increase the efficiency of these turbines throughout the year. The wind turbines provided 7.6% of the mine's power needs and offset 3.4 million litres of diesel fuel use in 2016. The turbines have flashing lights to help deter wildlife and reduce bird strikes from the rotating blades.

Diavik began a test to possibly change how the Process Plant operates. The Plant removes diamonds from kimberlite rock, and the rock ends up as either a wet slime (like Jello) or in small pieces similar to sand. The Plant makes more slimes than sand, but slimes will be harder to deal with at closure. Diavik is testing new technology that could continue to be used in the Plant to make more sand and less slime.

Compliance and EMAB

On 10 July 2016, suspended sediment levels in Lac de Gras water exceeded Diavik's water license criteria while the A21 dike was being built. Incorrect disposal of some Type III rock (which can cause low quality seepage water) was also identified by the Inspector in late 2015 and DDMI has worked with regulators to address this during 2016.

There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2016. The 2015 Environmental Agreement Annual Report (EAAR) was deemed to be satisfactory by the Deputy Minister of the GNWT, Environment and Natural Resources on 12 October 2016. Applicable requests for changes to future reports have been addressed in the 2016 EAAR.

The Environmental Monitoring Advisory Board (EMAB) and Diavik exchanged letters relating to topics such as the budget and 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 2016. The continued support of Diavik's PA partners helps to make sure that environmental impacts are minimized and our resources are used wisely.

K’àodèe Godı Nek’ǫ̀ą

Dıavık sǫǫ̀mbakweè degoo xàlee sìı Ek’atì k’e East Island gòyeh k’e gòɔǫ. Canada wek’èezhìı Edzanèk’e Sǫǫ̀mbak’è kǫ̀godeè gòɔǫǫ gots’ǫ taı kw’eènǫ echı̨, chı̨k’è eyıts’ǫ k’àbatsǫ̀ ts’ǫnèe gòɔǫ hǫt’e.

2000 ekò Dıavık, dǫne sı̨làı hageèɔaa, Ję̨daà Dèek’àowodeè eyıts’ǫ Edzanè Dèek’àowo goxè Gomǫǫ̀ Gòɔǫǫ Nàowoò (EA) whehtsı̨ ı̨lè. Eyìı nàowo hòlı̨ı̨ k’e dıizì dek’enègı̨ı̨tł’èe sìı Dıavık sǫǫ̀mbak’è gòɔǫǫ wemǫǫ̀ goòɔàa ts’ǫ̀ dè eyıts’ǫ tı whelaa sìı tsı̨gowıı ts’à gıxoehdı ha dek’eèhtł’è.

Eyìı nàowo k’ę̀ę̀ godeewì gha dǫ ełexè geèhkw’ee adlà, Envıronmental Monıtorıng Advısory Board (EMAB) gìyeh. Eyìı board k’e geèhkw’ee dǫ hazǫǫ̀ gha asìı hogıihdıı dǫǫ̀ agı̨ı̨t’e, nàowo dànì weghàladaa eyıts’ǫ dànì ek’èt’ìì gha kehogıihdı. 2016 ekò sǫǫ̀mbakweè xàgelee gha Dıavık sǫǫ̀mbak’è gogèhtsı̨, hoòno daats’ǫ̀ dı̨ xo gots’ǫ weghàlada, dègoyìı gots’ǫ sǫǫ̀mbakweè xàgele hǫt’e.

Dıı wegodìı nek’ǫ̀ą k’e 2016 ekò Dıavık dànì dè eyıts’ǫ tı gha kehogı̨ı̨hdı eyıts’ǫ ayìı k’e eghàlagı̨ı̨dàa sìı wek’e dek’eèhtł’è. Wexèht’eè godıì nı̨htł’è board k’e geèhkw’ee (EMAB) gını̨htł’èkǫ̀ whela hanì-le-dè satsǫ̀ t’à asìı xàetaa k’e dek’eèhtł’è. Dè Wek’èezhìı eyıts’ǫ Tı k’e ełexè Geèhkw’ee gını̨htł’èkǫ̀ sı whelaa hǫt’e.

Godı Nek’ǫ̀ą t’à 2016 k’e Dè Gomoò Gòɔǫǫ k’e Ayìı Dàts’ı̨ı̨là.

Ję̨t’ǫ̀ą Nagoehsee

2004 ekò Dıavık sǫǫ̀mbak’è gòɔǫǫ wedaètǫ tł’axǫǫ̀ nı̨dè dànì dè nagoehseè agele gha gıxàeta xèhogı̨ı̨hwho. 2004 gots’ǫ 2016 ts’ǫ̀ hageť ı̨ eyıts’ǫ dıì 2017 ts’ǫ̀ ı̨łaà hageť ı̨ ha. Dànì nı̨dè ı̨t’ǫ̀ą wejìì gots’ǫ denahk’e nezı̨ı̨ xàesee, wejìì dànì dè goyìı gewa t’à denahk’e nezı̨ı̨ dehse ha eyıts’ǫ whaà hoowo tł’axǫǫ̀ dàgǫ̀ht’e t’à deɔǫ̀ nezı̨ı̨ dehse ha gıxàetaà aget’ı̨.

Sǫǫ̀mbakè wedaàtǫ nı̨dè dè wemǫǫ̀ gòɔǫǫ k’e ı̨t’ǫ̀ą ładı̨ı̨ hàɔaa dehsee k’è gòlaa sìı ayìı-seè wet’à denahk’e nezı̨ı̨ ı̨t’ǫ̀ą dehse gha gıxàeta. Sǫǫ̀mbak’è gǫchàa eyìı-le

gòʔǫǫ hanì eghàlagı̨ı̨dàa t’à nezı̨̀ agòdzà ı̨lè. Įnèe 2004 dè k’e ı̨t’ǫ̀ą nègı̨ı̨laa sìı ı̨łaà gıxoehdıı xè aget’ı̨, whaà hoòwo tł’axǫǫ̀ nı̨dè dànì dezeh gha gıxoehdı.

Tıts’aàdìı Gowhatsǫǫ̀ Edegeedaa

ı̨łaà ekwǫ̀ wexoedı hǫt’e, sǫǫ̀mbak’è gòʔǫǫ, ekǫ dǫ eghàlagıìdèe ts’ıhʔǫ̀ ekwǫ̀ xè dàgǫ̀ht’e, dànì k’ehogeʔa; ekwǫ̀ xoedıı k’è aget’ı̨ı̨ nı̨dè zǫ gıxoedı ha dìì-le. Gomǫǫ̀ Gòʔǫǫ Wexàetaa wenı̨htł’è ts’ı̨ı̨tł’èe k’e edı̨ı̨ ts’ǫ̀ ekwǫ̀ nadeeʔà ts’edıı ı̨lèe sìı ʔehkw’ıats’edıı k’ę̀ę̀ wègoèht’ì. Edaèhk’ǫ nı̨dè Dıavık gots’ǫ dą̀ą̀ ts’ǫnèe nadeeʔà eyıts’ǫ xat’ǫ nı̨dè Ek’atì gots’ǫ k’àbatsǫ̀ǫ ts’ǫ̀ nadeeʔà. 2016 k’e sǫǫ̀mbak’è gòʔǫǫ gà ekwǫ̀ wıızìı ełaı̨wo-le. Ekwǫ̀ ı̨łàet’ea nı̨htł’èk’et’ak’è nàkeè nawedeèzì adlà ı̨lè.

Nǫ̀gha, sahcho eyıts’ǫ tatsea ı̨łaà sǫǫ̀mbak’è gòʔǫǫ gà aget’ı̨. ʔı̨hk’è tıts’aàdìı dàhòt’ı̨ı̨ ekǫ aget’ı̨ı̨ taàt’eè dek’enèts’eetł’è, eyıts’ǫ ekǫ kǫ̀ gòlaa wenı edeʔǫ gehtsı̨ nı̨dè dek’enèts’eetł’è. 2016 ekò sǫǫ̀mbak’è gòʔǫǫ gà nǫ̀gha ı̨łè ełaı̨wo eyıts’ǫ tatsea ı̨łè ełaı̨wo gots’ı̨̀ı̨là ı̨lè. Sǫǫ̀mbak’è weghǫhk’eè gòʔǫǫ sı wek’aàhotǫ.

Asìı naehsee, ʔehtł’è daıdıı eyıts’ǫ Nı̨hts’ı xè Dàgǫ̀ht’e

Edaèhk’ǫ taàt’eè zah ts’ìhchıı, weta ʔehtł’è dàtłǫ gha eèk’ǫ̀ ats’ehʔı̨. Nàèdı dàhot’ı̨ı̨ eyıts’ǫ nàèdı dàtłǫ zah ta whelaa gha wek’ahota. ʔehtł’è daıdıı sı weyìı ʔehtł’èìchìı t’à nats’ehtsı̨, ʔehtł’è dàtłǫ agot’ı̨ı̨ eyıts’ǫ sǫǫ̀mbak’è gòʔǫǫ gots’ǫ edı̨ı̨ ʔehtł’è agot’ı̨ı̨ sìı wek’èhodzǫ gha. 2016 ʔehtł’è nats’ı̨ı̨htsı̨ı̨ ekò ʔehtł’è dàtłǫ agode ha eyıts’ǫ weta dàgǫ̀ht’e ha ts’ı̨ı̨wǫ sìı k’ę̀ę̀ agodzà; eyits’ǫ ekò ı̨t’ǫ̀ą aı̨łı̨ı̨ naesee k’è eyıts’ǫ adzı̨̀ı̨ wexoedıı k’è gòlaa adlàa sìı ʔehtł’è dek’aʔı̨ adzà wègoèht’ì.

Hazǫǫ̀ t’à tłeet’o łǫ̀hdı̨-akw’eènǫ daats’ǫ̀ nàke lìgalǫ haàtłǫ t’à sǫǫ̀mbak’è gòʔǫǫ eyıts’ǫ wòhdaa wet’à eʔèè A21dıke hòlı̨.

Tı

2016 k’e Dıavık, tı xè ładı̨ı̨ agot’ı̨ı̨ hogıihdıı (AEMP) eyıts’ǫ sǫǫ̀mbak’è gòʔǫǫ gà kehogıihdıı gòlaa k’è (SNP) ı̨łaà gık’e eghàlada hǫt’e. Tı hogıihdıı gha geèhkw’ee sìı eyıì-le xo nı̨dè tı wek’e sìghaı̨waà hòʔǫǫ gots’ǫ tı gìhchıı sìı gıxàetaa, sǫǫ̀mbak’è gòʔǫǫ t’à Ek’atì xè ładı̨ı̨ agot’ı̨ı̨ nı̨dè gıgòhʔàa gha. 2016 k’e asìı hàʔaa gha tı xàetaa sìı nàèdı dàhòt’ı̨ı̨ tı ta whela, tı tł’a ʔehtł’èe whetł’ıı, tèe gots’ǫ ı̨t’ǫ̀ą eyıts’ǫ asìı k’ets’àa dàtłǫ tı ta at’ı̨ı̨ eyıts’ǫ ı̨t’ǫ̀ą eyıts’ǫ gòo kw’òa tı tł’a ʔehtł’è yìı nàdèe sìı dàtłǫ tı ta whela. Įdaà 2018 k’e k’atsı̨ AEMP Whaèhdǫǫ̀ Nàowoò gha łıwe eyıts’ǫ tı xè dàgǫ̀ht’ee xàgeta ha.

Tı xè ładı̨̀ agot'ı̨̀ nı̨dè kwe nàgeehk'èe ts'ıhɔǫ̀ ı̨t'ǫ̀ą gots'ǫ ı̨t'ǫ̀ą wedıì dègotì ta łǫǫ̀ at'ı̨. Įt'ǫ̀ą wedıì łǫǫ̀ at'ı̨̀ nı̨dè wenaɔǫ̀ tı whehtǫ ts'ǫ̀ dexaetł'ì. Ek'atì ts'ǫ̀ dexaetł'ì ha ts'ı̨̀ı̨wǫ-le t'à kwe nàek'èe ha kehots'ıihdıı, eyı gha kwıìtso t'à ts'et'ı̨, eyı wedę tı sı xè nezı̨̀ı̨ eghàlats'eda eyıts'ǫ tı sıìts'ı̨̀ı̨hwhǫ.

Kǫ̀ta Goxè Łegeèhdìı / Whaèhdǫǫ̀ Nàowoò

Dıavık dè gomoò gòɔǫǫ k'e kehogıihdıı wegodıì t'à dǫ xè gogedo gıgha nezı̨. Sǫǫ̀mbak'è gòɔǫǫ wedaetı̨ ha nìhǫǫwo dè dànì adla ha k'e eghàlageedaa sìı Tłı̨chǫ xàzhìèlaa dǫ ts'ǫ̀ hagedı gıgha ha hǫt'e. Dıavık dǫ xè agot'ı̨̀ı̨ nàowoò (Partıcıpatıon Agreement) sìı hazǫǫ̀ goxè ełegeèhdì ha gı̨̀ı̨wǫ, dàht'eè hazǫǫ̀ gıgha nezı̨̀ı̨ sìı adle ha.

Dıavık, kǫ̀ta xàzhıèlaa gots'ǫ dǫ sǫǫ̀mbak'è gòɔǫǫ ts'ǫ̀ agogele ha gı̨̀ı̨wǫ, hanì-ı̨dè ededaà t'à sǫǫ̀mbak'è gòɔǫǫ ghàgeeda ha eyıts'ǫ wemǫǫ̀ dè k'e dàgǫ̀ht'ee sìı gıghàeda ha. Dǫ hazǫǫ̀ ekǫ k'egogele ha dìì hanìkò edahxǫ dǫ goxè agedzàa sìı edekǫ̀ nǫǫ̀gı̨̀ı̨de nı̨dè wet'à dǫ xè gogedo welì gı̨̀ı̨wǫ.

Dıavık gha Whaèhdǫǫ̀ Nàowoò k'e Geèhkw'ee gǫ̀hł̨. Sǫǫ̀mbak'è eneètı̨ ha nı̨dè dànì whaèhdǫǫ̀ nàowoò k'ę̀ę̀ adla ha weghǫ gots'ǫ̀ hagedı, eyıts'ǫ eneètǫ nı̨dè wetł'axǫǫ̀ dànì gòɔǫǫ ha gots'ǫ̀ hagedı. 2016 ekò Whaèhdǫǫ̀ Nàowoò k'e Geèhkw'ee sìı sǫǫ̀mbak'è wedaàtǫ tł'axǫǫ̀ nı̨dè dànì ekwǫ̀ wexoedı ha eyıts'ǫ dànì wek'èhodı ha k'e gogı̨̀ı̨de.

Wet'à Eghàlats'edaa Wegòò & Asìı Deghà Etłee

Dıavık sǫǫ̀mbak'è gòɔǫǫ ekǫ nı̨hts'ı t'à satsǫ̀etłee dı̨ gǫ̀hł̨. Dǫ gıghàladaa sìı xoghàà denahk'e nezı̨̀ı̨ etłeè agı̨̀ı̨hwhǫ. Eyìı nı̨hts'ı t'à satsǫ̀etłee sìı sǫǫ̀mbak'è gòɔǫǫ gha 7.6% yìıdıkǫ̀ ehtsı̨. Eyıt'à 2016 k'e 3.4 lemıyǫǫ̀ litres dek'aɔı̨̀ t'à etłe. Eyìı nı̨hts'ı t'à satsǫ̀etłee webeè k'e ekaàk'ǫǫ naìtł'ı̨̀ı̨ dawhelaa. Eyìı webeè ets'aetł'òo xè ek'aàk'ǫǫ naìtł'ı̨̀ı̨ t'à dek'aɔı̨̀ det'ǫ xèɔıìdı.

Dıavık, sǫǫ̀mbakweè xàgelee k'è eładı̨̀ı̨ eghàlageda ha nèhogı̨̀ı̨ɔǫ. Kwe kımberlıght ìyeh weyìı gots'ǫ sǫǫ̀mbakweè xàgele. Eyìı kwe wedęę sìı asìı ı̨loò ı̨kw'àà lanıı (jello lanì) ɔìhłè agehɔı̨̀, hanì-le dè kwe nechà-lea gots'ǫ ewaà hołè. Sǫǫ̀mbakweè xàgelee k'è asìı ı̨loò denahk'e łǫ gehtsı̨. Dıavık eładı̨̀ı̨ eghàlageda xàgeeta, hanì-ı̨dè denak'e ewaà hołè ha eyıts'ǫ dek'aɔı̨̀ asìı ı̨loò lanıı hołè agode ha.

Ek’èhogı̨ı̨ɔǫǫ eyıts’ǫ EMAB

Sǫǫ̀mba Nàzèe Zaà 10, 2016 eɔèè A21 hołè ekò Ek’atì weta ɔehtł’è doò adzà. Dıavık gıts’ǫ tı nı̨htł’è k’e ɔehtł’è datłǫ teetł’ì ha dìì-le dek’eèhtł’èe sìı wete ts’ǫ̀ adzà. Kwets’ıì Type 111 wet’à tı ta ɔehtł’è łǫ at’ı̨ı̨ sìı ekǫǫ̀-le tı ta tegı̨ı̨htł’ı nǫǫ̀. 2015 welǫ ekò La k’aehtaa dǫǫ̀ nàyèhzhì. Dıavık Sǫǫ̀mbak’è gòɔǫǫ gha k’àodèe (DDMI) 2016 k’e eyıì tı ta ɔehtł’è sıìdle ha nàowo gehtsı̨ı̨ dǫǫ̀ xè eghàlagı̨ı̨dà ı̨lè.

2016 k’e kǫ̀gòlaa gots’ǫ dǫ wıızìı sǫǫ̀mbak’è gòɔǫǫ ghǫ t’asagı̨ı̨wǫǫ t’à gots’ǫ̀ gı̨ı̨tł’è-le; dànì weghàladaa ghǫ t’asagedıì-le. 2016 Environmental Agreement Annual Report (EAAR) Xo Taàt’eè Gomoò Gòɔǫǫ Nàowoò Wenı̨htł’è Ehts’ok’eyatıı zaà k’e Edzanèè Dèek’àowo, Gomoò Gòɔǫǫ eyıts’ǫ Dè k’e Asìı Naehsee gha K’àowodeè-t’ǫǫ̀ Whedaa elı̨ı̨ sìı wegha nı̨htł’è deghà whela.

Gomǫǫ̀ Gòɔǫǫ Wexoedıı gha Geèhkw’ee (EMAB) eyıts’ǫ Dıavık ełets’ǫ̀ gı̨ı̨tł’èe t’à sǫǫ̀mba dàtłǫ wheɔǫǫ ghàà eghàlageda ha eyıts’ǫ sǫǫ̀mbak’è gòɔǫǫ t’à gomǫǫ̀ eładı̨ı̨ agòdzàa sìı dànì gıghàlada ha ghǫ ełets’ǫ̀ gogı̨ı̨de.

Dǫ gıxè eghàlats’ı̨ı̨dàa hazǫǫ̀ masìcho gìts’edı: Hotedà - Kıtıkmeot Inuıt Associatıon, Tłı̨chǫ Dèek’àowo, Sǫǫ̀mbak’è Dǫne Nàdèe, Łìhtsok’è Dǫne Nàdèe, eyıts’ǫ Waàk’ǫ̀ą - North Slave Metıs Allıance asìı hazǫǫ̀ t’à gots’àgı̨ı̨dìı t’à masìcho gìts’edı. La hołèe hàgeèɔaa eyıts’ǫ dǫ łǫ eyıì-le 2016 k’e Dıavık xè eghàlagı̨ı̨dàa sìı hazǫǫ̀ masì gıts’ı̨ı̨hwhǫ. Dǫ xè agot’ı̨ı̨ nàowo (PA) xè aget’ı̨ı̨ sìı Dıavık ts’àgı̨ı̨dìı t’à gomoò gòɔǫǫ xè deɔǫ̀ hòtł’ò eładı̨ı̨ agodzà-le eyıts’ǫ dè gots’ǫ asìı t’à ts’et’ı̨ı̨ sìı nezı̨ı̨ wet’àhot’ı̨.

Atanikavikmi Naitot

Diavik Diamond oyagakhiokvik etok kivatani kikitap talvani Lac de Gras.

300 km ogahitilaga, Canadami NWTmi, Ogahitilanga 187 1/2 miles Tonongani Kivatani Yalonaif.

Diavitkot atiliokpaktok nunalikinimot agigotinik tapkoalo talimaoyot kablonagogitot Havavilani kavamatlo malgoit 2000mi. Agigot okahimayok Diavik pitkoyaoploni Kayagitkoplogo nuna oyagakhiotilogit. Taimaitokamalo avatiliginimik oktotit naonaiyaiyit Katimayit. Elaovaktotlo agigotmi; Katimayit nunalinot kongiatiomata havap okoalo iliogaiyot kavamat avatiligiyit agigotainot. Diavik Diamond oyagakhiotit 14 nik okioni havaktot havaligamik 2016mi, enihotiklo nonat atani havakviit.

Onipkak elait piyotigiplogo Daivikmi avatiliginimik oktoktit okoalo maligaliokviop hanakiktiyotait ovani 2016mi. Ayikotait okaohit naitot pakitatot EMAB titgaini (ofasiani, ovanilonit kagitaoyami) etkilonit nunani okoalo emalikiyit katimayini Nunalgit titigaotaini.

Naitot 2016mi avatiliginiop hotiyotait Naopkaifanik (Nunamik)

2004mi, Diavik aolagotiyok havahoni kinihuni naopkaifanimot ekayotihanik honalikak Naofagiagini omikpat oyagakhiokvik. Hapna kinihianik havagiyaoyok 2016mi, taya Taimailioktot 2017mot. Ehoahitialogo enivihanot naoyagihi naoyutihanot, atogominaktot Alatkit naotitihat naotiyami kakogogalolonit. Kinilotik kongialogo piyot alatkit atologit Nunalat oyagakhiokviop haniani omivihap mikhanot. Hapna oktotaohimamat agitkianot nunami. Hapna havak munagiyaoginaktok oktotit 2004mit, kanogitahait kongiahogit kakogogalogaloak.

Angotihat

Tuktut munagiyaoginaktot havaotaohimatok kanogitahait nunagiplugit. (kongiahogit Tuktut kanoginiagiahait) oyagahiuktit holilokagotiloni kanogiliyutaoyahainik) Tuktut

Tahamogagata. Egotanigilo avatiligit kongiatiakpagait. Aolavakmata oatanot Diaviop Ovalo kivatanot okiahami Lac de Gras mi. Tuktumik tukuyokahimagituk oyagakhiokvikmi 2016mi ovalo

Malgoigoyot kihimi ataohikanik ahinogaopkaivaktot milvikmit. Kalvit, aghat ovalo kopanoakpait oyagahioviop hanianiginatot taotoknatot. Hunakagagat naonaiyak-taoginaktot kafiotilagit tahamanitpagiahaita. Emalo evaviovahotik hitiliovioplotiklonit. Ataohik kalvik tokohimayok kapanoakpaklo pakitaovaktot haniani 2016mi monahiyit Onioyaovatot.

Nikivaloit nunami, poyok hiugak ovalo hilap kanoginig
Apot ehivgiotaovaktok opingakhagagat mahanialo oktohogo poyok apotmi kanogitilagalo poyot. Poyoklo hiogak katititaovaktok oktohogo honakagiakha poyok oyagahiovikmit 2016mi taotoknaktot pikaloagitot nikivaloni.

Taimalo 18 million kalaoyok nahiok oghoyoak ataktaovaktok oyagahiotini.

Emak
Daivik holihimaginaktut emakmiklo munahiyit aolayotait tahamani kongiahogit oktoktit 2016mi. Tahapkoak oktotit ahinogakatahotik kihimi aipagogagat elituhiyomaplotik Kanogitilaganik tahip oyagakhiotinit oktokpaktut 2016mi emaklo kanogitilaga kiviyahaitalonit natkanot hunakagiahaita, (mikailo naohimayot emalo emakmiotut omayot – kanogilagalonit agitilagalonit) mikailo natkani omayot) Oktofanahoat pitkohiligiyit ekalonik emakmiklo paknaiyaktot 2018mi.

Alagonigit tatit piyotaovukmata honavaloit natkanit ovalonit kaagaktaotinit. Diavik Oktokpatot kayagiblotik tahimugakpalatailiplogit atoktatik kaagaktaotit. Atonigit kayagiplogit naliak kaagaktaotinut atonigit emalo EMAB munahinia ovalo halomahiyotait.

Nunalini Okagiyanik/Kaoyimayotuligiyit
Daivik pikamakta tohapkaiyomaploni avatiliniginilo monahiyotait ovalo ominikhap Opalogaiyaotainot nunalgitlo elaoyot. Diaviklo havaktok havakatigiplogit PA holilokaktit Ehoanikot piomaplogo hapnaholityot

Diavik emailiokpaktoklo taotoktitiplotik nunalinik elaoyonik kongiagiagini avatainik kongiagominaktonik. Ayonahonilo tamatkiotiyami ehomavaktogut kongiahimayot onioyivagonahivok nunamihot otigagamik.

Diavik otokalikiyikaktok (TK) Katimayit ehomagilogo havagat otokalikiyit ominihap Mihanot panaiyaiyanigop. Okoa (TK) Katimayiit 2016mi ehomagiyait tuktot oktunia Ovalo atanitonia oyagakhiuviop ominihata mihanot.

Notat honat ovalo aolayutit piyut

Tapkoa hitamat anogihiotit atopagait Diavikmi, ovalo havaktit atohimaginatait anogihiotit aipagopatok. Anogihiotit atokpaktot 7.6% oyagahiotini ekayotaovaktot kolitotinot ehagianamata ovalo 3-4 million oghoyoak atuktok 2016mi anogihiotit kolikaktot hogani kaklinaitomi ahipanipagiagini hogat timialo kaivitoinit kayakotigamikik. Diavik oktolikhotiklo alagotilogo oyagalikivik. Oyagalikiviop ogovaktikpatait Diamond hitiyomit, ovalo oyagak (jalotot) elivaktok hiogaoyatotlo eligaloni. Oyakikivik Jalotut elitiloapakto hiogamit. Jalotot etok kihimi ayohaotaoniaktok omitiginiani. Diavik oktuktot notamik

havaohihamik atohimagiagani atohimahogo havaohik jalotot elivalanaitomik kihimi hiogaktot.

Ovalo avatiliginimi oktutit katimayit

Ovani 10 July 2016mi taimatiat kivihimayok oktota Lac de Gras emani Diavik emamot laisikaktok havatilogit A21 mi. Ehoahiplogo pigahot oktotait oyakap (ema kovitama mikaogaloahuni) elitagiyauvaktoklo. Ehivgiotinit 2015mi ovalo DDMI havakpaktot 2016mi,

Pitkoyaoyok alagoktogo hivonihani onipkat piyaoyok 2016mi eaarmot. Okoak avatiligiyitkot Diaviklo titikiyotiyot piplogit manit, kongianit avatiligiyitkot okaoniata havohinot.

Koana/Thank you/MasiCho/Quana to KIA, Etkilgilo Kavamait, Yalonaif Etkiliit, Alalo Etkilgiit, Alatkitlo havaktit, holilokatot, havakaktot enminik elaoyotlo havaktot Diavikmi 2016mi. Atainamata ekayotiyot Diavik PA Panagiit ekayoktot emailiohotik avatiliginik monagiplogo holilokavivotlo atotialogiit.

ʔerehtł’ís Hálı̨ Ts’ı̨ Hanı Nedúwé

Dıavık dıamond mıne tsamba k’é theʔą sí, Lac de Gras húlye Jadízı́ ʔedzagh Nę́n theʔą sí ʔeyër East Island húlye nu theʔą sí ʔeyër t’a theʔą ʔat’e, Beghúldesch ts’ı̨ yudázé ts’ę́n tonona dechën hánıłtha húk’e theʔą. 2000 kú, Dıavık sǫlághe ʔełk’éch’a dëne dédlıne ts’ı̨ʔáne xa k’áldé dálı̨ sí xél chu yunághé ts’ı̨ nié ts’ę́n k’aldhër chu jadízı́ nę́n ts’ı̨ nié ts’ę́n k’aldhër xél t’at’ú ní hadı xa límashı hełts’ı̨, that’ín yatı t’á Envıronmental Agreement húlye. ʔedërı límashí sí Dıavık tsamba k’é thełʔą ghár t’at’ú nié ts’ędhır ch’á yałnı xaʔą sí bek’oréhtł’ıs, yeghár ʔeghálana xa. ʔedërı límashí hálı̨ sí ʔeyı beghár ʔedërı Envıronmental Monıtorıng Advısory Board (EMAB) húlye nuhút’ągh, thëne ts’ę́n t’así hałnı xa: ʔedërı Board sí t’at’ú ʔerehtł’ís beghár ʔeghálada xaʔą sí hałnı-u, tth’ı ní ts’ędhër ch’á t’at’ú beghálada xa snı sí ʔeyı hát’e-u háʔą xa hałnı ʔat’e. Dıavık dıamond mıne tsamba k’é thełʔą sí, dų dı̨adhel (14) gháy xa yeghálana ʔat’e, 2016 ts’ę́n-u, ʔeyı gháy k’e tsamba k’é beghálada sí, harelyú nighayaghe beghálada.

ʔedërı ʔerehtł’ís sí, 2016 k’e t’at’ú Dıavık ní hałnı-u, t’at’ú ní hadı yeghálana sí, ʔeyı ghą t’a. ʔedërı ʔerehtł’ís sí, EMAB húlye t’a ʔerehtł’ís theła sí (bets’ı̨ office theʔą sí ʔeyër-u, tth’ı computer yé t’ą́lásí ʔerehtł’ís nełʔı̨ xadúwíle bek’ání, ʔeyër tth’ı thela ʔat’e) ʔeyër thela-u, hat’ele dé, Wek’èezhìı Land and Water Board húlye ʔeyı t’a ʔerehtł’ís theła sí ʔeyër tth’ı thela ʔat’e.

2016 K’e T’at’ú Ní Badı Beghálahdą Sí Ghą Dënexél Hadı

T’ą́nch’ay nanelye

2004 kú, Dıavık tsamba k’é dárétą tł’ą́ dé t’at’ú t’ánchay dánanílye xa sí k’aunetagh húnílthër hı̨lé ʔat’e. ʔedërı bek’aunetagh sí, 2016 ʔeyı kú tth’ı ʔałú bek’aunetagh háʔą-u, 2017 ts’ę́n ʔeyı ʔałú ʔeyı beghálada xa, ʔedërı xa ts’ę́n: t’así hunesha beť’át’ı̨ t’á ʔedlát’u t’a ʔaté nezų t’ası neshe-u, tth’ı ʔełk’éch’a ts’ę́n t’ánchá dánıye sí, ʔedlát’u t’a deʔą́ą́s nezų neye t’á-u, tth’ı ʔedlát’u háʔą dé t’ánchá deʔą́ą́s nezų neye -a. ʔedërı bek’aunetagh sí, tsamba k’é theʔą bedárétągh tł’ą́ dé, ʔeyër náré t’at’ú t’ánchá nanelye sí, ʔedlát’u t’a deʔą́ą́s nezų dániye t’á, ʔeyı t’a net’ı̨ xa, t’a hurıchá sí ʔeyër nezú t’ánchá dánílye búret’ı̨ t’á. ʔedërı beghálada sí, 2004 kú t’así neshe xa nílya hı̨lé sí, dų t’at’ú dániye sí ʔeyı tth’ı net’ı̨ xa.

Ch’ądí

ʔetthę́n badı háʔą sí, ʔeyër náré ʔetthę́n dólı̨ dé ʔetthę́n t’arát’ı̨ sí (tsamba k’é theʔą t’á to ʔeyër nár t’así ʔeghálada t’á to ʔetthę́n t’arátı̨ sí ʔeyı badı) ʔeyı xa badı. Envıronmental Assessment hálı̨ hı̨lé kú, ʔeyër tsamba k’é nút’ągh dé, ʔetthę́n t’arát’ı̨ xa snı sí ʔeyı ʔełtth’ı ʔáádı, łuk’é dé, Dıavık chu Lac de Gras ch’así nas ts’ën ʔat’ı̨-u, xayt’ás dé yutth’ízı ts’ę́n ʔat’ı̨. 2016 k’e ʔı̨łágh hulı ʔetthę́n thaıdhër hı̨lı́le - u, náá ʔı̨hı̨, dzeret’áy k’é k’e nádé t’á ʔeyër ts’ı̨ yuwé níjú.

Nághaye-u, dleze-u tth'ı jíschogh tth'ı ʔeyër tsamba k'é theʔą nár búreťį nat'ǫ́. ʔeyër nár ch'ądí het'į dé bek'úríltł'ıs ʔat'e, ʔeyı ghár t'aníłt'e k'éneth t'at'ı ch'ądí het'ǫ́ sí bek'óreją xa t'á, tth'ı ʔeyër tsamba k'é theʔą kǫ́é dáthela sí, ʔeyı náré bet'ógh níle dé xa tth'ı badı. 2016 k'e tsamba k'é háʔą ʔeyër ǫłághe nághaye thaıdhër húlʔą-u, ǫłághe ǫıyes ʔeldél thaıdhër húlʔą hǫlé. Tsamba k'é háʔą ʔeyër benáré tth'ı t'así hadı háʔą ʔat'e.

T'anchay Neshe-u, Ts'ér Dzérédhı-u, tth'ı Nıłts'ı Ts'ejí Dzérédhı T'at'e Sí

Haluka hant'u, yath nálts'í-u, nalghį-u, bet'a t'aníłt'e ts'ér hulį net'į-u, t'at'ı ts'ér-u, tth'ı ʔeyı ts'ér betagh t'at'ı náídíshıne hulį sí ʔeyı tth'ı net'į. ʔeyı beghąłthën ts'ér náłtsı xa t'así dáthela sí, ʔeyı beyé net'į-u, tsamba k'é theʔą t'at'u ts'ér t'at'ú dzérédhı-u, t'aníłt'e ts'ér dzérédhı sí ʔeyı tth'ı hultá-u badı. 2016 kú, t'aníłt'e ts'ér dzérédhı-u, t'at'ı ts'ér dzérédhı xa hunıdhën sí, hát'e k'é. 2016 k'e t'ánchay dánıshe dátheʔą chu tthetsǫ́ dánıshe chu bek'e t'aníłt'e ts'ér nátł'ír sí badı hultágh ghár, ʔeyı ghay k'e k'áʔǫ́ ts'ér t'ánchay k'e náítł'ır bek'úreją.

Harelyǫ́ t'á ʔełáísdıona ts'én nák'e límëlyǫ́ lígalǫ́, that'ín yatı t'á lıtres snı sı, háníłt'e gëslín, dıesel húlye, bet'át'ǫ́, tsamba k'e beghálada xa-u, tth'ı A21 dıke húlye hałé xa.

Tu

2016 k'e, Dıavık ʔedërı Aquatıc Effects Monıtorıng Program (AEMP) húlye hálʔą ghár tu yághe t'así dánıshe t'arát'e badı ʔeyı ʔałǫ́ yeghálana-u, tth'ı Surveıllance Network Program (SNP) húlye ʔeyı tth'ı ʔałǫ́ yeghálana. ʔeyı AEMP beghár ʔeghálada sí, ǫłágh ghay hant'u Lac de Gras tu theʔą sí, net'į ʔat'e hat'e húlí, ǫłágh ghay k'e t'asízǫ́ net'į-u, ʔeyër ts'į yunedhe ghay dé, ʔedǫ́ ts'én net'ǫ, ʔeyı beghár tsamba k'é theʔą sí bet'á Lac de Gras ts'édhır dé xa badı t'á. 2016 tu t'at'e lí xa net'į-u, tu betł'agh t'at'e sí xa te tł'a hatł'és hílchu-u, teyé ts'į t'así dánechílaze búret'ǫle dániye (t'aníłt'e-u, tth'ı t'at'ı) náłtsǫ-u, tetł'agh t'así dána dólǫ (t'aníłt'e-u, tth'ı t'at'ı) ʔeyı tth'ı náłtsǫ. ʔedërı AEMP húlye beghár xa-u, 2018 kú dé, dëne ch'ání beghár łue chú tu t'at'é sí ʔeyı net'ǫ xa nút'ą ʔat'e.

That'ín yatı t'á nutrıents snı sí nítúé beta hát'ı hulį sí tátł'ír ts'ǫʔén chu bet'á ní nálk'éth, ʔeyı bet'a tu ʔedǫ ʔat'ǫ. ʔeyı háne ch'á xa Dıavık tu t'at'u surıłthën-u, t'at'u tu hałnı-u, tth'ı t'at'ú bet'á ní nálketh bet'át'ǫ sí hałnı-u, tth'ı t'aníłt'e bet'át'ǫ sí tth'ı halnı.

Háyǫrǫ́la Ts'ǫ Dëne Bexél Yatı-u, Dëne Ch'ání Ts'ǫ Haní

Dıavık t'at'ú níé ts'ędhır ch'a xa yałnı chu yuneth haʔa tsamba k'é dárétǫ ghą núdhër dé, t'at'u ʔeyı xa ts'én ʔeghálana sí ghą háyǫrǫ́la ts'ǫ dëne xél halnı nélǫ. Dıavık t'ą xél PA húlye bets'ǫ sí ʔeyı xél ʔedërı t'at'ú súghá hunıdhën k'e ʔeghálana-u, tth'ı t'o hunıdhën sí, hát'u dëne xél ʔeghálana.

ʔeyı beghąłthen, Dıavık tsamba k'é thełʔą sí, háyǫrǫ́la ts'ǫ dëne ʔeyër náílí réłdzágh, dëne ʔeyër tsamba k'é t'at'ú háʔą sí, denı té benágh t'á yeʔǫ rélʔǫ t'á. Harelyǫ́ dëne kós nálye xaʔąile húlí, t'ą kos nádél sí, háyǫrǫ́la nıdel dé, t'a heʔǫ ghą dëne xél halnı nıdé yıdhën ʔat'e.

Dıavık ʔedërı Tradıtıonal Knowledge (TK) Panel húlye sí dëne ʔeła dél̈ttth’ı-u, t’at’ú dëne ch’ání ts’ı̨ hanı bet’át’ı̨ ghár tsamba k’é dárátı̨ xa ts’én ʔeghálada sí ʔeyı hát’u hál̈ʔą ʔat’e. 2016 k’e, ʔedërı TK Panel húlye t’a k’e ʔeghádálaıhıná sí, tsamba k’é dárátą tl̈’ą́ dé t’at’ú ʔetthén badı-u, beghálada xa, ʔeyı ghą nádáıhıl̈tı.

T’así Góth Xél ʔeghálana-u, Kún K’áʔǫ́ Bet’átı

Dıavık tsamba k’é thel̈ʔą sí, ʔeyër dı̨ satsán nıl̈ts’ı hel̈tsı nechá dáthela ʔat’e, ʔeyı harelyú ghay k’e bet’át’ı̨-u, deʔą́ą́s nezú ʔeghádálana ráné. ʔedërı nıl̈ts’ı hel̈tsı satsán, bet’á 7.6% hánıl̈t’e bets’ı̨ kón t’át’ı́ -u, 2016 k’e 3.4 límëlyǫ́ lígalǫ́ gésl̈ín t’át’ı̨ ʔeyı bet’á k’áʔo bet’át’ı́. ʔeyı satsán dáthela bet’óth naratl’ír sí, bek’e kón dék’ën nareltth’ı dól̈ı̨ t’á chadí chu ʔı̨yes chu yet’árádel ʔat’ele.

Dıavık t’at’u ʔeyı tthe beghálada kú́é, Process Plant húlye ʔeyı t’at’u tthe beghálada sí ʔedu̧ ʔane xa yek’auneta húnıl̈thër ʔat’e. ʔeyı dụ satsán tthe, kımberlıte rock húlye ts’ı̨ dıamonds háíla dé, ʔeyı tthe t’a beghádhër sí, hatl̈’és lat’e (Jello lát’e) ʔat’ı́ tó, thay lát’e ʔat’ı́. ʔeyı satsán dú́ hatl̈’és lát’e ʔu̧hı ʔungą hel̈tsı, thay lát’e hanúnıle-u, tsamba k’é dárétı̨ ghą núdhër dé, ʔeyı hatl̈’és lat’e sí bet’á ʔeghálada búrenıle xa t’e. Dụ Dıavık satsán kóth t’á ʔeghálana rél̈dzagh, thay lát’ı ʔu̧hı̨ ʔungą hel̈tsı relʔı̨ t’á.

T’a Ghár ʔeghálada Xaʔą Hát’u ʔeghálada chu EMAB chu

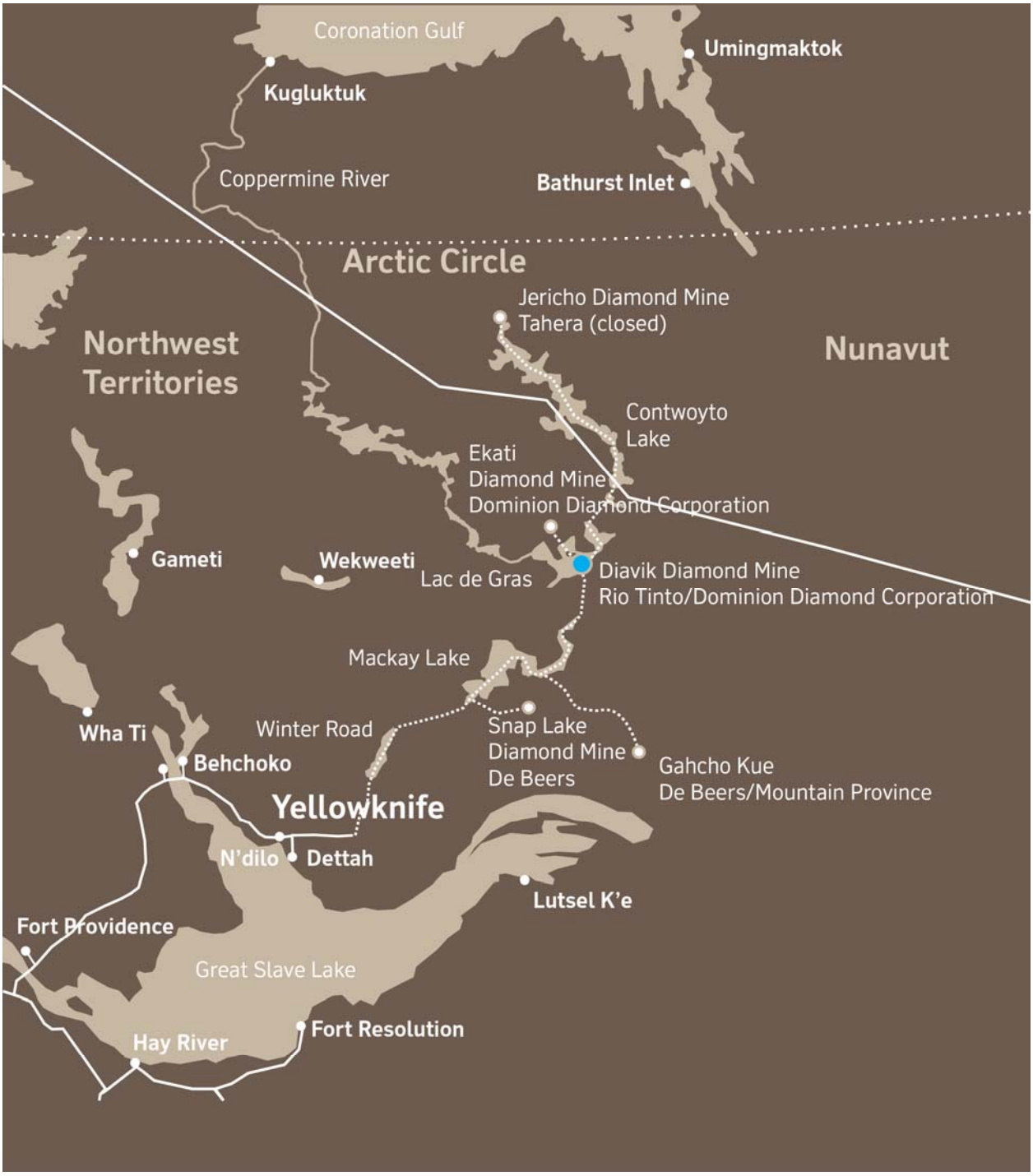
2016 Tsamba Nálye Za l̨ǫ́na núlta kú A21 dıke hal̈é t’á Lac de Grac yé t’anıl̈t’e ts’éraze dzérélı beyé sí, Dıavık yeghár ʔeghálana xa ʔerehtl̈’ís beba hálı̨ hı̨lé sí ʔeyı t’anıl̈t’e ts’éraze dzérélı xa bek’erehtl̈’ís sí, ʔeyı ʔą́ą́s ʔat’e k’é. Type III rock húlye, tthe t’at’ú ʔáldel xaʔą ʔel̈tth’íle-u ʔál̈del k’é (bet’á tu nezú chuıle hátl̈’ír), 2015 k’e ınspector húlye ʔeyı hát’e k’é yul̈ʔą t’á DDMI ní ts’ędhır ch’a betl̈’ázı́ beghálada xél yeghálaná, 2016 k’e.

2016 kú, ʔı̨l̈ágh húlı nezụ ʔeghálaınaıle nuwél̈nı-u nuwets’én rıtl̈’ís hulĺle. 2015 ts’ı̨ Envıronmental Agreement ghą ʔı̨l̈ágh ghay hant’u dënexél hadı ʔerehtl̈’ís hal̈é (EAAR) sí, jadízı́ ʔedzagh nén ts’ı̨ níé ts’én k’aldhër bechëlekuı Envıronment and Natural Resources húlye xa k’aldhër helı̨ sí 2016 Łuedal̈tí Zá nákeʔadhél núltá k’e, ʔeyı ʔerehtl̈’ís sát’ele hénı. ʔeyı ʔerehtl̈’ís t’at’ú yunéth haʔa dé ʔedú́ nolye snı sí, 2016 k’e ʔeyı hát’u hálya ʔat’e.

EMAB chu Dıavık chu ʔel̈ts’éheret’ís ʔanat’ı́, t’así ʔel̈k’éch’a ghą, tsamba ghą to, t’at’ú ní badı xa surıdhën tó ghą.

2016 k’e Kıtıkmeot Inuıt Assocıatıon-u, Tl̨cho Government-u, Yellowknıves Dene Fırst Natıon-u, Łutselk’e Dene Fırst Natıon-u, North Slave Métıs Allıance-u, ʔeyı harelyú t’ą yeba ʔeghádálana nuwets’éráínı sí márs bélídı rílʔı̨-u, bets’ı̨ busıness dól̈ı̨ sí-u, tth’ı nay dëne denı thën Dıavık bechëlekuı xél ʔeghádálana xa, ʔeyı tth’ı márs hílídı. Dıavık t’ą xél PA húlye bets’ı̨ sí chu ʔeła ʔeghálaıhena, ʔeyı bet’á ní ts’ędhır k’áʔǫ́ ʔat’e-u, ní ts’ı̨ t’a t’áít’ı̨ ʔeyı nezú súghá ts’én bet’át’ı̨.

Diavik Diamond Mine Location Map



List of Acronyms (abbreviations found in this report)

AEMP	Aquatic Effects Monitoring Program
ARD	Acid Rock Drainage
AANDC	Aboriginal Affairs and Northern Development Canada
BOD	Biological Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
DDMI	Diavik Diamond Mines Inc.
EA	Environmental Agreement or 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
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 – cleaned/treated water from the sewage or water treatment plant that is discharged from the plant after cleaning

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 for 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 man-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

$mg/dm^2/y$ – 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.

1. 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 Inc. (DDMI) 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" or EA) with 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 and closing 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 EA.

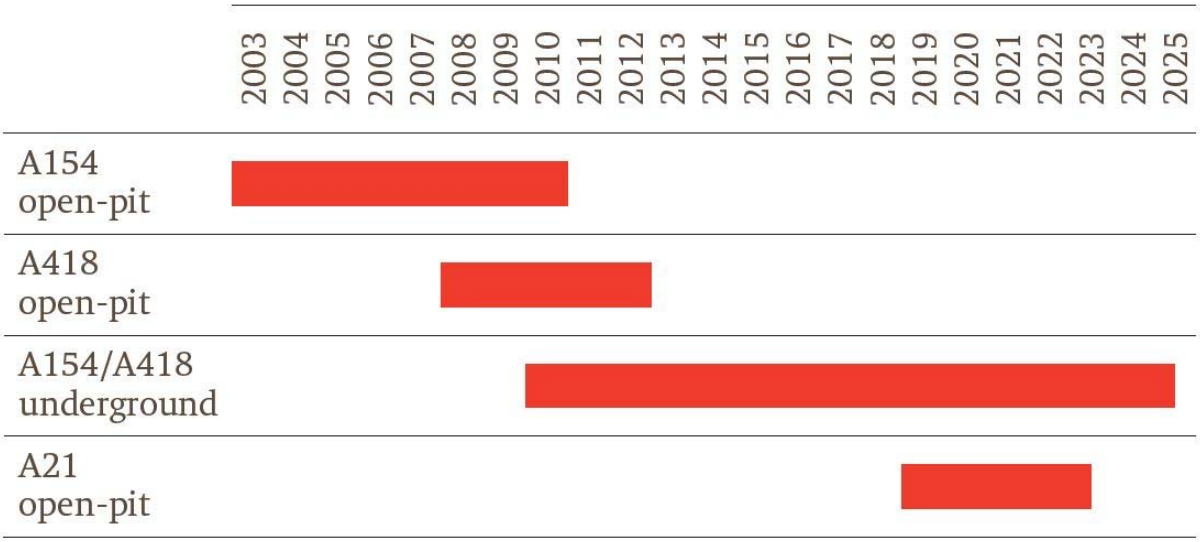
This report summarizes the results of Diavik's environmental monitoring and management programs during 2016. Complete copies of the numerous reports that Diavik submits each year can be found in the EMAB library (at their office, or on-line library) or Wek'èezhìi Land and Water Board public registry.

Operational Plans

The Diavik diamond mine was in its fourteenth year of operations during 2016, and operated as an all-underground mine. Underground mining will continue into 2017 from both the A154 and A418 pipes. Construction of a third dike to support open pit mining of the A21 kimberlite pipe began in 2015, and continued in 2016. Construction of the A21 dike will be completed in 2017, with de-watering and pre-stripping and mining is planned to begin immediately afterwards. 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 2024.

Diavik's Planned Schedule of Operations

Mine life



Mine schedule subject to market conditions, further resource evaluation, continued mine planning, etc.

Figure 1 **Diavik Diamond Mine Labelled Site Satellite Photo**

2. Environmental Agreement Annual Reporting Commitments

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

Table 1: Summary of EA Commitments in Relation to the 2016 EAAR

EA Commitment	Plain Language Interpretation (from EMAB)
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
Rolling summary and analysis of environmental effects data over the life of the Project; compare results to predictions in environmental assessment & 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
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
Comprehensive summary of operational activities during the preceding year	A full summary of mining activities during the year up to the annual report
Actions taken or planned to address effects or compliance problems	The ways Diavik is fixing any environmental effects or problems following rules and regulations
Operational activities for the next year	A summary of mining activities for the next year
Lists and abstracts of all Environmental Plans and Programs	Lists and summaries of all Environmental Plans and Programs
Verification of accuracy of environmental assessments	A check that environmental assessments are correct
Determination of effectiveness of mitigation measures	A report on how well steps to lessen effects are working
Comprehensive summary of all adaptive management measures taken	A full summary of all adaptive management steps taken
Comprehensive summary of public concerns and responses to public concerns	A full summary of public concerns and responses to public concerns
Comprehensive summary of the new technologies investigated	A full summary of the new technologies Diavik has looked into

EA Commitment	Plain Language Interpretation (from EMAB)
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
Plain language executive summary and translations into Dogrib/Tłı̨chǫ, Chipewyan, and Inuinnaqtun using appropriate media	Plain English executive summary translated into Dogrib/Tłı̨chǫ, Chipewyan, and Inuinnaqtun

3. Environmental Programs and Plans - 2016

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, plans that have not changed do not require updates; those that have been updated and submitted for regulatory approval during 2016 are identified in Table 2. Additionally, Appendix I 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, summarizes the purpose of the plans and identifies which plans were updated for 2016.

Table 2: Management & Operations Plans for the Diavik Mine

Plan & Version Number	Purpose	Updated in 2016 (Y/N)	Updates/ Comments
Ammonia Management Plan (AMP), v6	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.	Yes – submitted Dec 2016 to WLWB, awaiting approval	- Incorporate A21 operations - Required to submit 12 months prior to mining
Waste Rock Management Plan (WRMP) v7.1	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 – submitted Nov 2016 to WLWB, awaiting approval	- Address Board directives from V7 - Schedule change to Water License

Plan & Version Number	Purpose	Updated in 2016 (Y/N)	Updates/ Comments
Interim Closure & Reclamation Plan (ICRP) v3.2	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.	No (2011)	- Annual progress reports are submitted to the WLWB; not required for 2016 due to upcoming ICRP update
North Country Rock Pile (NCRP) Final Closure Plan, v1.1	Outlines closure plans for the waste rock from the A154 and A418 mines. The final closure design includes re-shaping of the pile to better fit the landscape and to provide a good surface for placement of a rock cover with caribou access ramps.	Yes – submitted to WLWB March 2016, awaiting approval	- Address Board directives from v1 - Discussion on water quality and other standards (criteria) for closure
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.	Yes – submitted March 2016 to WLWB, approved Nov 2016	- Current status of mining operations - Electronic MSDS provider information - Type of emulsion mixture used on site
Contingency Plan (CP, used to be called the Operational Phase Contingency Plan), v21	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.	Yes – submitted Dec 2016 to WLWB, awaiting approval	- External contact details - Re-organized content to make more user-friendly
Water Management Plan, v14	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.	Yes – submitted Dec 2015 to WLWB, awaiting approval	- 2015 data - Alignment with new regulatory references - Water balance - PKC dam raise plans

Plan & Version Number	Purpose	Updated in 2016 (Y/N)	Updates/ Comments
Waste Management Plan, V1.2 (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.	Yes – submitted Jan 2016 to WLWB, approved Dec 2016	- Alignment with new regulatory references - Asset disposal procedure - Landfill criteria - Waste stream sampling procedures - Dust management processes
A21 Construction Environmental Management Plan, v5.1	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.	Yes - submitted June 2016 to WLWB, approved July 2016	- Turbidity barrier requirements for 2016 - Improved description of TSS/Turbidity response plan & monitoring
Engagement Plan, v2	Outlines the outreach and engagement process with communities in relation to the requirements set out in the WLWBs Engagement Guidelines for Applicants and Holders of Land Use Permits and Water Licences (2014) and Water Licence W2015L2-0001.	Yes – submitted to WLWB Nov 2016, awaiting approval	- Include engagement on Traditional Knowledge - Update record of engagement - Update contacts & triggers tables
Processed Kimberlite Containment (PKC) Facility Operations Plan, v3.1	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.	Yes - submitted March 2016 to WLWB, approved July 2016	- Explanation of tests being done to make drier PK
North Inlet Water Treatment Plant (NIWTP) Operation Manual, v1	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 (2012)	N/A
Sewage Treatment Plant (STP) Facility Operations Plan, v3	Outlines the design and layout, operating rules, monitoring requirements, what to do in case of an emergency, maintenance and closure of the plant.	No (2011)	N/A

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 Authorization or EA. A summary of the monitoring programs conducted during 2016 is outlined in Table 3.

Table 3: Monitoring Programs for the Diavik Mine

Monitoring Program	Purpose	Completed (Y/N)	Comments
Wildlife			
Caribou Behaviour Observations	If/how caribou behaviour changes in relation to distance from mine	Y	
Aerial Caribou Surveys	Zone of Influence of mining activities in the LDG region	N	Suspended
Caribou Road Surveys	Effectiveness of mitigation measures	Y	Initiated based on collar data or reported sightings
Wolverine Track Survey	Wolverine presence in the area of the mine	Y	
Wolverine DNA	Wolverine numbers in the LDG area	N	Regional program with GNWT & other mines; not completed annually
Grizzly Bear DNA	Bear numbers in the LDG area	N	Regional program with other mines; not completed annually
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
Building Inspections	Survey mine buildings and pit walls to identify bird nests and/or wildlife use	Y	
Waste Inspections	Monitor waste disposal that may attract animals	Y	
Wildlife Presence	Track wildlife observations and numbers on the mine site	Y	

Monitoring Program	Purpose	Completed (Y/N)	Comments
Wildlife Mortality & Injury	Track any wildlife deaths or injuries associated with mine operations	Y	
Water			
Mine Site Water Quality	Test water against Water License limits at a set frequency (Surveillance Network Program, SNP)	Y	
Lake-wide Water Quality	Changes to water quality in LDG over time (part of Aquatic Effects Monitoring Program, AEMP)	Y	
Nutrients, Plants & Bugs in Water	Changes to nutrients, plants and bugs that live in the water column, over time (part of AEMP)	Y	
Lake Sediments	Changes to sediment quality in LDG over time (part of AEMP)	Y	
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
Fish Health	Fish health tests through palatability and/or tissue chemistry	Y	Slimy Sculpin monitoring
Water Quantity	Measure levels and sources of water used, added or moved on site	Y	
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	
Total Suspended Particulates	Continuous monitoring of the amount of small dust particles that are emitted from mine operations	Y	
Meteorological	Weather trends and influence on water balance and dust deposition	Y	
Wildlife Habitat Loss	Track habitat lost due to mine development; total loss and preferred habitats for individual species	Y	
Vegetation Plots	Changes to type and amount of plants over time, near and far from the mine	Y	Completed every 3-5 years

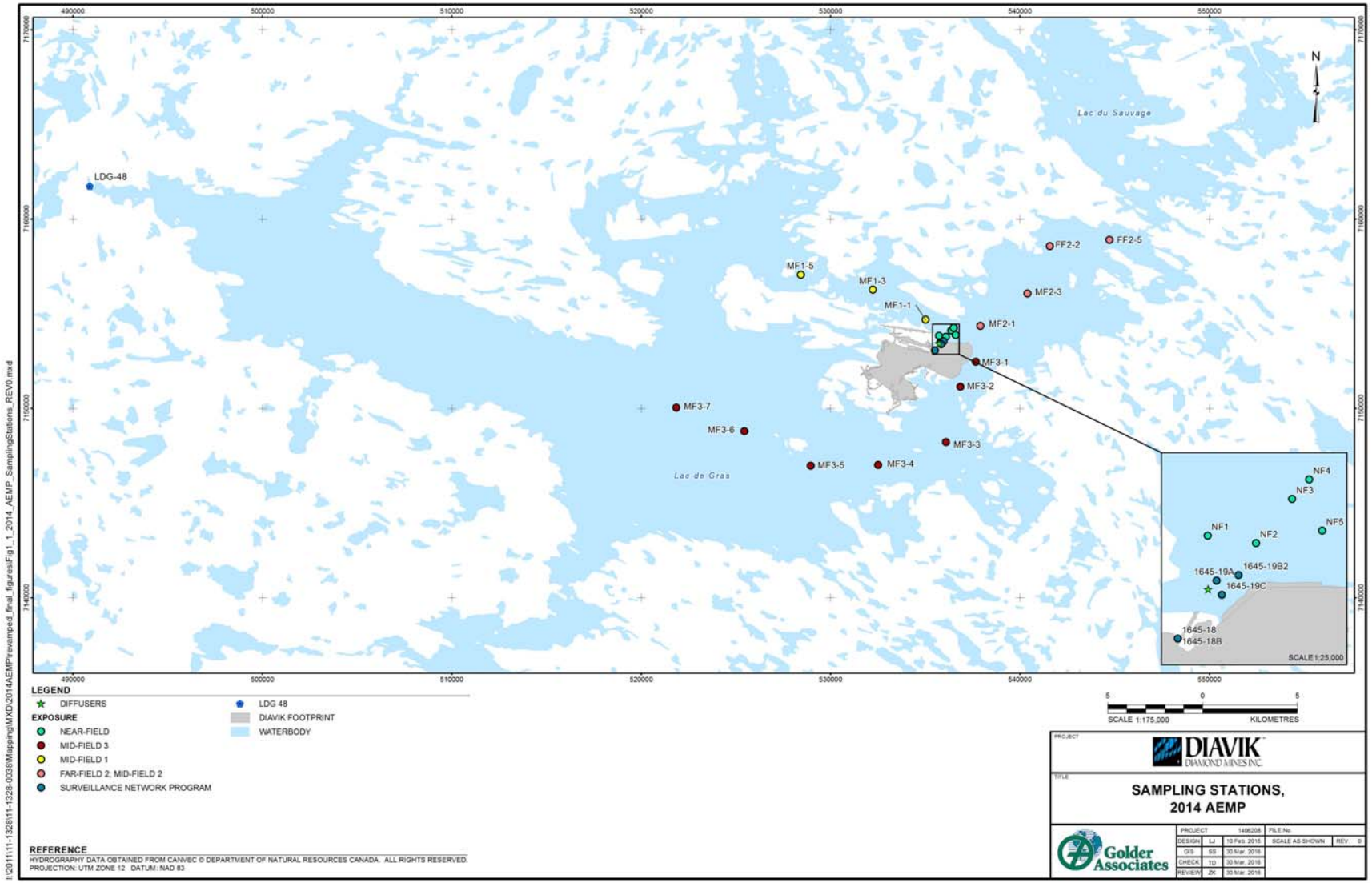
Monitoring Program	Purpose	Completed (Y/N)	Comments
Lichen Study	Metal levels in lichen and soil, near and far from the mine; included health assessment for caribou consumption	Y	Completed every 3-5 years

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 be measured). There are also sampling stations far away from the mine (where effects would take much longer to measure). 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 37 sample locations (Figure 2) where many different types of samples are taken. The types of samples that were collected in 2016 included: water quality (e.g. ammonia, metals), the amount and quality of dust deposited, sediments (mud) on the lake bottom near the area where treated water is discharged back in to Lac de Gras, nutrient indicators (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), benthic invertebrates (small bugs that live on the bottom of the lake) as well as fish health (Slimy Sculpin).

Figure 2 2016 AEMP Sample Locations



Air Quality (Dust & Emissions)

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

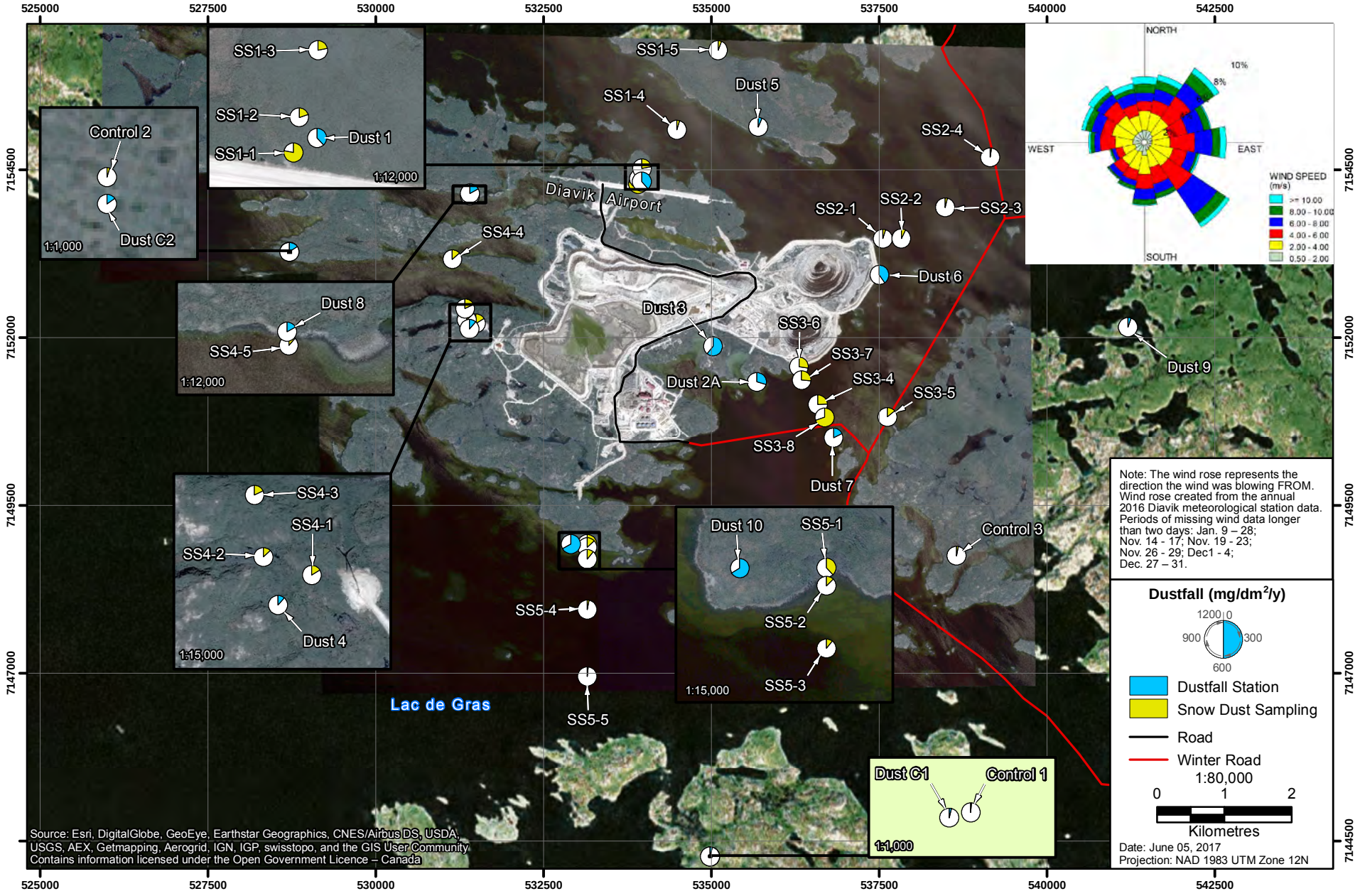
The sampling stations for the Dust Deposition Monitoring Program (Figure 3) were set up using a transect approach (series of sample locations that extend outwards on ice and land from the mine site). Three sample sites were added to the snow survey in 2014 (SS3-6, SS3-7, SS3-8) and Diavik now monitors:

- 12 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 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 TSP concentrations (TSP – 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) continuously, and hourly concentrations are recorded.

Figure 3 **2016 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 to Lac de Gras during dewatering activities (e.g. dike construction).

Diavik monitors dams and dikes around the mine site for 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 (leaks) 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 address seepage issues. The monitoring includes regular inspections of the dam and dike structures and collection of water samples. Typically, leaks occur from May through to the beginning of October. The PKC holds enough water that it does not completely freeze in the winter, and therefore seepage can occur all year round.

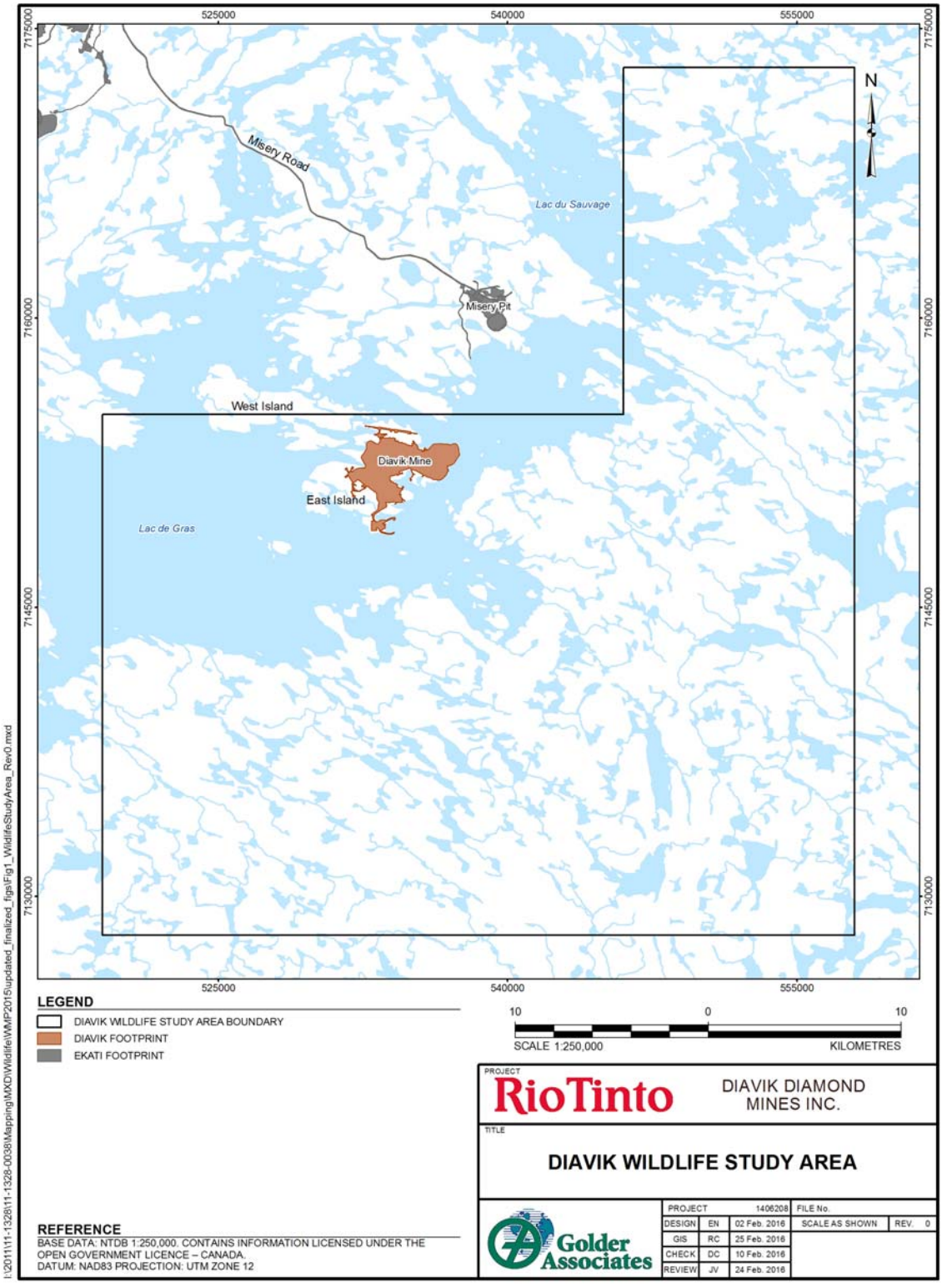
Diavik has a drainage control system to collect seepage before it enters Lac de Gras. It includes a number of collection wells and ponds (Figure 4), which surround major structures such as the PKC, and are monitored. There are some times where runoff from other areas of the mine may not go into a pond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

Figure 4 **2016 Mine Water Quality (SNP) Sample Locations, including A21**

Wildlife & Plant Monitoring

Diavik developed a wildlife monitoring program to check if the actions taken to reduce impacts to wildlife 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.

Figure 5 Regional Wildlife Study Area for the Diavik Mine



4. 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 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 EMAB's Annual Report.

Water and Fish

At Diavik, water quality and fish health are monitored through the 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:

- Water will remain at a high quality for use as drinking water and by aquatic life (i.e. meet CCME thresholds);
- Localized zones of reduced quality during dike construction;
- 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);
- Post-closure runoff (water flowing off the mine site) expected to affect the quality of two inland lakes.

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 (midges) of bugs 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.

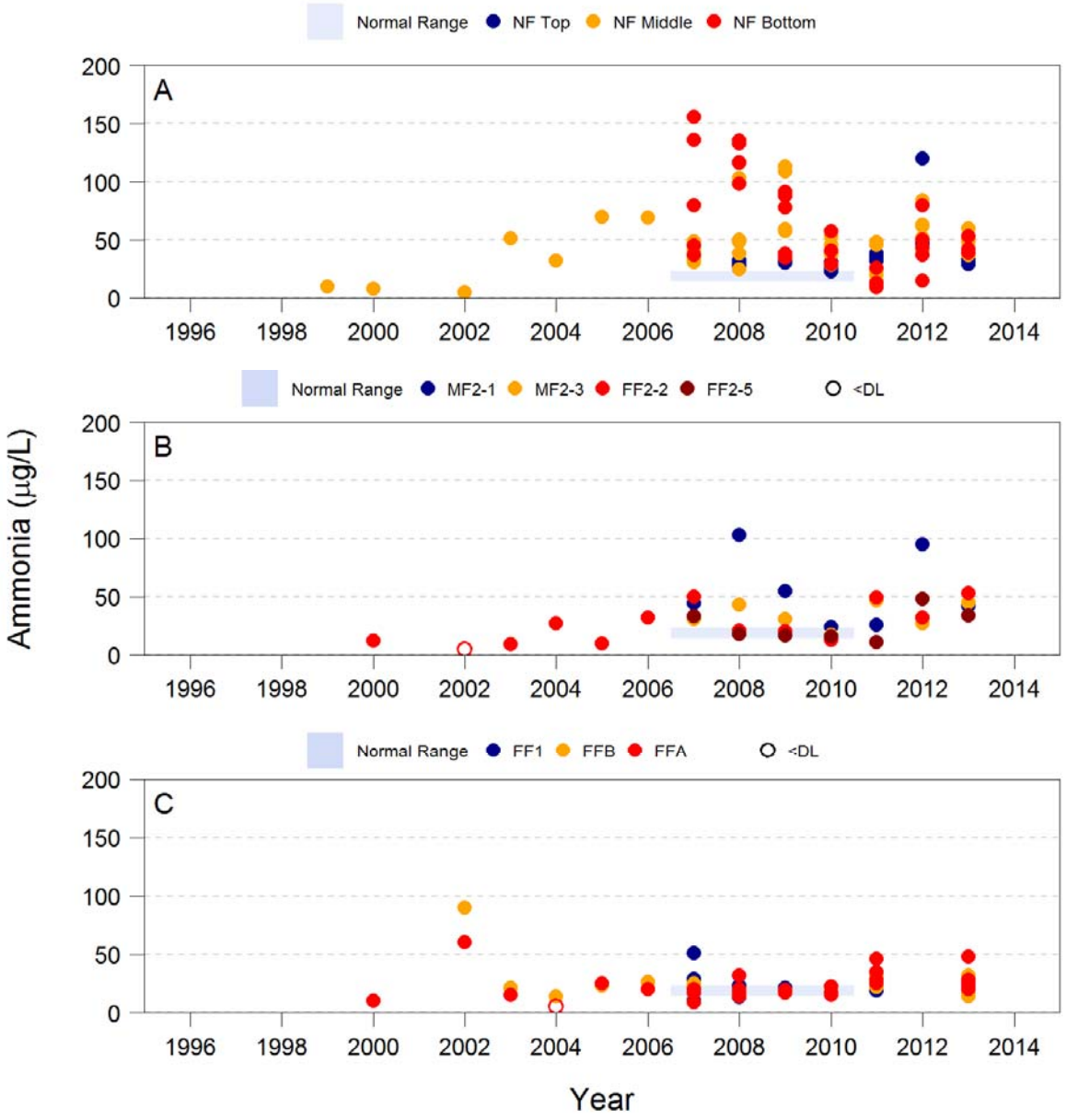
Nutrient addition to the lake, as measured by nitrogen, phosphorous and parts of algae concentrations, continued to show mild enrichment (an increase in nutrients) close to the mine compared to other areas farther from the mine. The small plants and animals that live in the water column (plankton) have 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.

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.

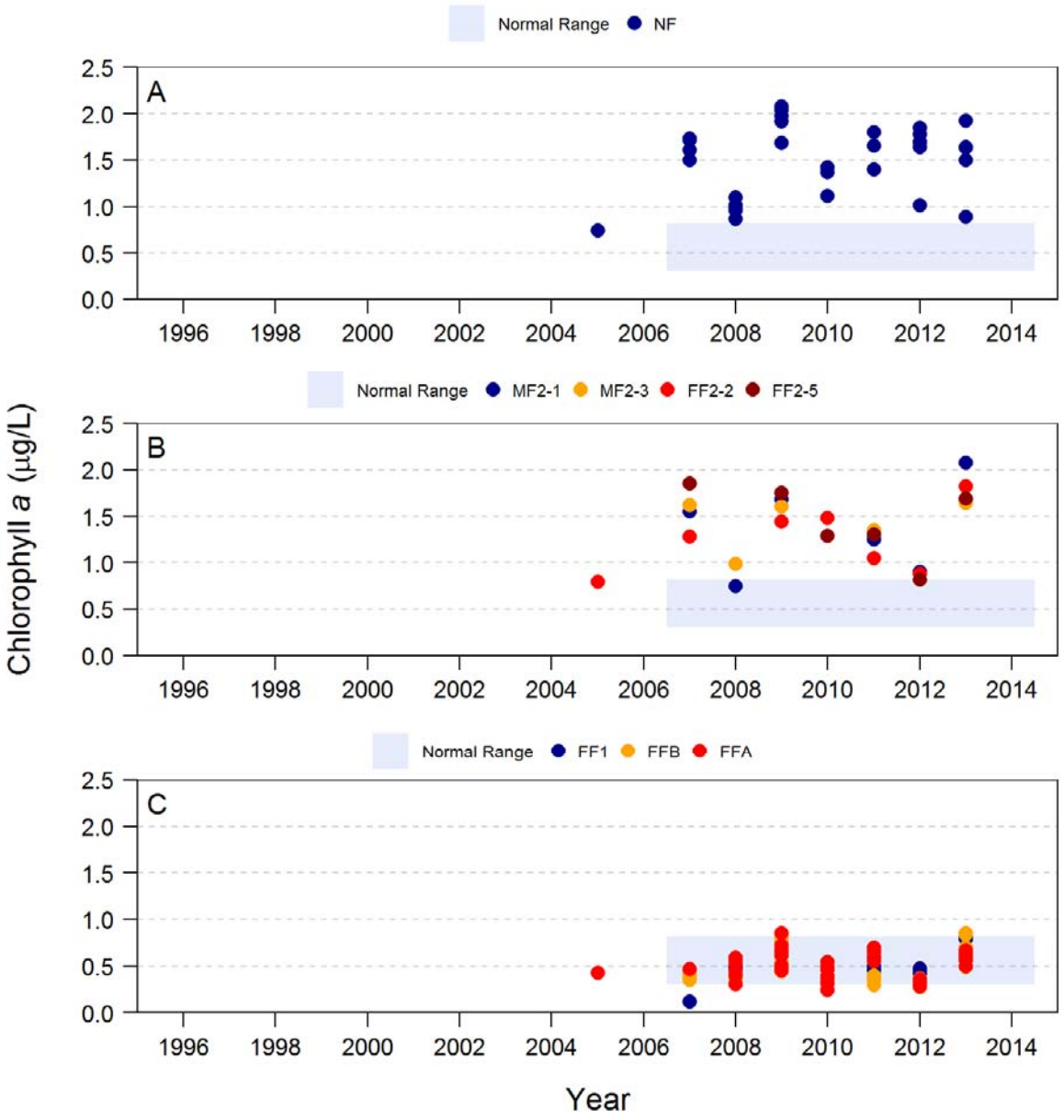
Figure 6 **Ammonia-Nitrogen Concentration (A – close to the mine, B – middle of lake, C – far from mine)**



- 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.

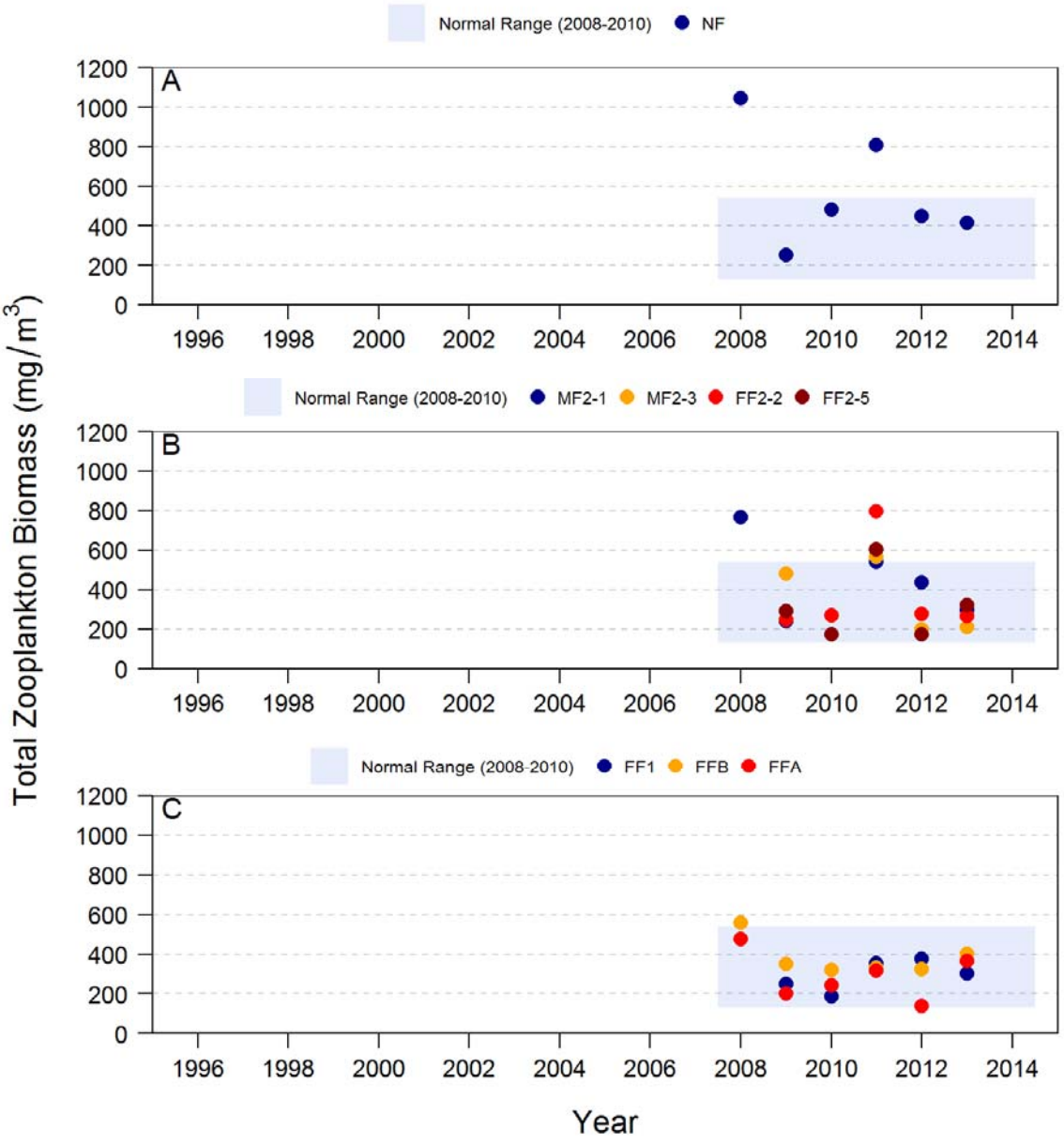
Figure 7 **Amount of Chlorophyll *a* in Open Water (A – close to the mine, B – middle of lake, C – far from mine)**



- 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.

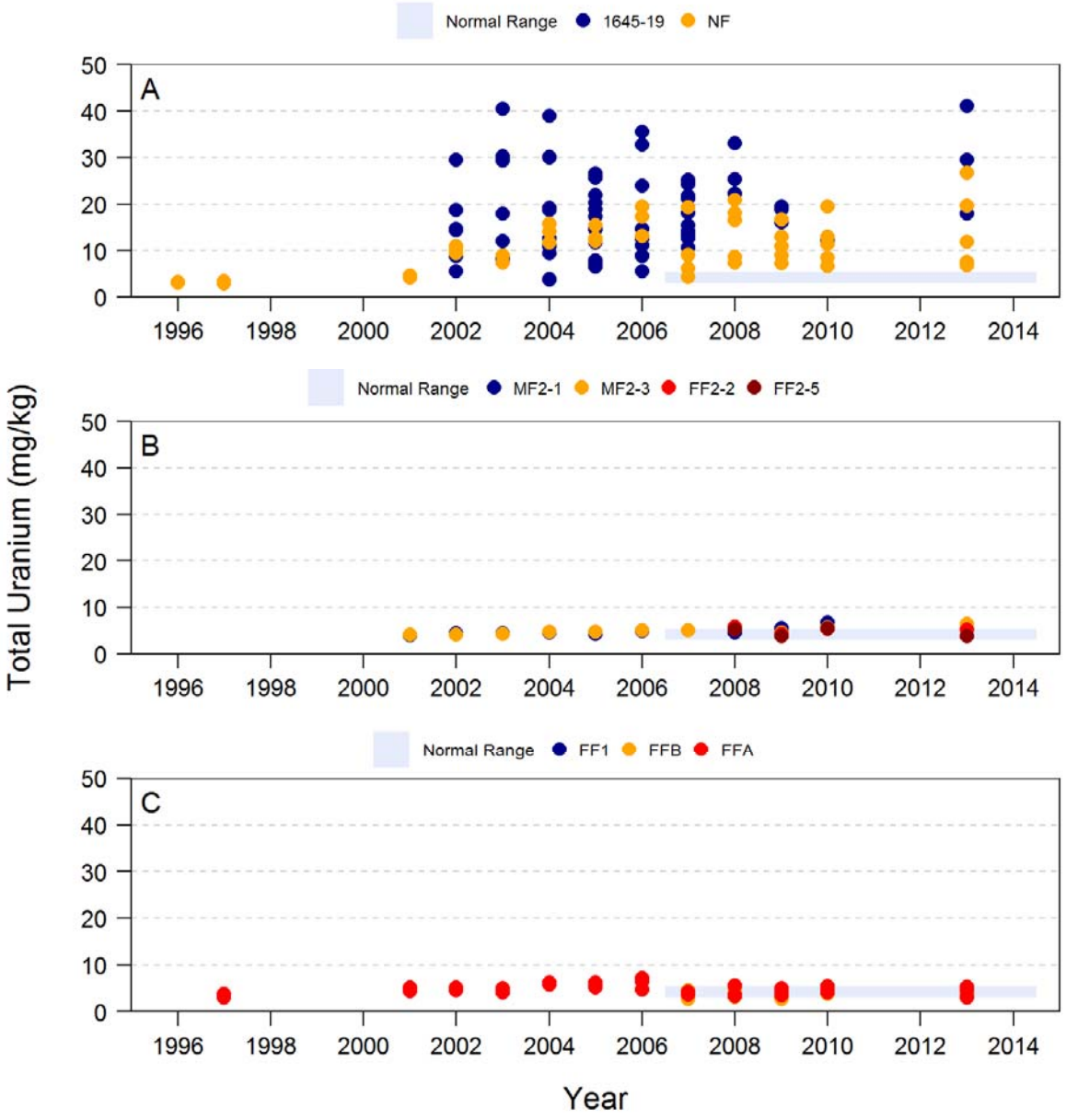
Figure 8 Amount of Zooplankton (A – close to the mine, B – middle of lake, C – far from mine)



- 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.

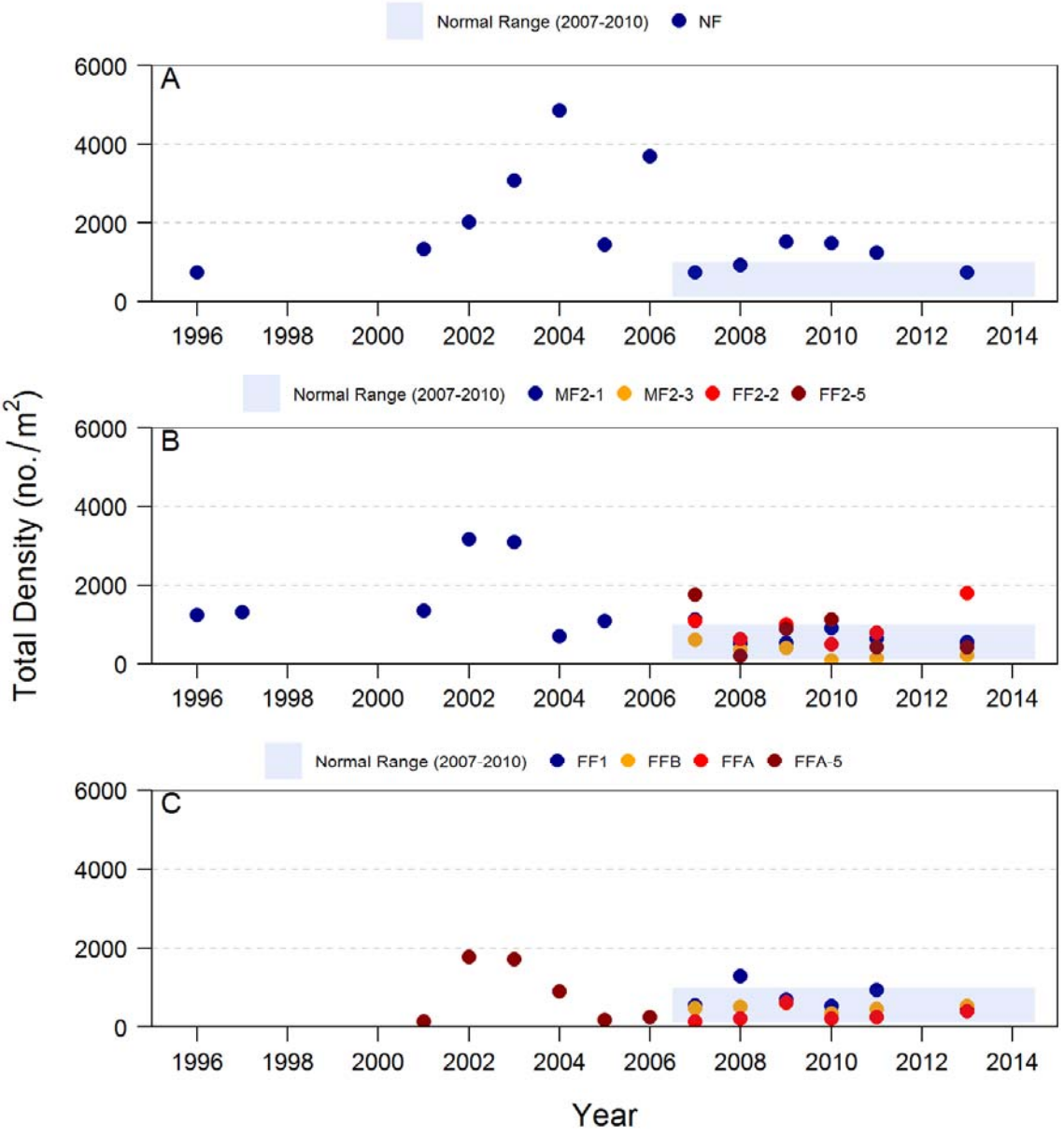
Figure 9 **Amount of Uranium in Sediments (A – close to the mine, B – middle of lake, C – far from mine)**



- 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.

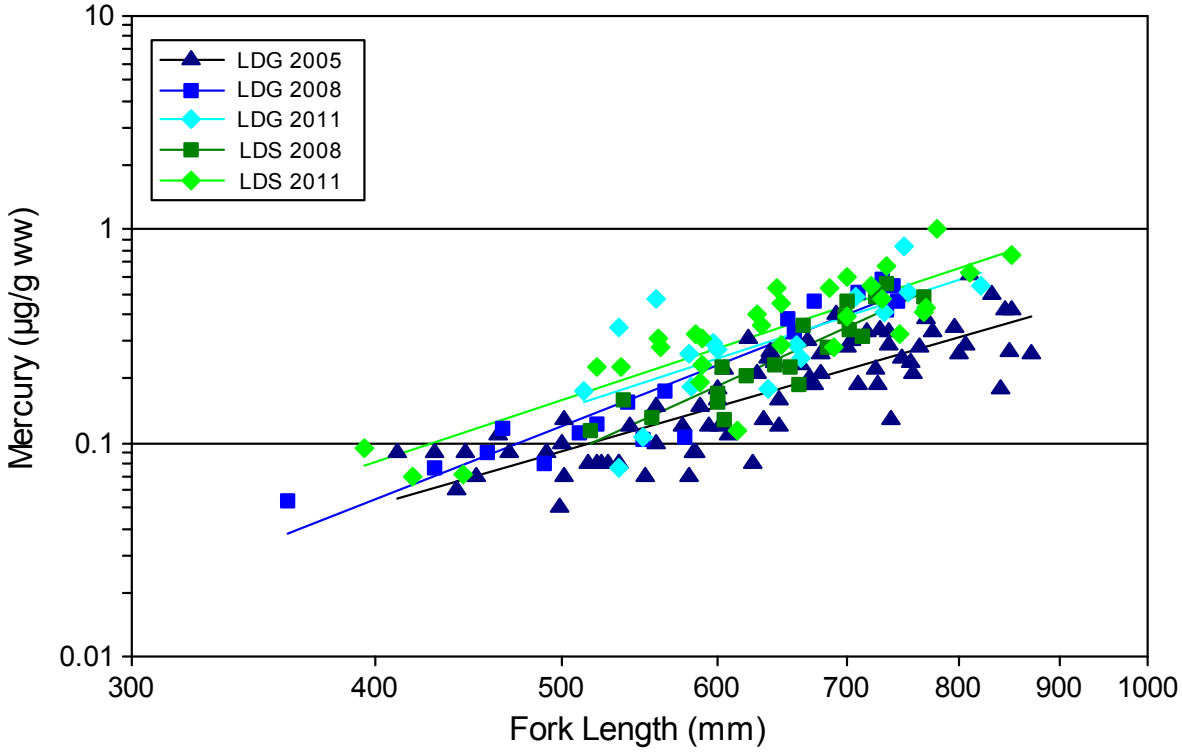
Figure 10 **Number of Benthic Invertebrates (A – close to the mine, B – middle of lake, C – far from mine)**



- 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.

Figure 11 **Linear Regressions of Mercury Concentrations over Fork Length for Lake Trout Collected from Lac de Gras and Lac du Sauvage, 2005 to 2011**

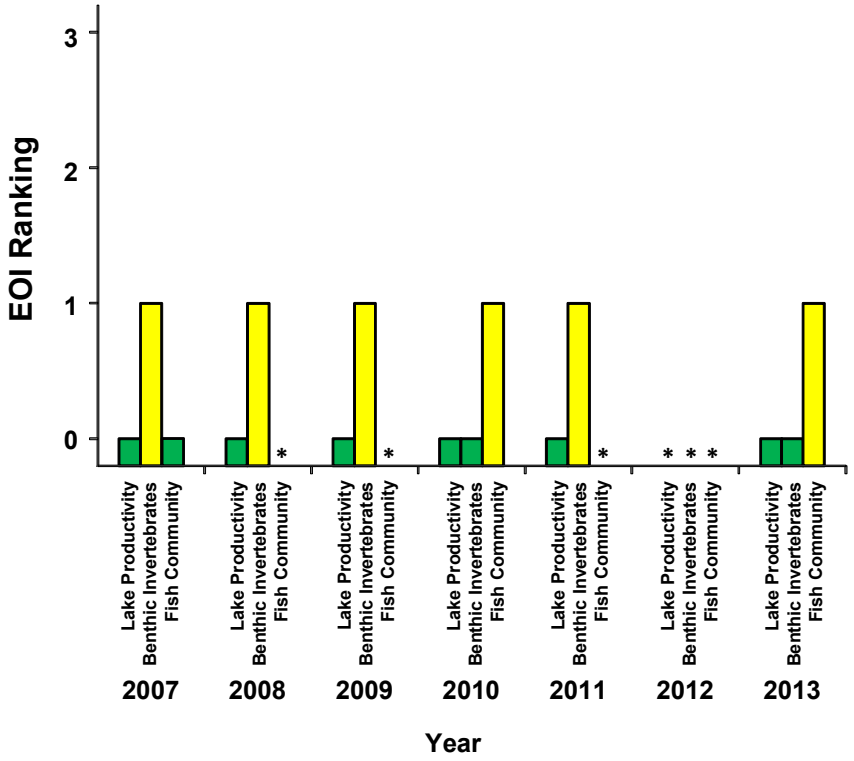


Notes: µg/g = micrograms per gram; mm = millimetre; LDG = Lac de Gras; LDS = Lac du Sauvage. Axes are on a logarithmic scale.

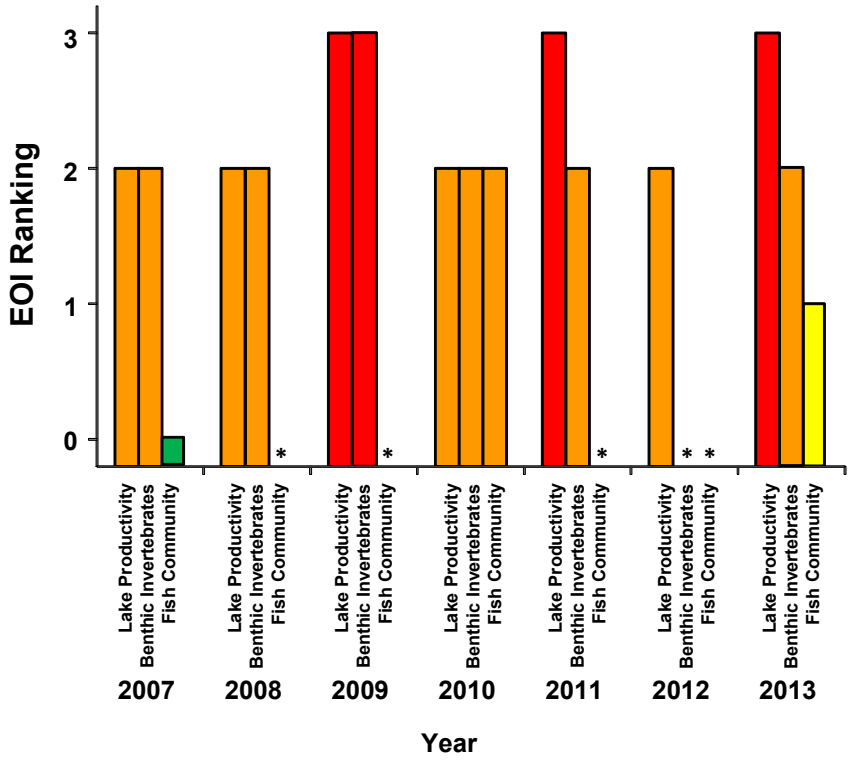
- A weight-of-evidence (refer to Definitions section) uses all of the above information in a qualitative process where professional scientists assess the strength of all the results in determining possible nutrient enrichment or harmful/toxicological impacts from the mine. There was strong evidence for 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.

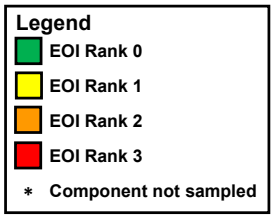
Figure 12 Overall Ranking of Effects

Toxicological Impairment



Nutrient Enrichment





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 (Figure 11).

- 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 4: Weight-of-Evidence Results, 2013 AEMP

Ecosystem Component	EOI Rating
Toxicological Impairment	
Lake Productivity	**0**
Benthic Invertebrates	**0**
Fish Population Health (see below)	**1**
Nutrient Enrichment	
Lake Productivity	**3**
Benthic Invertebrates	**3**
Fish Population Health (see below)	**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:

- On a regional scale the only effect on the fish population of Lac de Gras would be due to angling;
- 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 (500 ug/kg for mercury);
- Mercury concentrations will not increase above the existing average background concentration of 181.5 µg/kg; and,
- Local effects due to blasting, suspended and settled sediment from dike construction, increase in metal concentrations around dikes and post-closure runoff.

Observations:

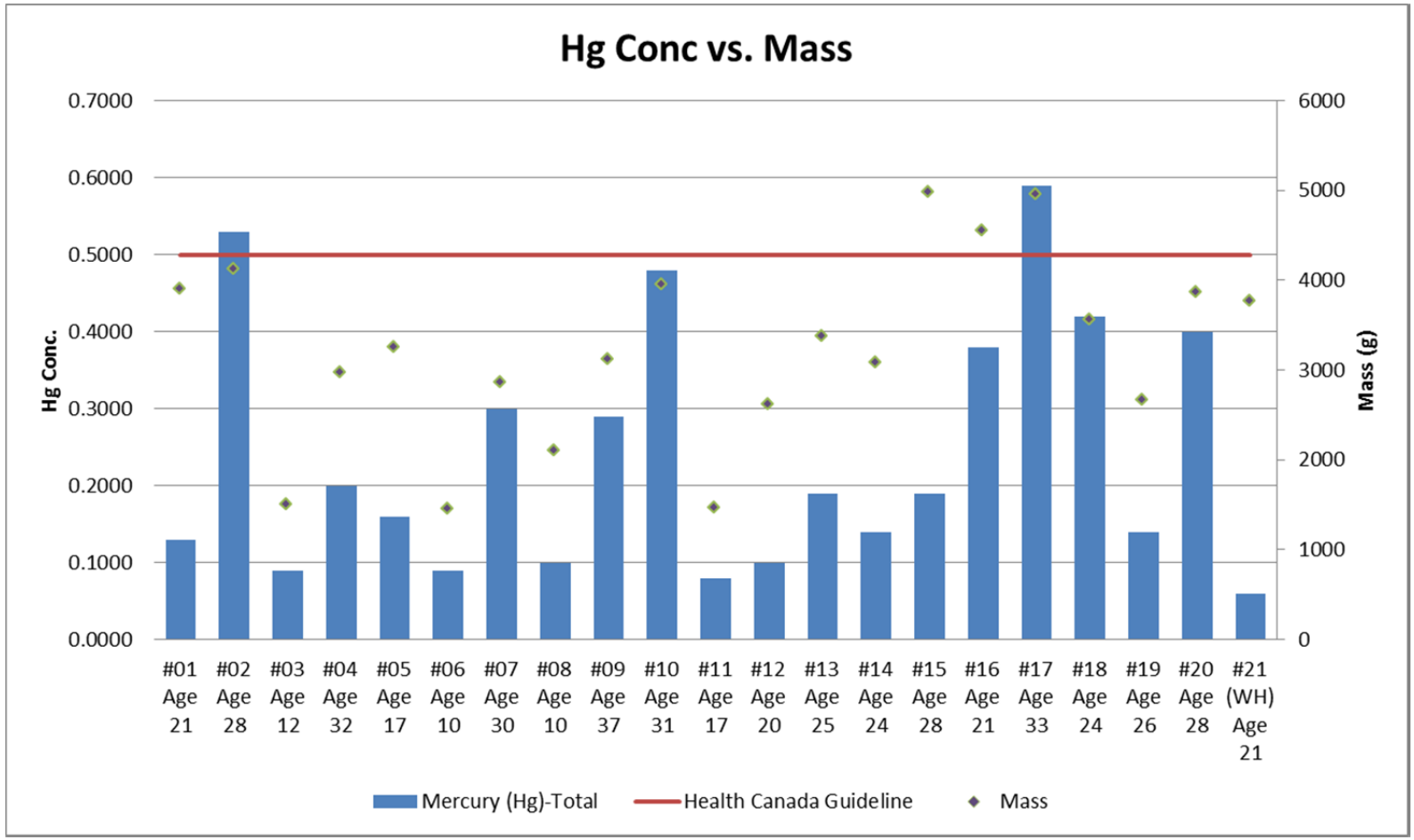
- *AEMP TK Study of Fish Health*
  Overall, participants in the 2015 AEMP Traditional Knowledge (TK) Study commented that the present status of the fish and water in Lac de Gras beside the Diavik mine is good and better than they expected given how close it is to industrial activity. People appreciated experiencing the current state of the environment personally and evaluating both water and fish "with their own eyes". Participants 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.

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 13).

Figure 13 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*
  Fish (slimy sculpin) were healthy, with few irregularities observed in 2016. 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*

  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 between 2014 and 2015. 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.

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

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.

Other observations made in past years 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.

Runoff and Seepage

There are locations where seepage and runoff occur at the Diavik mine site. There were historically 22 seepage 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 the fall of 2013 to include the following stations, as identified in Figure 4:

- 2 freshet surface runoff stations;
- 1 groundwater well;
- 4 seepage collection wells (within the PKC dams); and
- 10 collection ponds.

Seepage is monitored and managed by DDMI staff and the Inspector is kept informed of seepage issues, as well as the short and long term plans for monitoring and repairs. No seepage has been seen downstream of seepage collection areas since 2013, as the upstream water collection 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:

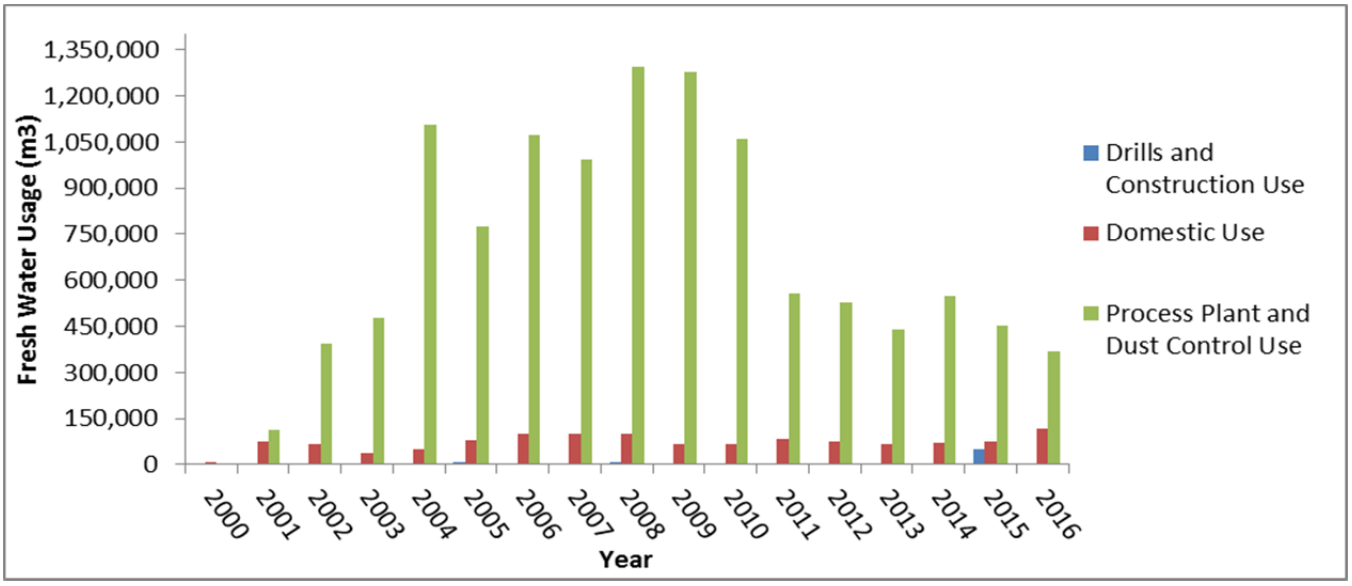
- Water supply to the mine is not limited and use of the resource will not cause changes in water levels and discharges from Lac de Gras beyond the range of natural variability.

Observations:

The figure below shows the purpose and amounts of fresh water used from 2000 to 2016 (Figure 14). Diavik recycles water from the PKC and North Inlet as much as possible in order to reduce the amount of fresh water needed; in 2016, this amounted to 2.5 million m^3 of recycled water. The Water License allows Diavik to use a total of 1.28 million m^3 of Lac de Gras water per year;

Diavik only used 490,684 m^3 in 2016. 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 14 Freshwater Use Volumes from 2000-2016



Climate and Air Quality

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

EA Predictions:

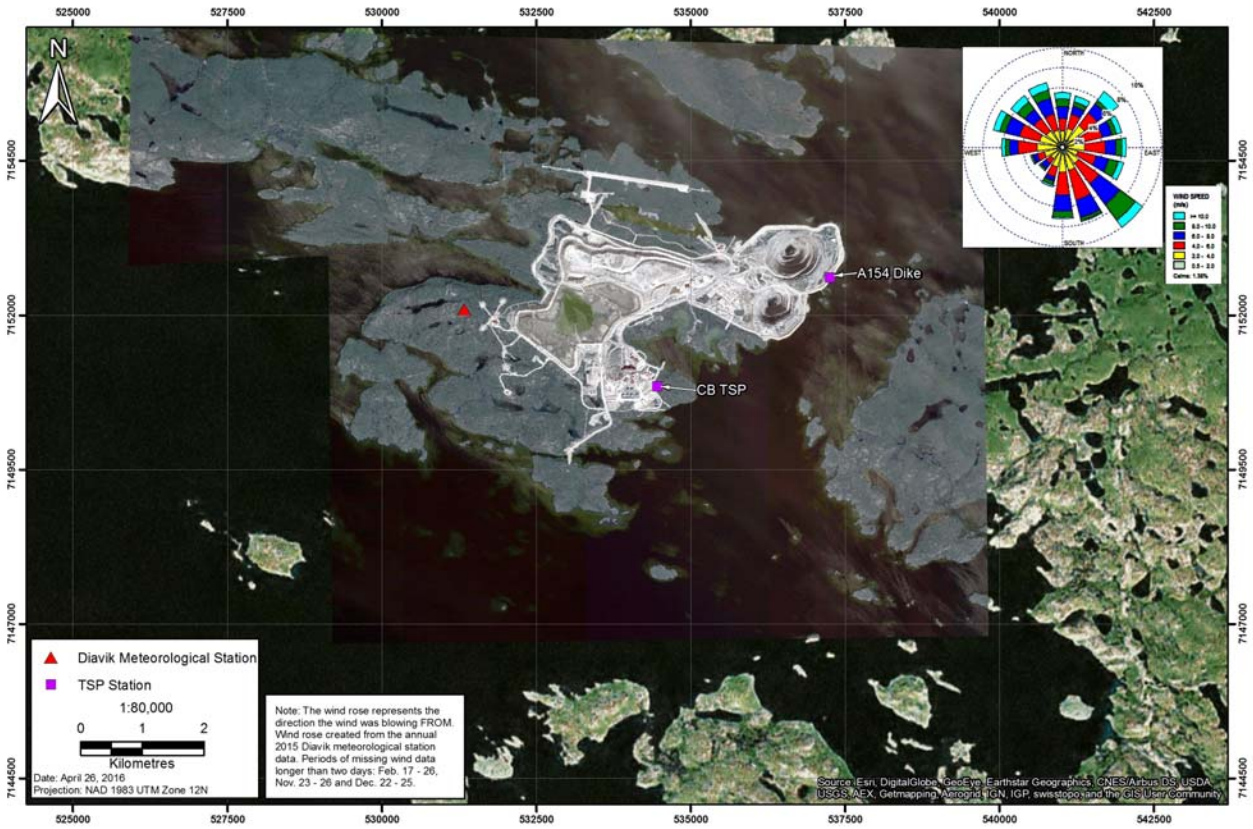
- Ambient air quality objectives will not be exceeded; and
- The mine will be a very minor contributor of greenhouse gases.

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 15).

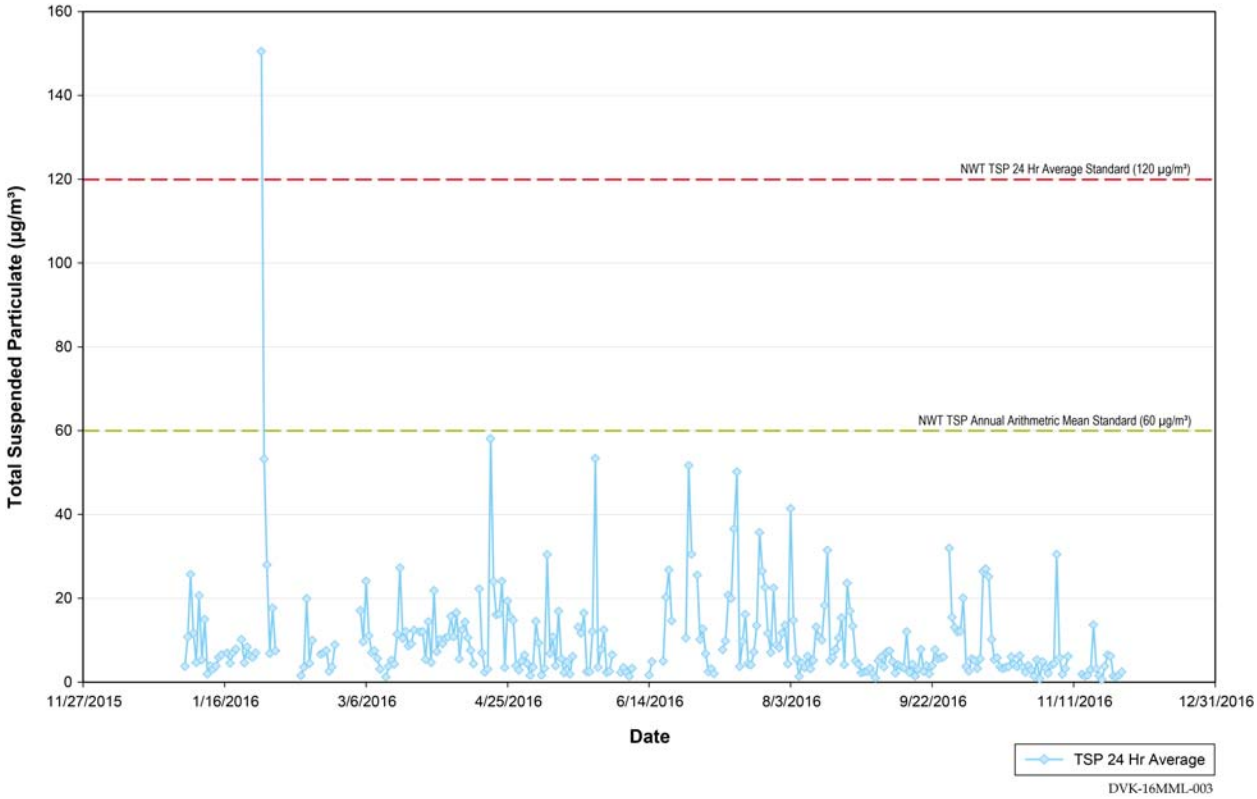
Figure 15 TSP Monitoring Station Locations



During 2016, TSP levels at the communications building remained below the GNWT Department of Environment and Natural Resources (ENR) standard of 60 micrograms per cubic meter (µg/m^3), with only one high reading that was above the 24-hr standard (120 µg/m^3). These results agree with Diavik's prediction that there would be up to two (2) 24-hour exceedances per year. Unfortunately, the TSP monitoring station on the A154 dike was not working for 10 months out of the year, and the data collected during the other two months was not valid so it was excluded from the 2016 report.

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. These results agree with Diavik's prediction that there would be up to two (2) 24-hour exceedances per year.

Figure 16 2016 Annual 24-hr TSP Amounts – Communication Building



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*

  Estimated dustfall rates were compared to the British Columbia Ministry of Environment dustfall objectives for the mining, smelting, and related industries (BC MOE 2016). The dustfall objective ranges from 1.7 to 2.9 milligrams per square decimetre per day (mg/dm2/d), or 621 to 1,059 milligrams per square decimeter per year (mg/dm2/y). While this dustfall objective is no longer used in British Columbia, it is used here to be consistent with prior dust deposition reporting for Diavik and other mines in the region. There are no dustfall standards or objectives for the Northwest Territories. Comparisons of mean and maximum dustfall values suggest that dustfall rates were generally higher in 2016 compared to 2013 to 2015; however, they 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 increase in dust during 2016.

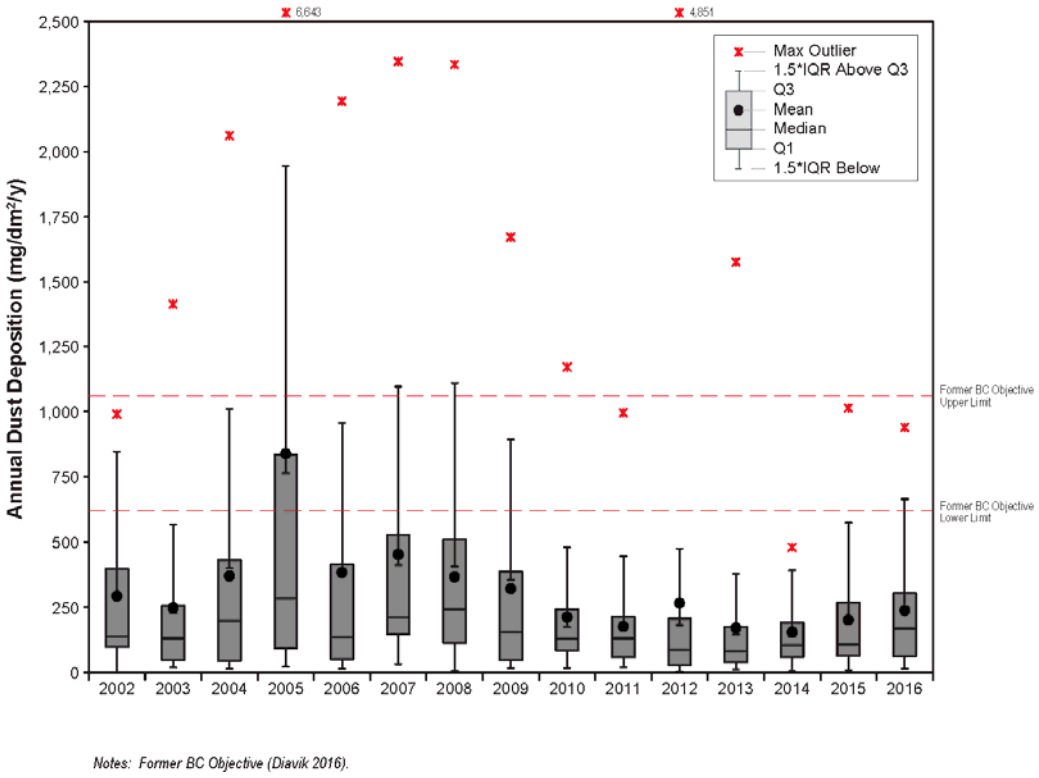
Dust fall levels continued to show a decreasing trend in 2014 and 2015, based on distance from the mine. The lowest dust fall level was recorded at one of the control sites located 5.5 km away from the mine. Values recorded for each of the 12 dust gauges and 27 snow survey stations were below the BC 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 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 (Figure 17).

Figure 17 Annual dust deposition rates compared to BC Objective for Mining - 2002 to 2016



Notes: Former BC Objective (Diavik 2016).

- *Snow Water Chemistry*

  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.

  Measurements of the amount of chemicals in the water from melted snow indicate that the concentrations measured in 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 (Table 5). However, this sample was accidently taken closer to the mine site than it should have been so the ability to compare the results to water license levels is limited.

Table 5: Summary of 2016 Snow Water Chemistry Analysis

Distance from Mine	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Nitrite	Phosphorus	Zinc
Water License Limit	3.0 mg/L	0.1 mg/L	0.003 mg/L	0.04 mg/L	0.04 mg/L	0.02 mg/L	0.1 mg/L	2.0 mg/L	n/a	0.02 mg/L
0-100 m	2.7	0.0004	0.000036	0.020	0.005	0.0031	0.127	0.00554	0.100	0.019
101-250 m	0.192	0.0008	0.000003	0.0013	0.0003	0.0003	0.0022	0.0020	0.012	0.0022
	1.390	0.0017	0.000004	0.0093	0.0043	0.0016	0.0017	0.0036	0.064	0.010
251-1000 m	0.200	0.00007	0.000002	0.001	0.00029	0.00024	0.0015	0.0020	0.0094	0.0020
	0.173	0.00005	0.000002	0.0012	0.00033	0.00021	0.0014	0.0021	0.0082	0.0021
	1.590	0.00022	0.000018	0.010	0.0026	0.0016	0.018	0.0067	0.057	0.010
	2.260	0.00031	0.000031	0.016	0.0055	0.0030	0.031	0.0083	0.109	0.015
1001-2500 m	0.387	0.00047	0.000003	0.0018	0.00042	0.00039	0.0022	0.0029	0.013	0.0031
	0.123	0.00007	0.000003	0.00076	0.00024	0.00020	0.0010	0.0020	0.0074	0.0019
	0.118	0.00005	0.000003	0.00079	0.00032	0.00014	0.00092	0.0020	0.0074	0.0020
	1.620	0.00019	0.000019	0.0117	0.0029	0.0017	0.0209	0.0040	0.049	0.012
	0.632	0.00013	0.000005	0.0038	0.0013	0.00072	0.0064	0.0028	0.028	0.0047
	0.650	0.00013	0.000006	0.0030	0.0014	0.00068	0.0040	0.0020	0.031	0.0049
	0.256	0.00014	0.000003	0.0018	0.00036	0.00026	0.0024	0.0020	0.0055	0.0022
	0.031	0.00001	0.000003	0.00079	0.00009	0.00008	0.00061	0.0020	0.011	0.0013
>2500 m (Control)	0.085	0.000023	0.000003	0.00046	0.000083	0.00011	0.00072	0.0020	0.0076	0.0014
	0.413	0.000086	0.000003	0.0026	0.00068	0.00040	0.0039	0.0020	0.015	0.0034
	0.245	0.000048	0.000003	0.0016	0.00046	0.00031	0.0024	0.0020	0.0096	0.0023

- *Greenhouse Gas Emissions*

  Total greenhouse gas emissions for Diavik in 2016 were 191,632 tonnes of CO_2e, an increase from last year 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 carbon dioxide emissions by 9,030 tonnes in 2016.

Vegetation and Terrain

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

EA Predictions:

- Approximately 12.67 km^2 of vegetation/land cover will be lost at full development; and
- Slow recovery of vegetation following mine closure.

Observations:

- There was a very slight increase in direct vegetation/habitat loss in 2016 due to mine development. Total habitat loss to date from mining activities is 11.22 km^2. This is within the predicted amount of 12.67 km^2. The table below shows a running total of the habitat loss to date.

Table 6: Cumulative Habitat Loss Each Year

Predicted Vegetation Habitat Loss (km^2)	Up to 2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
12.67	3.12	5.88	6.32	7.30	8.15	8.86	9.40	9.66	9.78	9.65	9.71	10.1	10.12	10.15	10.55	11.22

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

EA Prediction:

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

Observations:

- *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. Figure 18 shows the PVP locations.

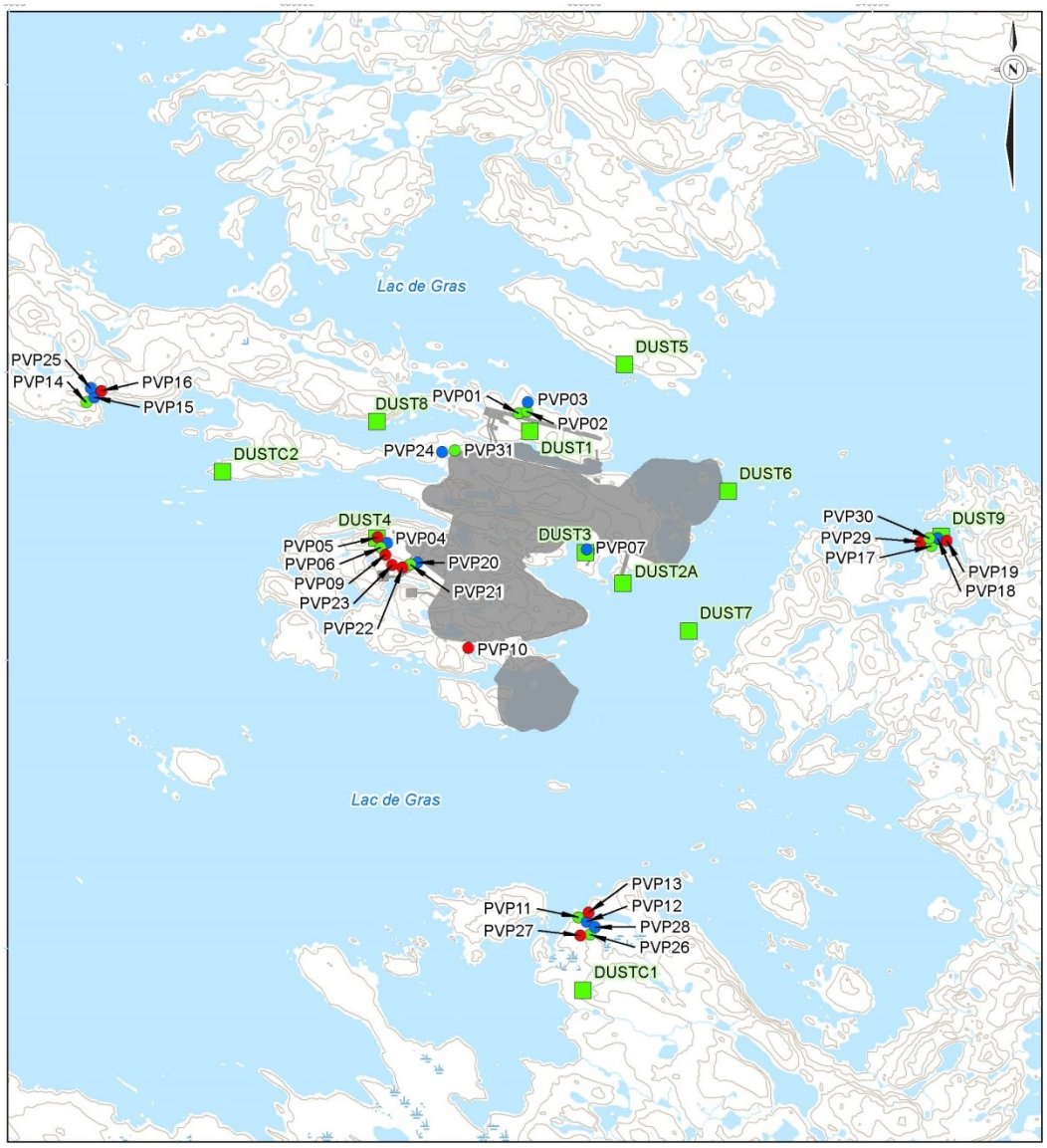
  PVPs were sampled in 2016. The results of the analysis of dust deposition and vegetation data show differences in the amount and types of plant species in mine and reference plots (natural tundra at a far distance from the mine) over time that are likely due to Mine-related effects, such as dust deposition. 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 should be 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.

Figure 18 2016 Permanent Vegetation Plots



LEGEND

- WATERCOURSE
- WATERBODY
- DUSTFALL COLLECTOR
- VEGETATION SAMPLE PLOT
  - HEATH TUNDRA
  - SHRUB
  - TUSSOCK-HUMMOCK
- DIAVIK FOOTPRINT

2 0 2

SCALE 1:100,000 KILOMETRES

PROJECT

DIAVIK DIAMOND MINES INC.

TITLE

PERMANENT VEGETATION PLOT AND DUST COLLECTOR SAMPLING LOCATIONS

- *Lichen*

  A lichen study was conducted in 2016 (every three years) to determine the amount of metals in lichen from dust deposition closer to and further away from the mine. 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, as noted on Figure 19. 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, it is recommended that the sampling frequency for this study be reduced to once every 5 years to coincide with the suggested change in the vegetation monitoring program.

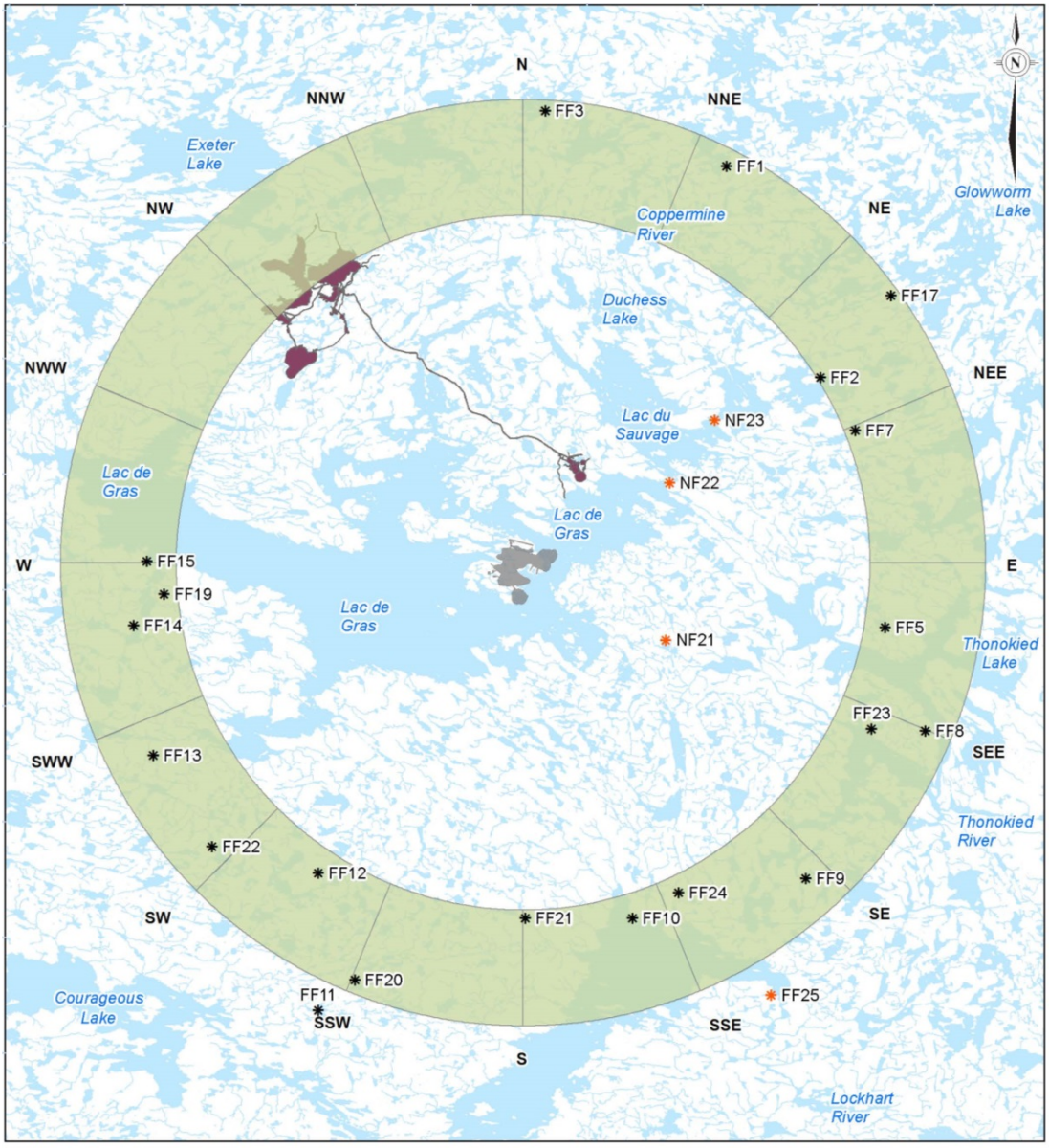
  The 2013 sampling program had a scientific component focusing on metal levels in lichen and soil, as well as a TK component focused on assessing the type of landscapes caribou prefer for forage, use and migration, and to assess lichen conditions at various sample sites to see how dust from the mine potentially 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 to date is planned to be completed at the end of 2017.

Figure 19 **2016 Lichen Monitoring Sites**



LEGEND

- WATERCOURSE
- WATERBODY
- HISTORIC LICHEN SAMPLING LOCATION
- NEW 2013 LICHEN SAMPLING LOCATION
- EKATI FOOTPRINT
- DIAVIK FOOTPRINT
- 30-40 Km ORDINAL BUFFER

10 0 10

SCALE 1:500,000 KILOMETRES

PROJECT

DIAVIK DIAMOND MINES INC.

TITLE

FAR-FIELD AREA LICHEN AND SOIL SAMPLING LOCATIONS AND NEW SAMPLING LOCATIONS

Wildlife

Caribou

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

EA Predictions:

- 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);
- The zone of influence (ZOI) from project-related activities would be within 3 to 7 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
- Project-related mortality is expected to be low.

Observations:

- *Habitat*

  There was a minor loss of direct summer habitat in 2016 due to mine footprint expansion during A21 construction. The amount of HUs lost in 2016 was of 0.059, bringing the total loss to date to 2.788 HUs (see table below). This is less than the amount that was predicted.

Table 7: Caribou Habitat Loss by Year

Predicted Caribou Habitat Loss (HUs)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013-2014	2015	2016	Loss to Date
2.97	0.39	0.59	0.28	0.15	0.32	0.23	0.15	0.18	0.13	0.04	0.00	0.02	0.13	0.00	0.13	0.06	**2.8**

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.

- *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. This ZOI prediction is largely supported by stakeholders. While it is double the size of the original prediction, it does not appear to be directly related to the level of activity at the mine site. It is not known what kind of

influence large lakes like Lac de Gras have on the distribution of caribou, but it is likely a contributing factor to the ZOI.

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), and re-analysis of the data is not expected to result in different information about the animals or their habitat use. Aerial surveys continue to be suspended in favour of other studies that support the GNWT Barrenground Caribou Management Strategy and Bathurst Caribou Range Plan. The GNWT (Environment and Natural Resources, ENR) has been leading a working group to determine the best approach(es) to ZOI monitoring and DDMI will consider the recommendations developed as a part of this process. 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/km^2) is within the mine-related and natural levels of change seen in the study area from 1998 to 2012.

The caribou movement 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.

- *Behavioural Observations*

  The goal of the program is to generate enough observations to test possible impacts to caribou based on how they behave closer to and further from the mines. In past years, Diavik has had community Elders and youth participate in this work and contribute their input and knowledge to the program results. Few caribou were observed in the study area in 2016, so the number of behavioural observations/scans conducted was a total of 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. Diavik works with EKATI mine to collect and share data that covers distances from less than 2 km to greater than 30 km from mine infrastructure.

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*

  Data from satellite-collared caribou show that during 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 (Figure 20a). 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 (Figure 20b). 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. Past analysis showed that from 2002 to 2014, with the exception of 2006, caribou movement patterns agreed with the EER prediction that the majority of collared caribou would travel beside or through the southeast corner of the study area during the southern migration. A TK study conducted through the Tłı̨chǫ Training Institute in 2013 developed a map (Figure 21) 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 aligned with the EER prediction as well, showing that caribou continue to move east of Lac de Gras during the northern migration and west of the lake during the southern migration, but noting that they ultimately return to the same general areas for calving and overwintering.

Figure 20a 2016 Northern Migration of Caribou

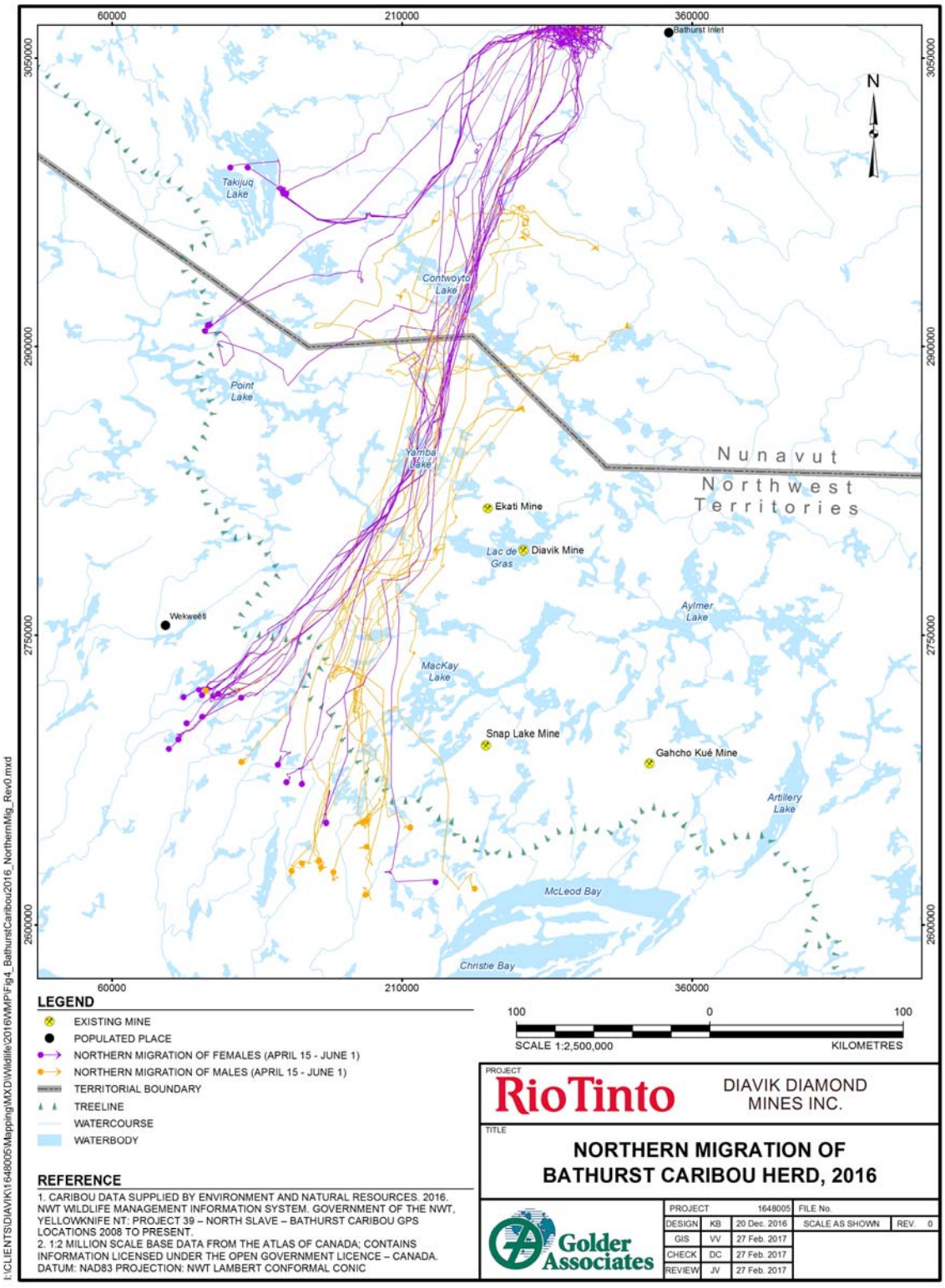


Figure 20b 2016 Southern Migration of Caribou

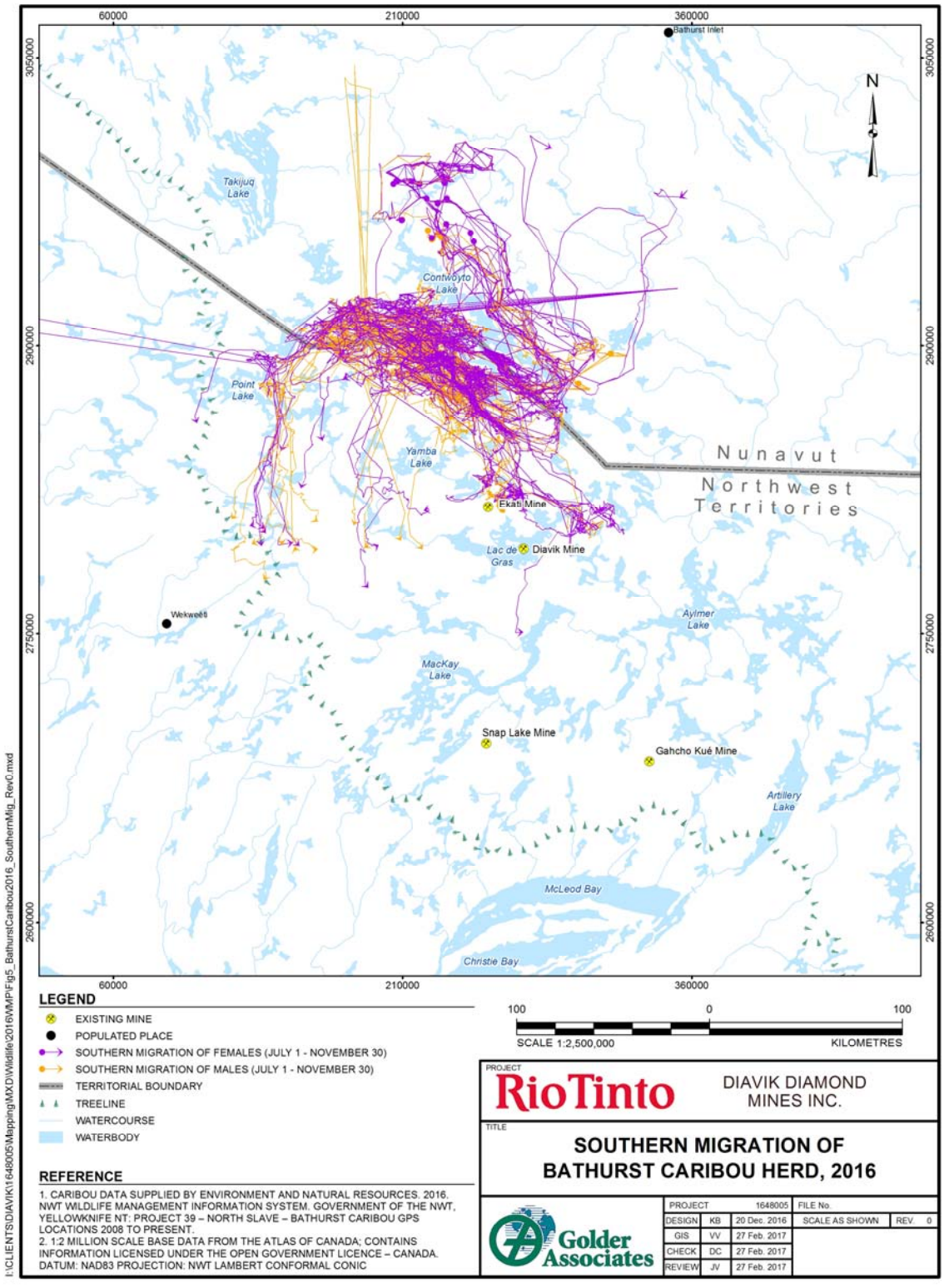
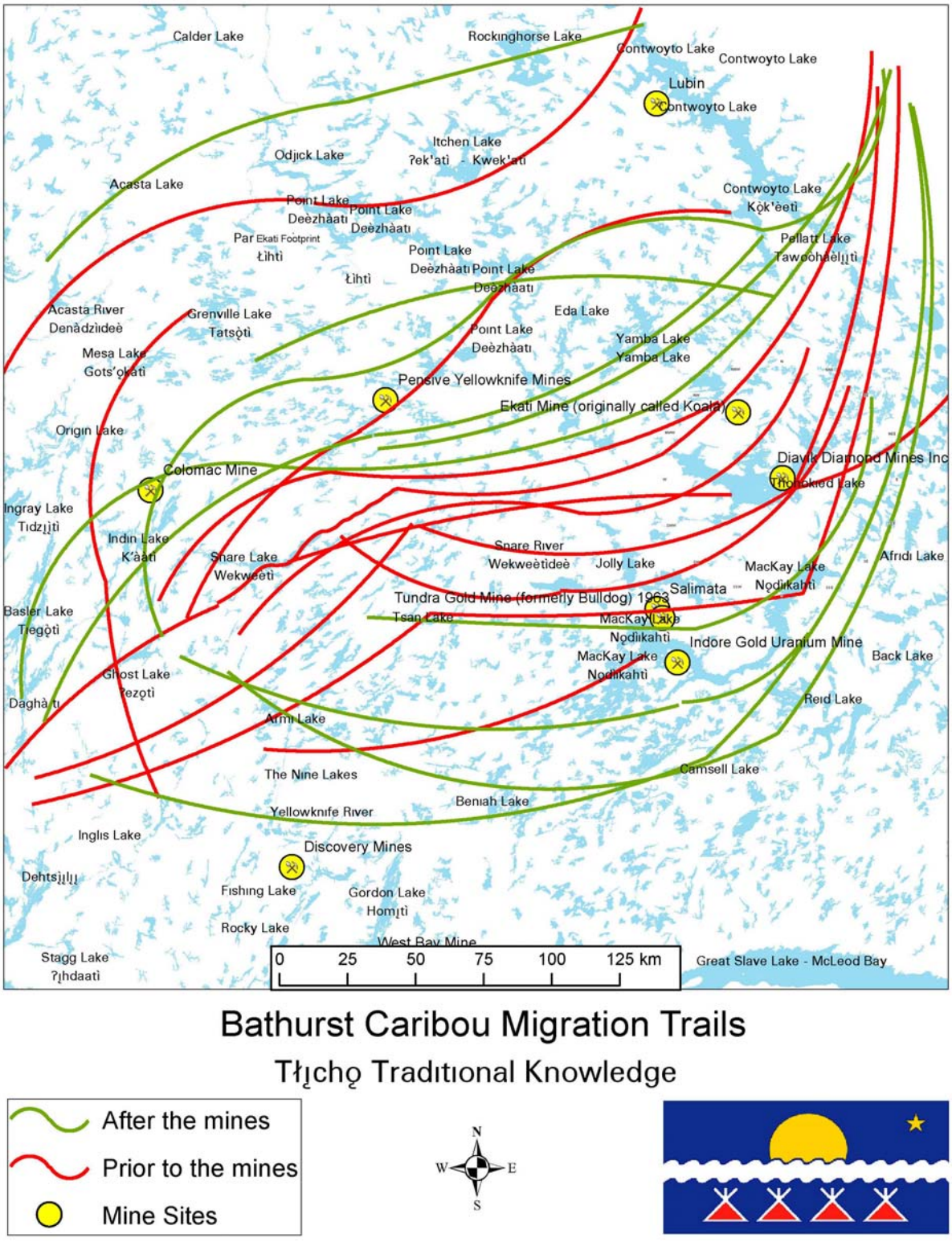


Figure 21 Caribou Migration Trails Prior to and After the Mines (Tłı̨chǫ Training Institute)



- *Herding & Mortality*

  There were two incidents involving caribou at the Mine site in 2016. 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 2016. There has been only one caribou mortality caused by mining activities (2004) since baseline data began being collected in 1995.

Grizzly Bear

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

EA Predictions:

- Approximately 8.7 km^2 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;
- The maximum zone of influence from mining activities is predicted to be 10 km; and,
- Bear mortalities due to mine related activities are expected to average 0.12 to 0.24 bears per year over the mine life.

Observations:

- *Habitat*

  The table below shows the grizzly bear habitat that has been lost to date (in square kilometers), which falls within what was predicted.

Table 8: Grizzly Bear Habitat Loss by Year

Predicted Grizzly Habitat Loss (km^2)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009 to 2014**	**2015**	**2016**	**Loss to Date**
8.67	1.25	1.62	0.94	0.42	0.93	0.69	0.43	0.50	0.26	0.64	**0.35**	**0.17**	**8.13**

- *Mortality*

  The calculated mine mortality rate for grizzlies over the past seventeen years (since 2000) is 0.06, which is below the range predicted. One mortality occurred at the mine in 2004.

- *ZOI and Abundance/Distribution*

  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.

  A new study design was developed to study grizzly bears in the Diavik and EKATI mine areas 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 2012 and 2013, for the Diavik and EKATI mines, and De Beers completed it in 2013 and 2014. The number of posts with grizzly bear hair varied throughout the 6 sampling sessions each year. In 2012, it ranged from 20% to 44% of posts, while in 2013 it was between 46% to 57%. Methods and timing of future monitoring for this program are yet to be determined.

  There were a total of 94 grizzly bear visits during 2016. 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 9).

Table 9: Average Camp Population and Number of Incidental Grizzly Bear Observations, 2002-2016

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

Wolverine

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

EA Predictions:

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

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

Observations:

- Wolverines were observed on East Island 105 times during 2016. These observations are not recorded systematically and contain repeat sightings of the same animal. 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 10). The wolverine relocations happened on 6 March and 15 March. Relocation permits were obtained from ENR as a result of repeated observations of wolverine on site and, once trapped, the wolverines were relocated to MacKay Lake. There were four incidents of wolverine trapped in large waste bins in April, and three of these incidents occurred five days apart. The wolverines were able to escape once a plank was put into the bin. The fourth incident involved finding a dead wolverine in an empty waste bin in June. Site personnel were preparing to move a bin when a foul smell was noticed and the Environment department was notified. The wolverine carcass was removed and it was estimated that it had been in there for several months. ENR was notified and determined that the carcass was not salvageable and should be incinerated. Resulting from this incident, the Environment department re-educated staff on the importance of properly segregated waste and reminded them that all unused waste bins should be cleaned out and securely closed to prevent animals from becoming trapped. See Table 10 for historic visitations, relocations and mortalities.

Table 10: Wolverine Observations, Relocations and Mortalities, Baseline to 2016

	Baseline[(a)]	2000-2004	2001	2002-2007	2008	2009-2011	2012	2013	2014	2015	2016
Days with Visits	27/year Total = 82	25	36	149	46	53	11	3	6	118	105
Relocations	1	0	2	0	0	0	0	0	0	1	2
Mortalities	1	0	1	0	1	0	2	0	0	0	1

(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 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 total of 100 tracks were found over two transect surveys from 22 March to 13 April 2016, with an average track density of 1.25 (per kilometer) for all transects. Over the years the number of tracks identified remained relatively consistent from 2003 to 2009, and detection rates have increased since 2011. Future programs that include successful survey of all transects twice will help identify whether snow track detection rates vary through time.

Table 11: Wolverine Track Index, 2003-2016

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 – April 17	38	160	0.13
2016	March 22 – April 13	50	160	1.25

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. A total of 66 individuals (34 males, 32 females) were identified in the Diavik area in 5 years of the program. Seven of the wolverine identified in 2014 had been previously detected in the Diavik area. Interestingly, two individuals identified in the Diavik area in this year were also seen in the Snap Lake study area. A declining trend in the number of wolverine in the Diavik study area has been seen with the DNA hair-snagging study, and is likely influenced by the number of caribou in the Bathurst herd. 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 will be determined after the 2014 data summary analysis report from ENR is complete and reviewed.

Raptors

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

EA Predictions:

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

Observations:

- Diavik, Ekati and the GNWT conducted falcon productivity and occupancy surveys annually in the Daring Lake, Diavik and Ekati study areas from 2000-2010. 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). This survey is conducted across Canada (and North American) every five years. The survey was conducted in 2015.

- 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 12: 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

Year	Survey Area	Total Sites	Occupied	Productive	Total Young
	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
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

- Since May 2005, peregrine falcons have been seen nesting on Diavik buildings and pit walls. A total of 29 pit wall/mine building inspections were carried out in 2016, with 2 active nests found (1 with peregrine falcons, 1 common raven). Similarly, two nests for these same species were found in 2015. 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.

Table 13: Nests Observed on Mine Infrastructure and Open Pits in 2016

Area	Species	Date	Active Nest	Observations
Site Services Building	Peregrine Falcon	10 May	Yes	Three fledglings observed on 9 July and fledged on 8 August.
Boiler House	Common Raven	10 May	Yes	Pair of ravens using old nest. Four fledglings observed in nest on 4 July and had left the nest by 26 June. No longer monitored after 27 July.
A154 Lookout #2	Unknown	21 June	No	Observed perched on an old nest, but no nesting activity was reported.
A154 Lookout #2	Unknown	26 June	No	Observed perched on an old nest, but no nesting activity was reported.

- There was one peregrine falcon found dead at the Mine in 2016. 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.

Waterfowl

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

EA Predictions:

- At full development, 3.94 km^2 of aquatic habitat will be lost; and
- The mine is not predicted to cause a measurable change in waterfowl presence in the study area.
- Early open water or early vegetation growth might attract waterfowl during spring migration.

Observations:

- By the end of 2007, a total of 2.56 km^2 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 km^2 of additional water habitat was lost; 0.06 km^2 of shallow water and 0.17 km^2 of deep water. With continued A21 construction in 2016, a further 0.03 km^2 of shallow water and 0.47 km^2 of deep water habitat were lost. The total area of water habitat loss still remains below predictions (3.94 km^2) at 3.03 km^2.
- 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.

- Excluding raptors, no birds have been killed at the mine site from 2011 to 2016. Four other project-related bird mortalities have occurred, one each in 2010, 2009, 2005 and 2002.

5. 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 PA organizations. The following table summarizes completed engagements relating to the environment that Diavik conducted in partnership with the Participation Agreement (PA) organizations during 2016 (Table 14).

One of Diavik's most important engagement topics during 2016 was the final closure plan for the waste rock pile. Table 14 includes a list of the meetings on this. A summary of the issues each community noted, in addition to Diavik's response, is included in the Final Closure Plan – Waste Rock Storage Area/North Country Rock Pile (Version 1.1). In general, many of the community's comments relating to environmental considerations for closing the pile echoed those of TK Panel participants and included things such as safe caribou access and pathways, re-vegetation plans and protecting the water and fish. These are described in the next section of this report.

Where possible, Diavik tries to include community members in environmental monitoring programs and Mary Black from the Yellowknives Dene First Nation assisted with both wolverine track surveys during 2016. Community members also assisted with the vegetation plot surveys and lichen sampling program during 2016.

Table 14: Community Engagement during 2016

Organization	Methods	Dates	Topics
All 5 PA Organizations	TK Panel	2016-05-12 to 2016-05-16	TK Panel session: post-closure caribou management & monitoring
North Slave Métis Alliance (NSMA)			
NSMA President & Land/Environment Manger	Email	2016-11-04	DDMI request for support of NCRP closure design
NSMA President	Email Email Email	2016-04-04 2016-05-27 2016-10-29	Annual Sustainable Development report Water license amendment, letter to ENR Minister for WLWB Request to review & provide comments on Engagement Plan v2.0
NSMA President & Board	Meeting	2016-09-16	Environment & closure update
NSMA Regulatory Analyst	Meeting	2017-01-30	Land Use Permit renewal presentation
Tłı̨chǫ Government (TG)			
TG Implementation Committee	Meeting Letter	2016-03-15 2016-05-27	TK Panel update Water license amendment-Minister ENR letter
TG Kwe Beh Working Group	Meeting Meeting Meeting	2016-04-26 2016-11-18 2017-01-19	Environment & closure update and WLWB letter Environment & closure plan presentation Land Use Permit renewal
TG – Grand Chief	Email Email	2016-10-29 2016-11-04	Request to review & provide comments on Engagement Plan v2.0 DDMI request for support of NCRP closure design
TG – Chiefs & Chief Executive Committee	Email	2016-04-04	Annual Sustainable Development report
TG Chiefs & Kwe Beh WG, Liaison	Site visit/meeting	2016-08-29	A21 meeting and tour, environment & closure presentation, business update
TG Liaison	Workshop	2017-02-21 to 2017-02-23	Workshop with Liaison and contractors, environment update
Kitikmeot Inuit Association (KIA)			
KIA Leadership	Email Email Email Email	2016-04-04 2016-05-12 2016-10-29 2016-11-04	Sustainable Development report EMAB board appointee Request to review & provide comments on Engagement Plan v2.0 DDMI request to support NCRP closure design
KIA & Kitikmeot Corp.	Meeting	2016-09-20 2016-09-21	A21 project update Environment & closure update
Kugluktuk – Hamlet, KIA, HTO	Meeting Meeting	2016-10-13 2016-10-13	Fish habitat compensation project - final report & presentation. Closure plan and engagement plan
Mayor of Kugluktuk	Meeting	2016-10-13	Closure plan and engagement plan
Lands Environment & Resources	Conference call	2016-01-30	Land Use Permit renewal
KIA Liaison	Workshop	2016-02-21 to 2016-02-23	Diavik overview, workshop with liaison and contractors, environment update

Organization	Methods	Dates	Topics
Łutsel K'e Dene First Nation (LKDFN)			
LKDFN Chief/ Council/L&W Committee	Meeting Email Email	2016-09-15 2016-10-29 2016-11-04	Environment & closure update Request to review & provide comments on Engagement Plan v2.0 DDMI request to support NCRP closure design
LKDFN Chief & Council/Staff	Email Email Email Email Site visit	2016-04-04 2016-05-27 2016-05-27 2016-08-03 2016-10-19	Sustainable Development report (electronic & hard copy) Copy of letter to Minister ENR Response to letter to Minister Request for meeting for Environment & closure plan Site visit & tour, including A21 update
LKDFN L&W Committee	Email Email Call	2016-08-05 2017-01-17 2017-02-22	Requesting meeting for closure plan Request to review LUP renewals LUP update
LKDFN Liaison	Call Site visit Workshop	2016-09-12 2017-01-24 to 2017-01-26 2017-02-21 to 2017-02-23	Closure meeting plan Site orientation, tour and Diavik overview incl. environment & closure update Liaison workshop with contractors & environment update
Yellowknives Dene First Nation (YKDFN)			
YKDFN - Implementation Committee	Meeting	2016-10-04	Diavik update: Closure, A21, site tour
YKDFN Chiefs, YKDFN representatives *Includes lands & wildlife staff & YKDFN SAO	Site visit *Email *Meeting *Email	2016-03-17 2016-10-29 2016-11-03 2016-11-04	Winter road tour: Diavik update included environment and A21 project Review of Engagement Plan V2.0 Closure update DDMI request to support NCRP closure design
YKDFN Community Representatives participate in environmental monitoring programs	Site monitoring program	2016-03-21 to 2016-03-28 2016-04-7 to 2016-04-12 2016-07-14 to 2016-07-26	YKDFN representative at site for 2 sessions with environment department assisting with wolverine monitoring program Vegetation & lichen survey
YKDFN Chiefs & Det'on Cho President, YKDFN Staff	Email	2016-04-04	Annual Sustainable Development report which includes environment & A21 information
YKDFN – Lands & Wildlife department	Email Email Meeting Email Email Email	2016-05-17 2016-07-20 2016-09-16 2016-11-08 2016-11-10 2017-01-17	Emailed copy of letter to Minister of ENR Minister's response to WLWB Closure planning presentation TK Panel recommendations DDMI request to support NCRP closure design Request meeting for Land Use Permit renewal
YKDFN Liaison	Meeting Site visit Workshop	2016-09-19 2017-01-24 to -2017-01-26 2017-02-21	Closure update, YKDFN site visit Site visit, tour and environment & closure update Liaison meet with contractors & environment update

Organization	Methods	Dates	Topics
YKDFN Elders Senate & YKDFN Chiefs, YKDFN Staff	Meeting	2016-11-17	Closure update
YKDFN Community	Public meeting	2017-04-26 2017-04-27	Closure update Closure update

Traditional Knowledge Panel

Caribou are at the forefront of many northerners' minds given recent declines in herd populations and, not surprisingly, discussions of caribou have been central to nearly all TK Panel sessions held to date. In response, this ninth Traditional Knowledge (TK) Panel session focused on caribou, particularly with respect to monitoring and managing caribou (and other wildlife) as a part of Diavik's closure plan. A review of available TK related to caribou was presented, including maps of caribou-related TK produced by various Aboriginal organizations and available to the public.

The TK Panel drew upon previous sessions related to caribou (TK Panel Session #4), observations made during previous site visits, a review of available TK presented as well as an overview of the current Bathurst Caribou Range Plan and regional wildlife research and management programs provided by a representative from the GNWT-ENR. Part of the session was also used to review the final closure plan for the North Country Rock Pile (NCRP) to allow the TK Panel to determine if they support the final design for the pile at closure.

The goals for Session 9 were to:

- provide a final opportunity for input and seek support / approval on the final closure plan for the North Country Rock Pile
- review a summary of existing TK of caribou that has been shared since the 1990s, prepared in response to a request from the TK Panel
- learn more about the current Bathurst Caribou Range Plan and the GNWT's wildlife research and monitoring programs
- provide guidance on ways to encourage safe movement of caribou and other wildlife on/around site and how best to monitor animals throughout closure

The following key themes emerged throughout the session:

i. The current closure plan for the NCRP is supported, with the conditions identified in current session recommendations

ii. Today and throughout closure, implementing traditional and other ways to direct caribou movement will help keep them safe.

iii. Today and throughout closure, caribou must be monitored.

iv. Caribou populations are suffering and need urgent help.

v. Ongoing stewardship must be encouraged through the development of a robust community-based monitoring program.

i. The TK Panel Supports the NCRP Closure Plan with Conditions

The final closure plan for the North Country Rock Pile was presented to the TK Panel for final approval. Details of where input and recommendations received from the TK Panel were integrated into the closure plan were provided. In particular, DDMI outlined their response to the following items, as detailed in the TK Panel Report for Session #9, Focus on Caribou (appended to DDMI CRP V4).

TK Panel Recommendations Addressed Within the Plan

- Create safe passage for caribou over the rock pile and through the site following their old migration routes on the north and south east sides (refer to map developed during session).
- Do not allow water to pool on top of the rock pile
- Have a 'moat' around the rock pile as a way of being able to contain and monitor the water that is coming out of the pile.
- Simulate an esker when considering the final shape of the rock pile.
- Safe wildlife access needs to be considered for all seasons when designing the final shape of the rock pile. There needs to be soft material in areas where caribou will be; consider the use of PK material for animal paths.
- Channel water flow to prevent contaminants from reaching Lac de Gras.
- Preference is to lower the height of the rock pile. However, if that is not possible, keep the rock pile height as low as possible while ensuring that contaminants within the Type II and III rock areas are contained.
- Create slopes on the rock pile similar to that on the test pile to support safe travel for animals.
- Ensure long term scientific monitoring of NCRP to determine if it remains frozen and stable.
- Leave some areas steep to encourage snow accumulation for wolverine and other denning wildlife (e.g. wolf, bear, fox, ground squirrel, etc.).
- Create barriers and other means between the rock pile and PKC to discourage animals from going into the PKC area.
- Focus water quality monitoring on the NCRP.
- Plan for climate change hundreds of years into the future.

TK Panel Recommendations Unable to be Accommodated within the Plan

- Cap the rock pile with the best materials for biodiversity based on TK and science, using nearby hills as a reference.

- Some re-vegetation should be planned for the rock pile. Consider use of good, black soil from the tundra or other eskers in the area. Plant native shrubs such as dwarf birch and willow in the soil near the bottom and allow the remainder to re-vegetate naturally.

Diavik's reason for not addressing the last two items is that it is not practical to simulate the natural environment on the NCRP. The final design would use available mine materials and reduce further impacts to the environment during reclamation. Similar materials and methods used to cover the test pile will be utilized for the NCRP and Panel members seem satisfied with the look of the test pile.

General discussion of the design and status of the NCRP followed with participants generally pleased with the final version, as indicated by their unanimous supporting vote (with two abstains from individuals absent from previous sessions).

The TK Panel was satisfied with the plan to use till and rock from A21 to cap the NCRP and discussed whether this would be stable enough to prevent seepage. For example, some delegates expressed concern about how climate change impacts to permafrost might impact the NCRP.

The suggestion was made to put some large boulders on top of the NCRP. Boulders would add the benefits of shade and microhabitat but could come with the costs of snow and water accumulation, which may then cause increased melt water and seepage. In the end, the TK Panel advised that a few (i.e., 2–3 large boulders) should be put on top of the NCRP and that snow accumulation patterns should then be monitored.

Next, the group discussed the proposed caribou "ramps" on the NCRP to enable safe caribou passage. Monitoring snowdrift and accumulation patterns on the ramps was considered to be important. As discussed extensively in previous TK Panel sessions, it will also be very important that the ramps are made of materials that encourage easy walking for caribou. The TK Panel has supported material similar to that on the slopes of the test pile, and feels it is important to ensure that large boulders near the bottom of the pile were covered or removed.

The TK Panel also discussed whether to re-vegetate at the base of the NCRP. Some participants didn't think this was necessary, but the majority thought this would be helpful, most notably in the areas where the collection ponds are located.

The TK Panel discussed and confirmed their ongoing support for the 3:1 slope proposed for the sides of the NCRP.

In summary, the TK Panel supported the revised closure plan for the NCRP with the condition that the related recommendations were supported:

- Re-vegetate the base of the NCRP around the collection ponds.
- A limited number of boulders (e.g., 3–4) should be placed on top of the NCRP to provide some shade for caribou, create habitat for small mammals and encourage natural re-vegetation.

- Study the wind and snow accumulation on caribou ramps/trails as well as the top of the NCRP.
- Ensure a gradual slope on the top of the NCRP so that there is a slight dome down the centre.

2. Directing Caribou Movement Will Keep Them Safe

The third key theme that emerged from the session is that today and throughout closure, implementing traditional and other ways to direct caribou movement away from hazards and towards easier walking routes will help keep caribou safe. Aboriginal peoples have long used their knowledge of caribou to guide their migrations and movements using strategically placed spruce trees or inuksuit so that caribou would funnel towards waiting hunters.

Panelists discussed how this knowledge could be applied to direct caribou away from hazardous areas such as cliffs or tailings ponds. Ways to direct caribou considered boulders (e.g., around PKC), boulder fences, traditional fences (e.g., trees, inuksuit), controlled burn and decoys (noises such as a high pitch, wolf calls or bells; or physical shapes such as owls or wolves).

During a women's breakout session, the group discussed general movement of caribou through the reclaimed mine-site and specified that they would like caribou deflected from the PKC area. They considered the construction of berms as a possible impediment to movement. The men's group identified on the map where they would like boulders placed to deflect caribou away from areas that may be unsafe. This included the shoreline of the North Inlet and the edge of the NCRP near the PKC. An innovative solution to use decoys or sounds to deflect caribou was considered by the men's group.

Regardless of whether methods to influence caribou movement and migrations are implemented, making the site safe again was forefront on the minds of panelists. Both groups discussed whether they wanted to encourage caribou to return to the Lac de Gras area and reuse their traditional routes after closure. Some people thought that the caribou should be deflected away from the area while others recognized that caribou will go where they like and so the site should be well prepared for the safe return of caribou.

Panelists understand that while caribou movement can sometimes be directed, caribou have their own mind and humans cannot always know how they will behave, nor should they try to control the caribou.

3. Caribou Must be Monitored Throughout Closure

Following a review of caribou monitoring recommendations made by the TK Panel in previous sessions, and an overview of present caribou monitoring on site, the group considered existing and future monitoring plans for caribou. Panelists discussed current collaring data and the use of GeoFence collars which are smaller and enable better data collection. These collars could continue to alert monitors to caribou presence in the area throughout and post-closure, and this information would continue to be shared between adjacent mines such as Diavik and Ekati. Today, caribou sightings at one site should be reported to the other (or, at closure, to

community monitors) and acted upon with a monitoring program. This suggestion came as part of a discussion advocating for the mines in this area to collaborate and combine monitoring resources. Finally, in keeping with community concerns about caribou health, panelists advised that the effects of collars on caribou need ongoing monitoring.

Since 2013, Diavik has used motion sensitive cameras for some aspects of wildlife monitoring, which the Panel was curious about and suggested might be another good way to monitor caribou through closure. The men's group provided specific suggestions as to where motion-sensitive cameras could be installed in multiple locations at and near the mine-site as a tool to help with monitoring.

Panelists agreed that monitoring is very important throughout all stages of closure and provides capacity building for community members to be monitors both during closure (2023–2025) and post-closure (2025–2030).

Any caribou monitoring program should consider both caribou and their habitat. During the session, panelists spoke to fire and other threats to caribou habitat today and into the future. Likewise, a monitoring program must consider animals other than just caribou. Changes in the health of some animals can be an indicator of overall ecosystem health which may, in turn, be influencing caribou.

Monitoring throughout different seasons and across the range (i.e., beyond just the mine site) is also important. Ultimately, any monitoring program requires commitment from community members, industry, government and others if it is going to continue long after the mine closes.

Finally, while the session focused on caribou monitoring, members of the TK Panel again expressed concern about ongoing closure monitoring for the whole mine site. Diavik assured the TK Panel that the site would be monitored until the final closure target date of 2030 and that Diavik would not be allowed to hand over the mine if there were serious contamination issues.

4. Caribou Need Our Help Now

The TK Panel discussed the current caribou "crisis" and suggested that a combination of predation (especially from wolves), overharvesting and sport hunting, environmental conditions (e.g., climate change, forest fires), exploration and development and disrespectful behaviour have led to declines in populations.

Panelists shared how they had predicted that changes in caribou would come when caribou weren't respected and expressed their worry for future generations if the caribou do not return. Concern for caribou is particularly personal for the TK Panel members who told of the close relationship between people and caribou and how northerners have long depended on caribou for cultural, spiritual, and economic well-being as well as for subsistence purposes.

People agree that caribou are in need of assistance but have various suggestions as to why the decline is happening and what actions or interventions would be helpful. The TK Panel discussed various ways to help caribou through traditional practices, predator harvesting, education, and healing ceremonies/communicating with the caribou. While many of these issues fall outside of

the scope of Diavik's responsibilities or practices, they provide context and a framework for what happens on-site today and how to plan for the future.

Ultimately, the TK Panel unanimously agreed that action must be taken to help caribou. Participants supported the need for a healing ceremony where people could ask for forgiveness from the caribou and offer their support in helping caribou return. They also advocated for people from various communities, agencies, and territories to work together.

5. A Robust Community-based Monitoring Program must be Developed and Transferred Upon Closure

While the TK Panel discussed the concept of a monitoring program, the last key theme that emerged was that the existing TK Camp should be transferred to the GNWT or another organization at closure and serve as the basecamp for community monitors after closure (i.e., 2025). Details around funding, liability, responsibility and more need to be fleshed out well in advance and while community members would like to develop and design the program (e.g., after the Haida Watchmen model), they would seek administration assistance from the GNWT. Other agencies could also use the station for cumulative effects monitoring and other initiatives. More details of the program could be discussed at a future TK Panel session.

6. Operational Activities & Compliance

The information below provides a summary of the operational activities that occurred during 2016. More detailed information can be found in the Type 'A' Water License annual report. Most of these activities will be repeated or continue to advance in 2017.

- 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 2016, 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.
- The Tibbitt to Contwoyto Winter Road operations were successful and Diavik trucked 3,941 loads to the mine site, and backhauled stored hazardous wastes for off-site recycling or disposal. The road was open from 9 February to 24 March 2016.
- Quarterly toxicity samples from stations 1645-18 and 1645-18B were collected in March, June, September and December.
- The average camp population for the year was 628.
- The open pit bottom elevations are 9000 (A154) and 9090 (A418) level; the surface of the water on Lac de Gras is 9415.5 m asl.
- A total of 6,217 m was developed underground, including 3,721 m of waste rock and 2,624 m of ore development.
- Collection pond dewatering activities were conducted on a regular basis.

Environmental Compliance

- DDMI requested that the SNP section of the Water License document be updated to edit and correct administrative errors and omissions which were contained within the program description following the Water License Reasons for Decision. The amendment did not request any changes to the SNP monitoring program itself. It was submitted to the WLWB on 14 June and approved on 12 October 2016.
- There were a total of 15 reportable spills that occurred on the mine site during 2016, both on surface and underground. Spill report forms are submitted to the GNWT and the Inspector follows up on spill clean up.
- A Total Suspended Solids (from disturbed lake bottom sediment) value of 28.5 mg/L was obtained on 10 July from an SNP station used to monitor A21 dike construction activities in Lac de Gras. This value exceeded the Water License criteria of 25 mg/L above background conditions. DDMI immediately notified the Inspector and placed a stop-work order terminating all dredging and filter placement activities.

  An investigation determined the increased turbidity was a result of the shore anchor on the south dike failing, causing the turbidity curtain to shift. In addition, damage to the

anchor chains on the turbidity curtain panels was identified by a dive team and it was observed that water currents were causing the affected panels to rise and fall within the water column, allowing more turbid water to escape below the curtain than would normally be the case, given the design of the curtain.

Following the incident investigation, several corrective actions were developed to mitigate the issue, as outlined in a letter sent to the GNWT Lands Inspector on July 12, 2016. In addition to best management practices for all in-lake construction activities, DDMI stopped or delayed in-lake construction activities for a total of 8 days and 21 hours in 2016 to ensure compliance with the TSS limit. These measures resulted in $772,720 of additional construction costs.

- In late 2015, the GNWT Lands Inspector noted deviations of rock placement in the North Country Rock Pile-Waste Rock Storage Area in comparison to the 2001 design. The Inspector identified specific items for DDMI to address in March 2016 and DDMI submitted a memo to the Inspector and WLWB to respond to these items on 12 April 2016. Most notably, the concerns related to storage of Type III rock in three areas of the NCRP (the CLR, NWR and SED areas), rather than the two identified in the design, and possible implications for the associated NCRP closure materials and costs. Additionally, some Type IIII material was used in construction of the A21 dike toe buttress. DDMI has submitted follow-up analysis to address seepage concerns (30 June and 12 October 2016, 11 January 2017), propose options for future waste rock storage/use through updates the Waste Rock Management Plan Version 7 and 7.1 (30 March and 16 November 2016) and submitted closure cost updates (16 October and 30 November 2016 and 3 March 2017) for the NCRP in response to directives and Information Requests from the WLWB. Copies of these communications are all available on the WLWB online registry.
- 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.

Surface Projects

- Construction of the A21 dike continued and in-lake rock placement for the dike was completed during 2016. A total of 69,604 m^3 of lake bottom sediments were removed with a dredge in order to build the dike.
- PKC construction activities included a reclaim barge road raise, repairs to the facility liner as well as to Collection Ponds 4 and 5, and interior road construction to support the test for making more sandy material and reducing the wet (slime)

material. Reports that outline findings from the test are submitted to the WLWB every three months.

- Minor updates to systems in the Sewage Treatment Plant, Potable (Drinking) Water Treatment Plant and the North Inlet Water Treatment Plant

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

- Constructed a vent bulkhead at D8910 for D Ramp ventilation and at A8960 for A Ramp ventilation.
- Constructed the A8995 level Sump.
- Built a Zacon door at S8975 and S8950 and frames for doors at A9045 and A9020.
- Excavated the A8985-A8920 Escapeway Raise and installed the ladder tube.
- Constructed the SLR abandonment bulkheads for the A9085 Level.
- Constructed the D8875 Level Sump.
- Completed two de-water casing holes between the A8995 Pump Station and the A8920 Pump Station; Installed a de-water drain line between the A8935 Gallery and the A8920 Pump Station, two more between the D8925 Pump Station and the D8875 Pump Station and one between the A8920 Gallery and the A8920 Pump Station.
- Constructed a Bumper Block at S8975 for Ore Pass 5.1.
- Constructed catwalks for: A9045 Level Sump, A9020 Level Sump, A9080 Haulage Drift Sump, A8970 Level Sump, D8850 Level Sump, D8925 Level Sump.
- Installed an I Beam in the A9020 Sump and replaced D9035 Ramp Sump Catwalk.
- Constructed a grizzly at A9065 for Ore Pass 6.
- Replaced the wooden door at the entrance to the RAD with a steel door.
- Constructed vent bulkheads at: top of the D Ramp Escapeway (N9025), D8885 D Ramp ventilation, A8985 to isolate the escapeway legs from A Ramp, A8920 for A Ramp ventilation.
- Constructed concrete pads for: A8995 for the A8995-A8890 Vent Raise, A154 Pit electrical cable upgrade project, D8875 for the D8875-D8825 Casing holes.
- Excavated the N8950-S8875 Escapeway Raise and installed the ladder tube.
- Excavated a vent raise between A8995 and A8890.
- Constructed a Bumper Block at S8950 for Ore Pass 5.2.
- Constructed a vent regulator at A9045 and S8925.

References for Further Information

Water Quality

- Monthly Surveillance Network Program (SNP) Reports
- 2015 Reports: Type A Water License, Seepage Survey Report
- AEMP Study Design Plan, Version 3.5 (2014)
- Three Year AEMP Results Summary for 2011 to 2013, v3.2
- AEMP Reference Conditions Report, Version 1.1
- 2015 and 2016 AEMP Annual Reports

All reports are available on the WLWB online registry.

Wildlife

- 2016 Wildlife Monitoring Report (includes 2016 PVP & Lichen monitoring report)
- 2012 Wildlife Monitoring & Management Plan
- 2013-2016 Comprehensive Wildlife Analysis Report

All reports are available on the EMAB online library.

Closure/Re-vegetation/Traditional Knowledge/Community Engagement

- CRP V4, including the TK Panel Session #9 Final Report: Caribou Management & Monitoring at Closure and summary of re-vegetation research to date (WLWB online registry)
- Final Closure Plan – Waste Rock Storage Area/North Country Rock Pile, Version 1.1 (WLWB online registry)
- Diavik Community Engagement Plan V1 (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 Program (EMAB online library)
- 2016 Air Quality Monitoring Report (Pending, 30 June 2017 – EMAB online library)
- National Pollutant Release Inventory (http://www.ec.gc.ca/inrpnpri/default.asp?lang=En&n=B85A1846-1)

Socio-economics /Sustainable Development

- 2016 Sustainable Development Report (http://www.riotinto.com/documents/Diavik_2016_Sustainable_Development_Report.pdf)

Management & Operating Plans (as per Table 2)

http://www.mvlwb.ca/Registry.aspx?c=Diavik%20Diamond%20Mines%20(2012)%20Inc.#

Appendix I

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. - Storage procedure for empty waste bins to minimize wildlife incidents - Liner repairs conducted in areas where seepage from the dam was 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.	- 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. - The waste rock pile is designed to encapsulate the rock with the highest sulphur content, and the PKC contains the waste kimerlite rock; each of these areas are surrounded by collection ponds to capture any seepage or runoff. - 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 are being identified and recorded.	- During Inspector's visits in 2016, 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. - 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. - Wildlife mortality in 2016 due to improper storage procedure for unused waste bins. - Some compliance issues identified with rock segregation practices in 2016 - incorrect use of Type III rock. - Installation of seepage collection wells has proven effective. - Seepage and runoff events have occurred in the past, but there were no such events in 2016. - Significant efforts undertaken to identify, inventory, remove, re-use or dispose of site infrastructure as a means of progressive reclamation. - Progressive reclamation opportunity for NCRP-WRSA identified and under review with WLWB during 2016.

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 - Seepage water quality to be within license limits. - 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. - 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.	- The North inlet provides retention time for mine water before treatment, allowing for ammonia reduction by natual attenuation; mine water discharge located far away from treatment plant intake. - Influent and effluent in the NIWTP is monitored consistenly 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; includes use of blast hole liners to reduce ammonia dissolution in water and limiting holding times for loaded blast hole patterns to 4 days for wet holes and 2 days for sump blasts. - 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 treatment, to reduce freshwater intake volumes. - Frequent visual inspections of areas downstream of dams, dikes & ponds. - Seepage intercepted with the use of sumps installed downstream of seepage areas. - Repairs to damaged infrastructure to prevent future seepage. - Source water (North Inlet, Collection Ponds, PKC) chemistry around site are monitored as part of the SNP. - On-going SES to determine mercury concentration/availability in fish and sediments within Lac de Gras. - 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 achors for A21 dike construction redesigned and reinforced.	- Ammonia levels in 2016 were well 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 2016. - Over 500 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 2015; fish and water quality were found to be good. - Action Level response plans for AEMP results are being identified and implemented. - PK trail began in 2016 to reduce amount of water in fine PK and increase coarse PK. - 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
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 BHP-Billiton and GNWT to gain further insite 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. - 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 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.	- 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 requried. - 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. - 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 operational 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.	- Mine-related wildlife incidents and mortalities have remained low over the years. - Two effective caribou herding events occurred at the airstrip in 2016. - One wolverine and one peregrine falcon were found dead in 2016.

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 supression, 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.	- Dust suppression on roads and mine areas using water during non-freezing periods. - New crusher comissioned 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). - 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. - Transition to a completely underground mine has reduced dust levels from previous years. - 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 2016. - The transition from open pit to underground mining reduced dust levels from blasting. - A21 dike construction caused an increase in dust levels during 2016. - Dust levels are below the BC Objectives for mining operations. - TSP levels in 2016 were below the GNWT Ambient Air Quality Guideline within the vicinity of the mine site, except for one reading.
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. - 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 facilties 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 3.4 million litres in 2016. Wind power provided 7.6% of the mine's power needs in 2016.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Hazardous Materials	- No significant spills or non-compliance issues. - Maintenance and disposal practices that minimize possible environmental impacts	- All reported spills are investigated and taproots are conducted on external spills. - Electronic system for SDS tracking for chemicals on site. - New products being brought to site are reviewed by Health, Safety and Environment personnel. - Equipment identified as having issues relating to frequency/volume of spills can be taken out of service for repairs/overhaul, as required. - Vehicle inspection and storage procedures improved in an effort to reduce spills. - Scheduled preventative maintenance for heavy equipment. - Addition of underground spill response procedures to the Contigency Plan (CP). - Evaluate best practices for spill prevention and hazardous material storage underground. - Revised Contingency Plan to be more user-friendly in the event of an incident.	- Orientation and specific training for employees and contractors is provided for storing and handling hazardous materials. - Regular waste inspections are conducted by Environment Staff at the Waste Transfer Area and Landfill. - A site-wide compliance inspection is also completed weekly. - Hazardous materials are backhauled each year on the winter road; materials are either recycled or disposed of in a safe manner. Prior to backhaul, hazardous materials are stored and inventoried at the Waste Transfer Area (contained, lined area). - A Lube Storage Building was built beside the truck shop to fully contain maintenance products. - Containment facilities exist for underground product storage and dispensing, as well as above-ground tankfarms - Pipelines that feed the powerhouse from the south tank farm are encased in cement. - All employees and contractors take WHMIS training. - NIWTP expansion provided improved containment for sulphuric acid and other water treatment chemicals stored on-site. - Alternative biodegradable products are encouraged, as are bulk orders. - Spill containment & clean up kits are located throughout the mine site (on surface & underground). - The on-site Emergency Response Team has spill response equipment & capabilities, and practices such drills annually. - Installation of a waste oil burner at a plant on site to reduce on-site storage, shipment and off-site disposal risks with backhauling product. - Use of absorbent berms or skimmers to remove oil from water in underground sumps. - Hydraulic hoses on underground equipment are wrapped in a plastic sheath to prevent leaks or blow outs caused by abraded or cut hoses. - Dedicated hazardous material disposal areas underground that separate out the various waste streams.	- Spills are reported, recorded and quickly and effectively cleaned up. Follow up actions resulting from external spills are documented and reported to the Inspector. - No significant hazardous materials compliance issues were identified in 2016. - Spill volumes and frequency from problem equipment remained low during 2016.