

ENVIRONMENTAL MONITORING ADVISORY BOARD FOR THE DIAVIK MINE

Working with *the* People *for the* Environment



ANNUAL 2019
2020
REPORT



Photo courtesy of Diavik Diamond Mine



ENVIRONMENTAL MONITORING ADVISORY BOARD FOR THE DIAVIK MINE

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REPORT CARD ON THE ENVIRONMENT

This report card has three purposes:

- Set out broad changes in the environment at Diavik since the mine started
- Compare changes to predictions Diavik made during the Environmental Assessment of the project
- Assess how well Diavik and the regulators are managing the changes

WATER

[see pages 21-26 for more details]

The main way Diavik monitors water and fish in Lac de Gras (LdG) is through the Aquatic Effects Monitoring Program (AEMP). Water quality at Diavik is within the Water Licence limits, and within the predictions Diavik made.

EMAB has not received the 2019 AEMP report, so information presented is current to March 31, 2019:

- LdG is experiencing mild nutrient enrichment due to the mine.
 - › Enrichment is caused by phosphorus and nitrogen Diavik puts into Lac de Gras.
 - › Nutrient enrichment affects the lake ecosystem by increasing the amount of algae.
- The amount of LdG affected by nutrient enrichment varies from year to year.
 - › The extent of the area affected has shown large and variable changes over the last few years (10% of the lake in 2015, 43% in 2016, 26% in 2017 and 15% in 2018).
 - » Predicted extent is 20% of LdG.
 - › Diavik only samples far-from-mine areas of LdG every three years.
 - › EMAB has recommended that Diavik should test far-field sample sites every year.
- Dust from the mine settles on the lake and adds phosphorus to the water.
 - › Phosphorus in dust contributes to nutrient enrichment but we don't know how much.

Photo courtesy of Diavik Diamond Mine

FISH AND AQUATIC LIFE

[see pages 21-26 for more details]

There are many kinds of aquatic life in LdG and they can be useful indicators of aquatic health. They are also food for fish. Diavik measures plankton and benthics to assess aquatic health. Monitoring results for fish and other aquatic life are within water licence limits, and predictions.

EMAB has not received the 2019 AEMP report, so information presented is current to March 31, 2019:

- Plankton are microscopic plants and animals that live suspended in the water.
 - › Types of plankton near the mine are different than far away, likely because of more nutrients.
- Benthic invertebrates are small creatures that live on the lake-bottom (e.g. snails and worms).
 - › The density of benthics is higher near the mine than further away.
 - › Fish eat benthics, so changes in the number and type of benthics can affect fish populations.
- Monitoring of mercury levels in Lake Trout has been a concern since 2012, when Diavik stopped formal monitoring of mercury in Lake Trout.
 - › Mercury levels in Lake Trout have varied over time, and exceeded predictions in six of 11 years.
 - » Mercury levels in fish in other NWT lakes have also varied.
 - › Diavik predicted mercury levels in Lake Trout would not go above the existing background concentration of 181.5 µg/kg in LdG during the Environmental Assessment; however, the levels in some Lake Trout have been above this amount.
 - › Mercury has not been found in Diavik's effluent.
 - › EMAB is conducting a special analysis of all the Lake Trout mercury data.
- EMAB recommended that Lake Trout should be sampled every three years.
- EMAB is concerned about the ability to detect mercury in slimy sculpin and Lake Trout as proposed under Diavik's Aquatic Effects Monitoring Program (AEMP) Design Plan 5.1.
 - › Design Plan 5.1. indicated that Diavik's analyses do not detect change very well.
 - › Design Plan Version 5.1 was not approved by the WLWB.





WILDLIFE

[see pages 44-51 for more details]

Diavik monitors caribou, grizzly bear, wolverine, raptors and the vegetation they feed on through a Wildlife Monitoring Program (WMP). In general effects on these animals and plants are within the predictions Diavik made during the environmental assessment.

Highlights for 2019/20:

- The estimated population size of Bathurst caribou has dropped by about 20 times since the mine was built. They are also staying further north of the mine until late fall; they used to arrive at Diavik in July.
 - › Since there are less caribou around the mine, it is harder to do the monitoring now.
- The mines have been shown to have a Zone of Influence (ZOI) on caribou. Caribou tend to stay away from the ZOI.
- › Surveys showed the mine ZOI was about 14 kilometres. This was larger than Diavik had predicted.
- › Diavik did a re-analysis of the ZOI in 2019. This analysis concludes there is no ZOI from the mine.
 - » EMAB found a number of issues with the re-analysis.
- Diavik is struggling to collect enough Caribou behaviour data to complete behaviour analyses.
 - › We want to know how Caribou behave near the mine, compared to how they behave far away from the mine.
- In 2019 Diavik stopped monitoring Caribou deflections around the mine.
 - › Previous monitoring shows that Caribou sometimes do not follow predicted migration patterns around the mine.
 - › EMAB disagrees with stopping deflection monitoring. Monitoring should continue for the life of the mine. Diavik should find a way to improve the monitoring program instead of stopping it.
- In 2019 Diavik did a comprehensive analysis of wolverine snow track data.
 - › The analysis showed that wolverine are slightly less likely to be in areas closer to the mine, and slightly more likely to be in areas of better habitat.
- Grizzly Bear or wolverine DNA monitoring continues to be on hold since GNWT has not given direction to Diavik, or other mines, about when to start again.
 - › GNWT has committed to hold a workshop in fall 2020 to decide on next steps.
- In the last few years Diavik has been making changes to the way they monitor wildlife from year to year.
- EMAB recommended that Diavik prepare a new WMP description and Diavik agreed. The new version will be reviewed by EMAB and the GNWT.



CLOSURE PLANS

[see pages 32-44 for more details]

Diavik submitted a revised closure plan, ICRP Version 4.1, in December 2019. This plan is significantly improved over ICRP Version 4.0 and addresses many of the concerns EMAB raised in our previous review.

ICRP 4.1 includes much more detail, allowing for EMAB to do a useful review and develop comments and recommendations to submit to the WLWB. The submission deadline is September 15, 2020. The Closure Plan is supposed to be finalized by 2022.

Highlights for 2019/20:

Overall, ICRP Ver. 4.1. is an improvement from previous versions, however EMAB has concerns with some parts of Diavik's closure plan, including:

- Revegetation – Diavik is proposing to do revegetation on about 18% of the site using native grasses. Vegetation covered about 70% of the site before development; EMAB wants revegetation to cover that same amount of the mine footprint.
 - › Diavik had a study of revegetation done by University of Alberta, but does not plan to follow the study's recommendations.

AIR QUALITY

[see pages 52-55 for more details]

Diavik monitors air emissions and dust that is in the air, and that falls to the ground through its Environmental Air Quality Monitoring Program (EAQMP). The results are generally within predictions but EMAB has concerns about the way the monitoring is being done, and recent changes.

Highlights for 2019/20:

- EMAB received Diavik's 2018 EAQMP report for review in 2019.
 - › In 2018 one of Diavik's Total Suspended Particulate (TSP) monitors was not working all of 2018. The other was

out-of-order for 14% of the year, or an average of one day a week.

- In 2019 Diavik stopped TSP monitoring.
 - › EMAB disagrees with this change and made recommendations to improve the TSP monitoring.
 - › EMAB notes that dust levels have gone up since Diavik started mining the A21 pit; these should be monitored for TSP.
- EMAB does not think the EAQMP is adequate.

EMAB has submitted a request to the Minister to review Diavik's EAQMP to assess if it is adequate.

- **Size of Mixing Zones** – Diavik is now proposing 15 mixing zones covering over 2 square kilometres. This is a big improvement over the 25-sq.-km zone they proposed in the previous plan. These zones are areas affected by contaminated runoff and seepage from the mine. Diavik doesn't have to meet aquatic health guidelines inside these zones. EMAB wants the mixing zones to be thoroughly monitored.
- **Effectiveness of the cover on the North Country Rock Pile** is still uncertain, particularly when the effects of climate change are considered. Sampling shows that much of the cover does not meet moisture content requirements at this time. If the cover thaws it could result in contaminated runoff.
- **Wildlife Safety** – Diavik should plan to make sure wildlife cannot hurt themselves walking around the mine, and that the vegetation and water are safe for wildlife to eat and drink. EMAB has concerns about:
 - › Diavik plans to leave some large areas of the rockpiles steep and rocky.
 - › Criteria for water safety for wildlife and humans appear insufficient.
 - › There are no criteria for contamination of vegetation.
 - › Their plan should be revised to address these inadequacies.
- **Processed Kimberlite Containment Facility (PKC) or tailings pond** – the proposed plan to close the PKC has many risks and uncertainties; a lot of work needs to be done here. Diavik is still deciding whether a wet cover or dry cover will be more likely to succeed. They will submit a PKC Design Plan in early 2021 that EMAB hopes will address the current concerns.
- **Contaminated soil** – Diavik wants to bury any soil that doesn't meet guidelines. EMAB wants Diavik to begin treating any contaminated soil as soon as possible and take it offsite if it doesn't meet agricultural standards.



Photo courtesy of Diavik Diamond Mine

- **Closure Criteria** – these are critical to successful closure. Diavik has improved many of its proposed criteria, but some are still not adequate.
- **Security Estimate** – Diavik has submitted an updated security estimate. There are still several big uncertainties where the security is likely not high enough, including the NWRSA, PKC, long term monitoring including TK-based monitoring, and the possible need for long-term water treatment.
- **Long-term maintenance and monitoring** – EMAB expects that parts of the mine will need a very long time before we can be sure there will not be problems. Diavik has extended the length of its monitoring program after closure, but it may not be long enough.
- **Traditional Knowledge (TK)** – Diavik has committed to developing a TK-based monitoring program. Diavik includes input from a TK Panel in its closure plan. The Panel includes members from each Aboriginal Party to the EA. EMAB has observed the Panel's meetings. EMAB is reviewing the Panel's recommendations to see how well they have been included in the plan.

ABOUT US

EMAB Photo



EMAB Staff, Diavik staff, and Directors on a tour of the Diavik mine site.

HOW EMAB WAS FORMED

The Environmental Monitoring Advisory Board (EMAB or the Board) exists because of the Environmental Agreement for the Diavik Diamond Mine. The Environmental Agreement came into effect in March 2000. It was signed by five Aboriginal Parties, the Federal and Territorial governments and Diavik. EMAB is the environmental watchdog organization created by the Environmental Agreement. EMAB makes sure the environment around Diavik remains protected. The Environmental Agreement states EMAB will work independently and at arm's length from Diavik and the other Parties who signed the agreement.

WHY THE ENVIRONMENTAL AGREEMENT IS IMPORTANT

The Environmental Agreement is a legal contract between the Parties. It says what Diavik and the Parties must do to minimize environmental effects of the mine. The Environmental Agreement says Diavik must meaningfully involve the Aboriginal Parties in environmental monitoring at Diavik mine. This includes the use of Traditional Knowledge and Inuit Qaujimajatuqangit (TK/IQ). The Environmental Agreement sets out EMAB's mandate.

WHAT EMAB DOES

EMAB was set up in 2001 and is in its 19th year of operations. EMAB's mandate covers four main areas:

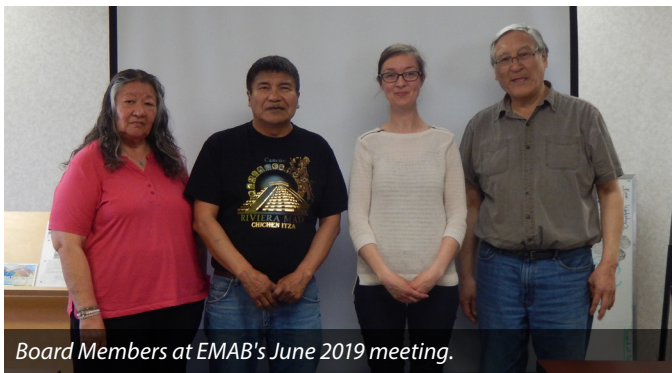
1. Oversight and Monitoring
2. Aboriginal and Community Involvement
3. Communications
4. Leadership and Governance

WHO WE ARE

There are eight Parties to the Environmental Agreement. Each Party appoints one Director to the Board. EMAB has two staff members:

- Executive Director
- Environmental Specialist

Since December of 2013, the GNWT and the Government of Canada have taken steps to amend the Environmental Agreement as a result of the Devolution process. Their plan is for Canada to remain a Party but with many of Canada's responsibilities transferred to the GNWT. This is an ongoing process. Canada has delegated its authority regarding the Environmental Agreement to the GNWT in the meantime.



Board Members at EMAB's June 2019 meeting.

WHERE WE ARE LOCATED

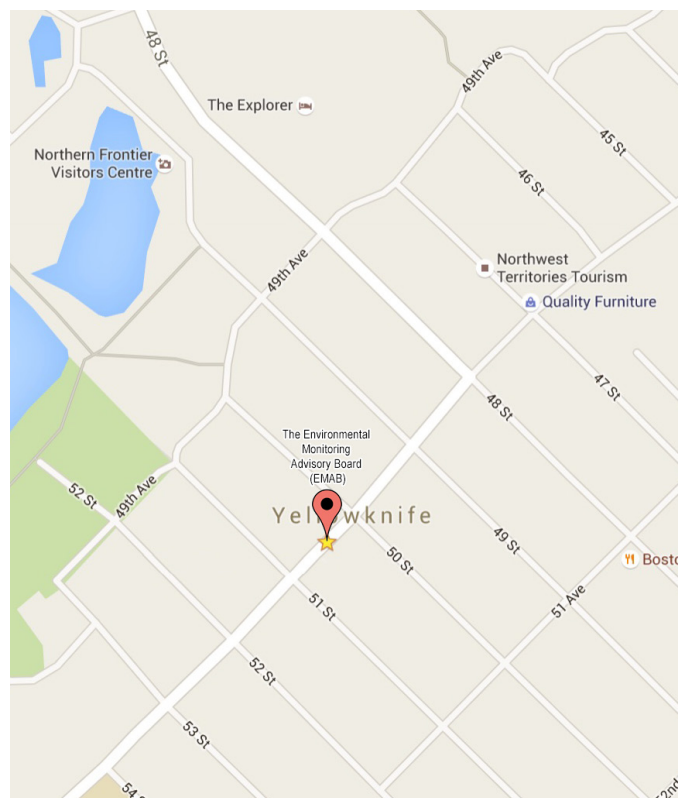
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Phone: **867-766-3682**

Email: **emab1@northwestel.net**

Website: **www.emab.ca**

Facebook: **facebook.com/EMAB2015**



CHAIR'S MESSAGE

EMAB is the watchdog for the environment at the Diavik mine. Our job is to hold the mine, and the regulators, to account – to do their best to protect the water, animals, fish and air. Board members are appointed by their respective Parties to make good decisions about this important job, so we all feel their trust and our responsibility. We look for changes at the mine. We receive Diavik's plans for protecting the environment and make recommendations on how to make them better. We go over Diavik's reports on the effects they are having on the environment to make sure we understand any changes, and make recommendations about ways to improve the monitoring and management. We talk to our community members and bring their concerns back to the rest of the Board.

This year EMAB was affected by the COVID-19 pandemic, just as the rest of the world. We took the virus very seriously and wanted to make sure we kept everyone safe and didn't contribute to any possible spread of the virus. I told EMAB staff they could work from home and put all community updates on hold. We decided not to hold any in-person Board meetings until it became clear whether it was safe, and until we knew best practices to prevent infection and spreading.

EMAB has new Board members this year that I would like to welcome: Violet Camsell-Blondin (TG), Sarah Gillis (YKDFN), and Dinah Elliott (Canada)



were appointed to the Board this year. I would also like to recognize the contributions of Sean Richardson and Machel Thomas, our outgoing Board members. Sean's dedication, enthusiasm and hard work during his six years on the Board were much appreciated, including his time chairing the Board. Machel served for half a year, including a period as Secretary-Treasurer.

Last year EMAB approved a new Action Plan for the next five years that responds to the needs of the Parties to the Environmental Agreement, the issues EMAB faces and the activities taking place at Diavik. We will continue to focus on technical reviews of plans and reports in our key priority areas while working with communities to keep them informed of EMAB's role, activities and key findings.

Diavik applied for a major water licence amendment in 2018 to place the processed kimberlite into the open pits once they are mined out. Last year the project was sent for an environmental assessment and EMAB was very active in that review. We made an intervention to the Mackenzie Valley Environmental Impact Review Board explaining our concerns about the project. The Minister has agreed that the project can go ahead with a number of important conditions that speak to EMAB's concerns. The next step will be a water licence hearing to develop the details of how the project can be carried out successfully, and EMAB plans to be actively involved in that.

The TK Panel, administered by Diavik, met once last year. They talked about whether the open pits, where Diavik wants to put the processed kimberlite, can be re-joined with Lac de Gras. We were pleased that the Panel invited

EMAB to attend the entire meeting and found it was very useful to see how the members worked together. They developed a number of recommendations for the project to proceed safely, and ways to monitor the effects using TK.

Diavik plans to keep mining for another five years, then start closing it in 2025. They have proposed some big changes to their closure plan that address many of the concerns EMAB has pointed out. We are doing a thorough review of the new plan, including expert technical reviews and Diavik's use of Traditional Knowledge/Inuit Qaujimajatuqangit, especially the recommendations from the TK Panel. We hear from communities that they want the minesite to be returned as closely as possible to the way it was before the mine started, and we use this vision to guide our recommendations. We have also been talking with Diavik about involving people from local communities in monitoring the environment after closure, and hope to be able to report on that in the next year. We have been pushing to make sure that monitoring after closure will include TK.

This will be another busy year coming up for EMAB. We will continue to work with Affected Communities to keep you informed and involved in helping to protect the environment at Diavik. I encourage everyone to get in touch with the Board member from your area if you have ideas or concerns.

Marsi Cho
Charlie Catholique,
Chair

WHAT HAVE WE DONE THIS YEAR?

EMAB Photo



EMAB works with the people of the Affected Communities to help protect the environment around the Diavik mine.

This is a summary of our activities in 2019-20, with more detail on the following pages. Readers can also visit our website: www.emab.ca.

COVID-19

EMAB's activities in the last quarter of 2019-20 have been affected by the COVID-19 pandemic, and will continue to be for some time longer. EMAB's goal is to do our best to follow the directives and guidance of the GNWT and Government of Canada, and particularly the NWT Chief Public Health Officer. We want to make sure our staff, our Board members, members of our communities

and others we work with are safe and that we are not exposing them to the virus. This affects our operations, and particularly our Board meetings and community updates.

GOVERNANCE:

The Board finalized and approved an Action Plan for 2019-24. EMAB's emphasis continues on doing technical reviews of Diavik's plans and reports, and making them accessible, particularly to Aboriginal Parties and Affected Communities. We provide these to the Parties for their information and use in making their own interventions to regulators. The plan also recognizes the changed role of the Traditional Knowledge Panel, and EMAB's role in working with the panel. It highlights the need for tracking collection and use of TK/IQ by Diavik.

COMMUNITY INVOLVEMENT:

EMAB held two community update meetings with the Kitikmeot Inuit Association and North Slave Métis Alliance.

OPERATIONS:

EMAB's budget for 2019-20 was \$553,395. A new Environmental Specialist, Janyne Matthiessen, started in May 2019.

REVIEWING REPORTS:

In 2019-20 EMAB reviewed 15 reports and plans from Diavik; most of them were also reviewed by EMAB's technical experts. These reports are required by the water licence, fisheries authorizations and the Environmental Agreement. EMAB focuses on reports that are in our priority areas (water, air, wildlife, closure and TK/IQ). EMAB was also involved in the Mackenzie Valley Environmental Impact Review Board's Environmental Assessment of Diavik's proposed project to put Processed Kimberlite

directly into one or more of the open pits, including intervening during the technical hearing, and reviewed Diavik's application to amend its water licence to allow underground mining of the A21 pit.

COMMUNICATIONS:

EMAB regularly updated our website. We circulated our annual report in December and developed a two-page annual report summary. People can comment on reports or EMAB recommendations through our Facebook page: facebook.com/EMAB2015.

BOARD MEETINGS:

The Board met nine times in 2019-20: five face-to-face meetings and four conference calls. Board members visited the mine site in June 2019.

The Board membership changed during 2019-20. New Board members were appointed by Tłı̨ch̨ Government, Yellowknives Dene First Nation and Canada.

WHO ARE WE?

There are eight parties to the Environmental Agreement. Each party appoints a member to the Board.



Charlie Catholique,
Chair
Łutselk'e Dene First Nation



Jack Kaniak,
Vice Chair
Kitikmeot Inuit Association



Violet Camsell-Blondin,
Secretary Treasurer
Tłı̨ch̨ Government



Julian Kanigan
Government of the
Northwest Territories

WHAT DO WE DO?

REVIEW Diavik's monitoring programs and reports with the help of technical experts

PROVIDE comments and recommendations to Diavik, the regulators and Parties to the Environmental Agreement

EVALUATE Diavik and regulators to make sure commitments are kept

PARTICIPATE in the regulatory process as a reviewer and intervenor

ADDRESS regulatory gaps including wildlife management, air quality and securities

COMMUNICATE through workshops, community information sessions, our website and annual report



ASSESS Diavik's use of TK/IQ in environmental monitoring program design

SUPPORT participation of Aboriginal Peoples in monitoring Diavik

LISTEN to community concerns and bring those forward to Diavik



Arnold Enge
North Slave Métis Alliance



Gord Macdonald
Diavik Diamond Mines
(2012) Inc.



Sarah Gillis
Yellowknives Dene First
Nation



Dinah Elliott
Canada

*Violet Camsell-Blondin replaced Sean Richardson in May 2019;
Sarah Gillis replaced Machel Thomas in November 2019;
Machel replaced Napoleon Mackenzie in May 2019.*

ENVIRONMENTAL SETTING OF DIAVIK MINE

Lac de Gras (LdG) is a large lake, 60 kilometres in length, with an average width of 16 kilometres and 740 kilometres of shoreline. This lake is located roughly in the center of the Slave Geological Province, north of the tree line, and in Canada's Southern Arctic ecozone. The area is cold and dry. LdG is the headwaters of the Coppermine River, which flows 520 kilometres north to the Arctic Ocean. Typical of arctic lakes, it is cold with long ice-covered periods and with little food for fish and other creatures. Fish species include Lake Trout, Cisco, Round Whitefish, Arctic Grayling and Burbot. LdG is also near the center of the Bathurst caribou herd range. Since 2016 there has been a noticeable increase in Beverly/Ahiak caribou in the LdG area in the winter and spring. The Bathurst caribou population has declined considerably from 186,000 in 2003 to 8,200 in 2018 (source: GNWT). Many other animals include the LdG area in their home ranges, such as grizzly bears, wolves, wolverines, smaller mammals, migratory birds and waterfowl.

DIAVIK NOW

(courtesy of Diavik)

Diavik is working hard to manage the current realities of the diamond market and considering options for the future. We are continuing our work on progressive land reclamation, studying the feasibility of mine extensions, planning and preparing for closure, all the while supporting Rio Tinto's continued drilling programs within the area.

In terms of our community contribution programs, Diavik continued to provide financial and in kind resources to many local organizations, such as the *NWT On the Land Collaborative* offering land-based activities across the territory. We also funded a new scholarship for women in the NWT and Kitikmeot region to pursue postsecondary education in science, technology, engineering and math programs.

In September 2019, the Traditional Knowledge (TK) Panel considered various options for pit closure, particularly the possibility of placing PK into the pits and discussed criteria for reconnecting the pit lakes to Lac de Gras. Through their work, the TK Panel developed 15 recommendations related to options for

pit closure. To date, the TK panel has provided a total of 206 detailed recommendations for consideration by Diavik and other parties.

As we move into 2020 we will continue to deliver training, employment and business benefits to local communities, while meeting our commitments to protect the environment and generate economic prosperity for our investors. As always, our priority is the safety of our workforce with the ultimate goal of a zero harm operation.

Diavik at a glance

- Four ore bodies: A21, A154 South, A154 North, and A418
- Spending (2000 to 2019): C \$8.5 billion (\$6.1 billion northern, of which \$3.2 billion was Indigenous)
- Operations workforce (2019): 1,124 employees (555 northerners)
- 2019 rough diamond production: 6.7 million carats
- Reserves: 10.5 million tonnes at 2.4 carats per tonne (31 December 2019)
- Total rough diamond production: 124.1 million carats (2003 to 2019)

INVOLVING AND SUPPORTING COMMUNITIES



September 2019 TK Panel Session.

EMAB Board members appointed by Aboriginal Parties are a key link between the Board and Affected Communities. They are able to update community members on EMAB activities and report to the Board on concerns raised by the community. In the past EMAB has set aside a budget to support members to update their communities, but with cuts to EMAB's overall budget and a lack of uptake by Board members, this community consultation budget is now minimal.

EMAB reviewed 15 reports and plans in 2019-20. All these reviews were forwarded to the Parties to the Environmental Agreement and the land/environment managers for each Party. Technical reviews always include a plain-language summary to make them more useful for general readers. EMAB also makes these reports available on our website.

EMAB's community involvement was affected by the COVID-19 pandemic in a number of ways:

- directives from the Chief Public Health Officer
- Board decisions regarding actions to assure the safety of Board members, community members and staff with respect to COVID-19 exposure, and
- respect for concerns of community leadership regarding potential exposure.

EMAB's Board member for the Kitikmeot Inuit Association (KIA) met with the KIA Board on July 11, 2020 to update them on EMAB's activities and current major issues. The Board members were pleased with the presentation and did not raise any specific concerns.

EMAB held a community update with the North Slave Métis Alliance (NSMA) by teleconference on March 17, 2020. Six members and staff attended from NSMA. The major issues raised were:

- Water quality resulting from placing PK in pits, then breaching dikes
- PKC closure and moving slimes to pits
- Dust control

Following the finalization of EMAB's Action Plan for 2019-24, EMAB has added some actions to provide more information to communities. In particular EMAB now provides a 1-page summary of each Board

EMAB Photo

meeting to the leadership of each Aboriginal Party. EMAB has also developed a 1-page annual report summary which is available on our website and provided to community members as a brochure.

EMAB met with Diavik staff in June about ways for Aboriginal people and communities to be involved in monitoring the environment at the mine after closure. We have requested that Diavik provide information on qualifications the company will require. Diavik informed the Board that they are in the planning phase for post-closure monitoring. EMAB noted that it will be important to establish training programs early to ensure interested people meet qualifications prior to the start of hiring. Diavik also noted that they could look at contracting for monitoring as an option. Diavik's planning for post-closure monitoring will be completed by end of 2021.

TRADITIONAL KNOWLEDGE/ INUIT QAUJIMAJATUQANGIT (TK/IQ)

One of EMAB's objectives is to assess the use of TK/IQ in Diavik's monitoring programs. We also request that Diavik provide an annual update on use of TK/IQ at the mine. Staying aware of Diavik's use of TK/IQ in environmental management at the mine is a priority for EMAB. Ensuring that involvement of community members is meaningful is also a priority. EMAB has tried various ways to encourage Diavik to take more action to meaningfully involve Indigenous groups. Meaningful involvement of Indigenous groups is an EA requirement.

Another EMAB objective is to develop a reporting procedure for TK with the Traditional Knowledge Panel.



September 2019 TK Panel.



September 2019 TK Panel.

In 2011 EMAB became more actively involved in bringing TK/IQ holders together as a Traditional Knowledge Panel, to address issues such as caribou and closure planning. Then in 2013 Diavik began to take a greater role in facilitating the Traditional Knowledge Panel, with EMAB assessing the results of the work and Diavik's response. EMAB also made recommendations to Diavik on ways to more effectively work with the panel. The Panel had finalized 194 recommendations as of October 2019.

Photo courtesy of Diavik Diamond Mine

EMAB is pleased to see that Diavik has made efforts to include TK/IQ in closure planning through the TK Panel. Panel recommendations, and Diavik's responses, are included as part of Diavik's closure planning reports and can be found on the EMAB website: www.emab.ca. Full TK Panel reports can also be found on EMAB's website.

2019 TK PANEL

The TK Panel met once this year from September 12-16, 2019. EMAB attended for the full Panel meeting for the first time. In previous years EMAB has only attended the final day. The topic of the Panel session was "Options for Pit Closure". Diavik wanted to know what the Panel thought about putting PK in the pits, and to start developing TK-based criteria for the PK to Pits project. Discussions focused on why Diavik wants to put PK in the pits, and developing TK/Cultural Criteria for PK disposal, and closure of pits containing PK. The Panel was generally supportive of the idea to put PK in the pits if it can be done safely and there is TK monitoring.

Diavik has cancelled TK Panel meetings for 2020 due to potential exposure to COVID-19.

TK PANEL RECOMMENDATIONS REVIEW

EMAB is currently doing our own review of Diavik's responses to the Panel recommendations. EMAB has examined all of the Panel recommendations and Diavik responses and assessed whether or not Diavik accepted the recommendation.

In general, it appears Diavik accepted a little over half of the Panel's recommendations, sometimes with modifications. In some cases, it is unclear how Diavik has accepted, rejected, or implemented a TK Panel recommendation. EMAB is developing a list of questions to clarify the status of each recommendation that Diavik accepted.

EMAB's review is being updated to include 16 new TK recommendations from the September 2019 Panel meeting. EMAB plans to finalize this review in 2020-21 and will report back on the results. EMAB will also look at how the Panel's recommendations have been incorporated into future closure plans.

OVERSIGHT AND MONITORING

EMAB Photo



EMAB monitors Diavik and regulators to make sure they are doing a thorough job protecting the environment around the Diavik mine, and are keeping the promises they made in the Environmental Agreement.

Most of EMAB's focus is on Diavik's environmental monitoring programs and reports, and on the way the regulators handle them. When EMAB notes concerns coming from regulators we take that as a signal that we need to know more about the issues. These issues are outlined in the following pages.

Each year we do our own reviews of the Wildlife Monitoring Program report and the AEMP report. We also review reports on Air Quality and on Closure and Reclamation. We review other reports and documents on a case-by-case basis.

WHO ARE THE REGULATORS AND MANAGERS?

- **Wek'èezhìi Land and Water Board (WLWB)** is responsible for the issuance of Diavik's water licence and land use permits and the technical review of all documents required under the licence and permits. The WLWB is a regional panel under the Mackenzie Valley Land and Water Board.
- **Canada**
 - › **Department of Fisheries and Oceans (DFO)** reviews some of the reports submitted under the water licence and all the reports submitted under the fisheries authorizations.
 - › **Environment and Climate Change Canada (ECCC)** reviews the reports required by the water licence focusing on water and air quality as well as section 36 of the *Fisheries Act*.

- **Government of the Northwest Territories (GNWT)**

- › **Department of Lands** reviews reports required by the land use permits. Lands has an inspector assigned to Diavik. This inspector updates the Board regularly to keep us aware of what is happening at the site. The inspector is also responsible for ensuring Diavik meets the terms of its water licence, land use permits and land leases.
- › **Environment and Natural Resources (ENR)**, has responsibility for environmental protection, including air and water quality, and provides detailed reviews of reports in these areas. It also has regulatory responsibility for wildlife,

including monitoring under the *Wildlife Act*. It also proposes better ways to monitor effects of Diavik on wildlife. The Minister of ENR approves Diavik's Type A water licence.

- **Wek'èezhì Renewable Resources Board (WRRB)** is a wildlife co-management authority established by the Tłı̨chǫ Agreement. The WRRB is responsible for managing wildlife and wildlife habitat (forests, plants and protected areas) in the Wek'èezhì area. It reviews reports submitted under the Water Licence. They have not commented on reports submitted under the EA, such as the WMP and the EAQMP.

TECHNICAL DOCUMENTS EMAB RECEIVED FOR REVIEW IN 2019-20

Report Name	Date Received	Regulatory Instrument
Type 'A' Water Licence (Annual, 2018)	March 29, 2019	Water Licence
Wildlife Monitoring Program (WMP) (Annual, 2018)	April 1, 2019	Environmental Agreement
AEMP (Annual, 2018)	April 11, 2019	Water Licence
Scope of EA – PK to Pits Project	April 18, 2019	MVRMA
Information Request from MVEIRB	April 29, 2019	MVRMA
Summary Impact Statement and Information Requests – PK to Pits Project	May 17, 2019	MVRMA
EAAR - 2018	June 6, 2019	Environmental Agreement
Comments on Information Requests – PK to Pits Project	June 18, 2019	MVRMA
Environmental Air Quality Monitoring Program (EAQMP) (Annual, 2018)	July 10, 2019	Environmental Agreement
Seepage Report (Annual, 2018)	August 1, 2019	Water Licence
WRSA Instrumentation Location 4	September 19, 2019	Water Licence
Water Licence Amendment Appn – A21 Underground	November 18, 2019	Water Licence
AEMP Design Plan Ver.5.1	November 26, 2019	Water Licence
WRSA Cover Modification Request	January 9, 2020	Water Licence
Water Management Plan Ver.15	January 15, 2020	Water Licence
ICRP Version 4.1 (Pre-conformity check)	February 20, 2020	Water Licence

Continued on next page

TECHNICAL DOCUMENTS EMAB RECEIVED FOR REVIEW IN 2019-20 CONTINUED

Report Name	Date Received	Regulatory Instrument
Engagement Plan Ver. 3.0	March 24, 2020	Water Licence
Draft Terms of Reference, Independent Review Panel for Water Quality Modelling – PK to Pits Project	March 30, 2020	Water Licence
Type 'A' Water Licence (Annual, 2019)	March 31, 2020	Water Licence
WMP (Annual, 2019)	April 8, 2020	Environmental Agreement
AEMP (Annual, 2019)	Not received	Water Licence

ENR LEGISLATION UPDATE

EMAB has reported on two legislative initiatives by GNWT's Department of Environment and Natural Resources (ENR) that started in 2017:

- Changes to the Waters Act as it relates to Diavik's water licence; and
- Changes to the Environmental Protection Act, including enacting air regulations.

However, in an effort to accommodate the capacity of partner Indigenous governments and organizations the GNWT is currently focused on the 5-Year Review of the Devolution Agreement. When this is complete, ENR will shift focus back to amending the *Waters Act*, *Environmental Protection Act* and developing air regulations. EMAB is concerned about the lack of air regulations and need for changes to the *Waters Act* and encourages ENR to move forward with these initiatives as a priority.



Photo courtesy of Diavik Diamond Mine

AQUATIC EFFECTS MONITORING PROGRAM

Diavik's AEMP (Aquatic Effects Monitoring Program) monitors dust, water quality, eutrophication indicators, sediment quality, plankton, benthic invertebrates, and fish health. Diavik submits many different reports for the AEMP. These include Re-evaluation reports, Design Plans, and Annual Reports. EMAB submits many recommendations on Diavik's AEMP reports. Below is a summary of the highlights. To see the full list of recommendations go to our website: www.emab.ca.

THE ENVIRONMENTAL AGREEMENT AND THE WATER LICENCE

The water licence and the Environmental Assessment both contain requirements for the AEMP. Most of the water licence requirements are more detailed than those in the Environmental Assessment. The WLWB cannot make Diavik meet any of the Environmental Assessment commitments unless they are also in the water licence. In the Environmental Assessment Diavik said it would do its best to involve Aboriginal People in designing monitoring programs, and that all its monitoring programs would include activities to:

- consider TK/IQ,
- establish or confirm thresholds or early warning signs,
- trigger adaptive mitigation measures,
- provide ways to involve each of the Aboriginal Peoples in the monitoring programs, and
- provide training opportunities for each of the Aboriginal Peoples.

EMAB is working with Diavik to help it meet its commitments as described throughout this annual report.

1. 2018 AEMP — WLWB DECISION

EMAB reported on the 2018 AEMP report in the 2018/2019 EMAB Annual Report. At the time of writing last year's report, the WLWB had not made a decision on the 2018 AEMP report. The WLWB approved Diavik's 2018 AEMP report on November 18, 2019. Diavik was required to add an addendum with updated figures. Diavik completed the request and the addendum was also approved by the WLWB.

2. 2019 AEMP

The deadline for Diavik's Annual AEMP Reports is March 31. This year Diavik requested an extension for the 2019 AEMP. The WLWB agreed to grant an extension until April 30, 2019. At the time of writing this report, the 2019 AEMP report had not been released.

3. AEMP DESIGN PLAN VERSION 5.1.

EMAB reported on AEMP Design Plan (DP) 5.0 in the 2018-19 Annual Report. The WLWB did not approve Version 5.0 of Diavik's AEMP Design Plan. In their Reasons for Decision, the WLWB directed Diavik to engage with parties on a number of topics, when developing DP 5.1. Version 5.1 of the AEMP DP was circulated by the WLWB on October 11, 2019. EMAB had North-South Consultants (NSC) review it to identify any concerns with the new plan. GNWT-ENR also submitted recommendations. DFO and ECCC did not comment.

EMAB's concerns with AEMP DP 5.1. are highlighted below:

3.1 POWER ANALYSES

Power analyses measure how well a study can detect changes. As a part of DP 5.1., Diavik conducted power analyses for plankton, benthic invertebrates (i.e. organisms that live on the lake bottom, such as snails), and fish. The power analyses results indicated low power to detect changes.

EMAB is concerned that the monitoring programs for plankton, benthics, and fish do not detect change very well. EMAB's view is that:

- Ability to detect change is important as it indicates the effects of the mine over time.
- High power to detect change is ideal.
- Diavik could improve the strength of the power analysis by increasing sample sizes.

EMAB Recommendation: Given the results of the power analyses, the design of the program should be re-evaluated and modifications should be made to ensure the program is adequately designed to facilitate comparisons to action level triggers (e.g. increasing sample sizes). Reconsideration of the trigger for a Lake Trout health survey should be granted given the results of the power analysis.

WLWB DECISION:

- The WLWB does not think Diavik's power analyses provides confidence in the proposed action levels.
- Diavik is to revert to the Action Levels approved in Version 4.1.
- Diavik is to outline the ways in which the AEMP results may lead to a mercury in Lake Trout survey as part of the 2017 to 2019 Aquatic Effects Re-evaluation Report. Diavik should include the results of its power analysis of Slimy Sculpin mercury concentrations as part of this discussion.

3.2 SLIMY SCULPIN

Slimy sculpin are small fish that live in Lac de Gras. They live near the lakebed and stay in the same place for their entire life cycle. Diavik studies them because they are an indicator species, which means they may give a sign of effects that could be happening to larger fish, such as lake trout.

WHAT IS AN ACTION LEVEL?

Diavik has a "Response Framework" as part of the AEMP. The framework sets Action Levels so that Diavik can detect changes to the environment with enough time to respond before harmful effects occur. Low Action Levels require Diavik to take less action, such as investigating whether there is a trend that might lead to a harmful effect. Higher Action Levels take stronger actions to stop or reverse such a trend. By keeping track of small changes triggered by low Action levels, Diavik can do their best to be ready to mitigate the changes before higher Action Levels are triggered. All Action Levels are set below the threshold for significant negative effects to the environment, so that Diavik can take action before environmental damage is significant or irreversible.

DP 5.1 proposes a number of changes for how Slimy Sculpin will be monitored. Changes that were concerning to EMAB were the removal of variables, such as fish age, from fish health analyses. EMAB made a number of recommendations related to slimy sculpin monitoring:

- **EMAB recommended that Diavik should analyze fish abnormalities (e.g. deformities, erosion, lesions, and tumors) as a part of fish health monitoring.**
- **EMAB recommended that Diavik continue to collect fish age data as a part of fish health surveys.** In EMAB's view, including age data is important because it is needed to see if there are changes in fish survival as the fish get older.
 - › Diavik's rationale for stopping collecting age data is because accurate ages of slimy sculpin are



EMAB Photo

difficult to estimate. Methods for aging sculpin are often inaccurate.

WLWB DECISION:

- WLWB approved removal of the age variable
- WLWB directed Diavik to propose a plan for incorporating fish abnormalities into the WOE (weight of evidence) assessment as part of the 2017 to 2019 Aquatic Effects Re-evaluation Report.

3.3 LAKE TROUT

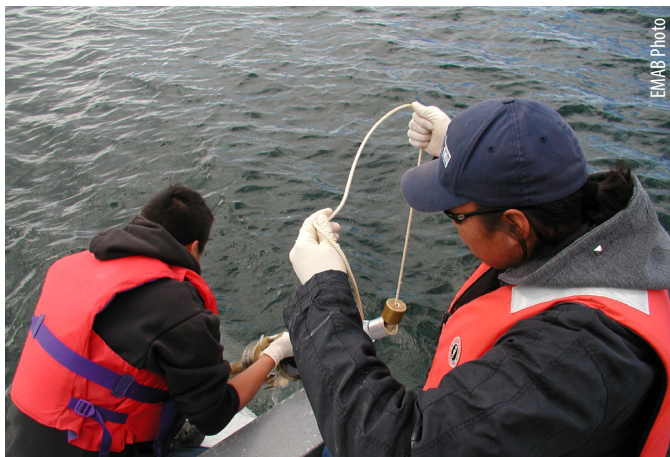
Under DP 4.1. Diavik was allowed to stop regularly monitoring lake trout for mercury. Lake trout are only sampled for mercury if they find mercury in slimy sculpin (i.e. if action level 2 is triggered in slimy sculpin).



EMAB Photo

Diavik did not include action level triggers for sampling lake trout for mercury in DP 5.1. This is concerning to EMAB because we feel that it is important for harvesters to know that the fish are safe to eat. Note: We have included section 4 below to provide additional background on mercury in lake trout and what EMAB is doing about our concerns.

In DP 5.1. Diavik also mentioned a "Lake Trout Mercury Survey". This is not a survey Diavik has mentioned before. Details about this survey were unclear. Methods were not described and it was not clarified how often these surveys would occur, or if they would only occur if mercury in Lake Trout analyses were triggered by slimy sculpin studies.



EMAB recommendations:

- **Clarify the difference between a Lake Trout Health Survey and a Lake Trout Mercury Survey. Clarify the difference between triggers required to initiate a Lake Trout Health Survey versus a Lake Trout Mercury Survey. If the only difference is whether or not the tissue sample is analyzed for mercury, then delete this survey and use same analysis approach as DP 4.1.**
- **Provide a clear description of the triggers that would be applied for requiring a study of mercury in Lake Trout.**

WLWB DECISION:

- Revert to the Action Levels and response actions for Biological Effects as approved in Version 4.1 of the AEMP Design.
- DDMI is to fully consider and outline the ways in which the AEMP results with respect to mercury may lead to a mercury in Lake Trout survey as part of the 2017 to 2019 Aquatic Effects Re-evaluation Report. DDMI should include the results of its power analysis of Slimy Sculpin mercury concentrations as part of this discussion.

3.4 NUTRIENT ENRICHMENT

In DP 5.1, Diavik proposed to add a total phosphorus (TP) benchmark of $10\mu\text{g/L}$. EMAB appreciates the addition of action levels for TP, however the proposed benchmark is concerning because $10\mu\text{g/L}$ is 3 times higher than reference conditions in LdG. Additionally, the Environmental Impact Statement (EIS) has stated the benchmark should be $5\mu\text{g/L}$. Diavik's justification for doubling the benchmark listed in this EIS is that occasionally the TP recorded in LdG exceeds $5\mu\text{g/L}$, and that a normal upper range is $5.3\mu\text{g/L}$. In EMAB's view, occasionally exceeding $5\mu\text{g/L}$ does not justify doubling the benchmark.

In the WLWB's Reasons for Decision, they noted that during the EA, Lac de Gras was considered to be ultra-oligotrophic i.e. very low nutrient levels. The EA benchmark of $5\mu\text{g/L}$ for TP was developed for LdG to protect the ultra-oligotrophic status of the lake.

EMAB recommended that Diavik should retain the previous total phosphorus benchmark of $5\mu\text{g/L}$ or provide better justification for the increase to $10\mu\text{g/L}$. At a minimum, any revised benchmark should not exceed $7.5\mu\text{g/L}$ which represents the mid-point between the upper and lower boundary of the CCME oligotrophic category.

WLWB DECISION: WLWB directed Diavik to set the effects benchmark for TP to $7.5\mu\text{g/L}$.

3.5 WATER SAMPLING STATION CHANGES

In DP 5.0 Diavik proposed stopping comparing near-field to far-field results over time (i.e. spatial extent of effects over the whole lake). Instead, they wanted to evaluate the trends along lines from the near-field to the far-field (i.e. along a gradient).

Reviewers, including the WLWB, EMAB, and GNWT recommended against removing Spatial Extent of

Effects monitoring. As a result, Diavik updated the water sampling design in DP 5.1. to be similar to what was approved in DP 4.1. Diavik will continue comparing near-field and far-field results using Spatial Effects monitoring, as well as doing Spatial Gradient Analysis.

EMAB Recommended that Diavik should provide clarification and discussion of incorporation of results from site LdG-48 (the outflow of LdG to the Coppermine River) in defining the spatial extent of effects.

WLWB DECISION: The WLWB allowed Diavik to remove LdG-48 from yearly spatial effects analyses.

WLWB DECISION ON DESIGN PLAN 5.1: In June 2020, the WLWB released their Reasons for Decision on AEMP DP 5.1. They did not approve the Plan and provided direction for version 5.2. Diavik must continue following Design Plan 4.1. until a new version of the AEMP Design Plan is approved.

4. MERCURY IN LAKE TROUT

Mercury levels in Lake Trout have been variable in LdG since the beginning of mine operations. Occasionally, levels in some fish have been above subsistence consumption limits set by Health Canada. Mercury has not been detected in Diavik's effluent, so it doesn't seem like mercury comes directly from Diavik. Mercury levels in fish in many other lakes in the NWT are also increasing.

In 2008 Diavik started sampling mercury in Lake Trout as a part of the AEMP. They did this because high mercury levels were found in slimy sculpin in 2007. Diavik studied mercury in Lake Trout every three years from 2008-2014.

2014 studies showed that mercury levels were near baseline (ie. how they were before the mine opened). Because of this, Diavik has been given permission to only sample Lake Trout for mercury if slimy sculpin show effects.

EMAB disagrees with this program change. We continue to have concerns about mercury levels in Lake Trout because Diavik doesn't routinely sample them.

4.1 TK FISH CAMP: FISH PALATABILITY

Diavik currently documents mercury concentrations in some Lake Trout caught at TK camps. The AEMP TK Fish Camp takes place every third summer. Youth and Elders from affected communities attend the camp to taste fish and water from LdG, and to inspect fish for cysts and parasites. Diavik also takes tissue samples and analyzes them for mercury and other metals in Lake Trout. Although this provides some indication about mercury levels, the data are not collected scientifically. This makes it difficult to compare results and analyze trends between years.

None of the fish harvested at the 2018 TK Fish Camp had mercury levels that exceeded the guidelines set by Health Canada.

4.2 EMAB MERCURY IN LAKE TROUT ANALYSIS

EMAB has not succeeded in our recommendations to Diavik or the WLWB about resuming mercury sampling in Lake Trout, so in 2020 EMAB decided to do its own study of the data on mercury in Lake Trout in the Diavik area.

The goal of the analysis is to see if there are trends in the mercury data that have not been identified by Diavik. EMAB plans to report on the Lake Trout Mercury analysis in our 2020/2021 Annual Report.

SPILL REPORT FOR DIAVIK DIAMOND MINE 2019-20

(GNWT DATABASE)

Spill No.	Date	Commodity	Quantity	Source
2019251	June 22, 2019	Hydraulic oil	240L	Truck
2019379	Sept 14, 2019	Hydraulic oil	250L	Truck
2019421	Oct 12, 2019	Raw pit-water	unknown	Pipeline
2019435	Oct 21, 2019	Fuel	280L	Fuel tank
2019484	Dec 15, 2019	Wastewater (sewage and tailings)	250L	Storage tank
2020014	Jan 15, 2020	Hydraulic oil	200L	Other transportation
2020017	Jan 19, 2020	Hydraulic oil	540L	Other transportation
2020041	Feb 10, 2020	Hydraulic oil	600L	Truck
2020066	March 2, 2020	Glycol	250L	Storage tank
2020078	March 13, 2020	Rust inhibitor	250L	Drum or barrel

UNDERGROUND SPILLS:

The number of underground spills is still lower than it was before 2016, but rose this year after a low number in 2018. These spills are considered to have an effect on the hydrocarbon contamination in sediments in the North Inlet.

Volume and Number of Underground Hydrocarbon Spills							
2016		2017		2018		2019	
Liters spilled	# of spills	Liters spilled	# of spills	Liters spilled	# of spills	Liters spilled	# of spills
2696L	163 spills	1850L	94 spills	1385L	113 spills	1955L	121 spills



Photo courtesy of Diavik Diamond Mine

PK TO MINE WORKINGS PROJECT PROPOSAL: WATER LICENCE AMENDMENT AND ENVIRONMENTAL ASSESSMENT

Diavik applied to amend their Water Licence in June 2018 to dispose of Processed Kimberlite (PK) in the mine pits, instead of the Processed Kimberlite Containment Facility (PKC). The project is called the PK to mine workings (PKMW) Project. EMAB supports putting PK in the pits, as long as it is done in a way that does not cause harm to the environment.

The Mackenzie Valley Environmental Impact Review Board (MVEIRB), referred the proposal to Environmental Assessment. Public Community hearings for the assessment took place in Behchokò and Dettah from September 3-4, 2019. Public Technical hearings took place in Yellowknife on September 5-6, 2019. At the hearings, Diavik, community members and intervening organizations made presentations about the concerns

they had about the PKMW Proposal.

EMAB has been involved with the entire review, including participating as interveners at the hearing, and attending technical sessions and pre-hearing conferences. You can find a full summary of EMAB's intervention for the PKMW project in our 2018/19 annual report. The key issues that EMAB raised at the hearing were:

- Uncertainties in water quality modelling and the need for more accurate modelling, and independent review of the modelling results
 - › Diavik predicts the top 40m of water will be safe for fish, and that fish won't swim below 40m. EMAB is concerned that fish will go below the top 40m of water.
- Concern about whether the pit lake can be reconnected to LdG, and the need for both scientific and TK-based criteria.
- The need for comprehensive monitoring of the pit lake before reconnecting with LdG, and after.
- The proposal did not include removal of slimes from the PKC. EMAB's view is that moving the slimes from the PKC to the mine pit would be a better closure



option than leaving the slimes in the PKC where they are a hazard to wildlife.

EMAB'S CLOSING ARGUMENTS:

The purpose of closing arguments is for intervenors to state their final views of the proposal and make recommendations on measures and suggestions to MVEIRB. EMAB submitted closing arguments on September 27, 2019.

EMAB does not believe disposing PK in the pits will result in significant adverse effects if key mitigation measures are in place:

- meet CCME (Canadian Council of Ministers of the Environment) guidelines for water quality and the protection of aquatic life in the pits
- maintain suitability for traditional use
- closure objectives and criteria must be approved before depositing PK
- validation of the water quality model and results
- annual progress reporting on fulfillment of measures and suggestions

EMAB also made suggestions for consideration for MVEIRB, including:

- Diavik to investigate feasibility of relocating extra-fine PK from the PKC to the pits.
- MVEIRB to make a recommendation for a permanent participant funding program.

MVEIRB'S DECISION:

MVEIRB released their Reasons for Decision on the EA on January 6, 2020.

The main finding in the Reasons for Decision was that significant impacts to water quality and cultural use are likely to occur without further mitigation. MVEIRB prescribed measures required for mitigation and made suggestions.

Measures prescribed:

- Diavik will meet water quality objectives at closure.
 - › Objectives: safe for people, aquatic life and wildlife, and suitable for cultural use.
- Diavik will update water quality models.
- Diavik will establish an Independent Review Panel for water modelling.
- Diavik will work with Indigenous groups to develop cultural criteria for deciding if the pit lakes can be re-connected to LdG.
- Diavik will conduct more effective engagement with potentially affected communities.
- GNWT will manage cumulative impacts on cultural well-being.

Suggestions:

- Diavik should conduct a study on the possibility of moving slimes from the PKC to the pits.
- GNWT should coordinate cultural and socio-economic requirements of the PKMW project with the Ekati-Jay project.

- GNWT should support improving community-based monitoring of impacts to cumulative cultural well-being.

EMAB is generally supportive of the measures and suggestions determined by MVEIRB.

MINISTERS DECISION:

In June 2020 the Minister approved the measures MVEIRB developed. The next step is the WLWB Water Licencing Process.

PROPOSED TERMS OF REFERENCE (TOR) FOR DIAVIK'S INDEPENDENT REVIEW PANEL FOR WATER QUALITY MODELLING:

One of the measures prescribed by MVEIRB is that Diavik will establish an Independent Review Panel for water quality modelling. On March 30 2020 the WLWB released Diavik's proposed TOR for the Panel for public review. EMAB submitted nine recommendations. GNWT declined to comment before the deadline because the Minister had not yet released a decision on the PK to Pits proposal. Tłıchǵ Government also submitted comments. WRRB, ECCC and DFO did not submit comments.

EMAB and others raised a concern that the Minister had not made a decision on the PKMW Project when the draft TOR were circulated.

EMAB recommended the Review Panel should have at least three members to ensure an effective range of expertise. EMAB made a number of recommendations intended to make sure the Panel was independent of Diavik.

WLWB DECISION: The WLWB approved Diavik's Review Panel TOR, but required a new version with some changes. Some highlights from the WLWB directions are:



Pit A418.

- The Panel will have at least three members.
- The Panel will be independent of Diavik, WLWB, and all other Parties.
- The Panel will work to achieve consensus among the members.

A21 DEEP PROPOSAL: WATER LICENCE AMENDMENT

In November 2019, Diavik requested another amendment to their Water Licence to allow Diavik to mine underground at the A21 pit. The A21 pit was opened in late 2018. Diavik is still mining the surface of A21.

EMAB does not have major concerns with the project proposal because it is similar to the underground mining currently happening at pits A418 and A154. EMAB provided comments on the amendment application, and attended technical sessions to raise outstanding questions. ECCC, DFO, and ENR-Waters also made comments on the amendment application.

WHAT IS MEROMIXIS?

Meromixis is a condition in a lake where two different layers form. Usually this has to do with salts in the water. The salty water is heavier and forms a layer on the bottom of the lake, or pit. Modelling shows that after closure, the pit lakes at Diavik will become meromictic for a time, although they will eventually mix, over decades.

EMAB had a few questions about the amendment proposal. EMAB hired Slater Consulting to help with our review of the A21 underground proposal. A summary of EMAB's recommendations is below:

- Diavik should update security estimates to include mining underground at A21.
 - › Diavik will do this through ICRP 4.1
- Modelling shows that there is a risk of poor water quality in the pit-lakes after the mine closes. Diavik should update these models.
 - › Diavik disagreed, saying that underground mining would reduce the risk of poor water quality by increasing meromixis.

Because there were no major concerns after Diavik responded to all the recommendations, EMAB decided not to intervene in the hearings. GNWT submitted a recommendation to provide data on quantity and quality of water pumped from the A21 pit. Diavik accepted the recommendation and as a result it was agreed there was no need for a public hearing and it was cancelled. A draft water licence was circulated and EMAB reviewed it and did not have any concerns or comments. The WLWB is expected to make a decision on the amended licence in August 2020.

DIAVIK COMMUNITY ENGAGEMENT PLAN VER. 3.0

Engagement plans are required by Diavik's water licence. MVEIRB required Diavik to address engagement with communities as a mitigation measure for the PKMW proposal (see p. 28). Version 3 of Diavik's Engagement Plan was released for review on March 6, 2020. EMAB reviewed the plan and submitted comments to the WLWB on April 8, 2020. Tłıchǫ Government also submitted comments. GNWT declined to comment by the deadline because the Minister had not yet released their decision on the PK to Pits proposal. WRRB, DFO, and ECCC did not submit comments.

EMAB's concerns with Engagement Plan 3.0 include:

- Diavik chose to use a different approach than what is required by the MVLWB guidelines for engagement, for many parts of the Plan.
- Diavik did not include reporting of issues resolved and issues unresolved during engagement in communities. This is required by the MVLWB guidelines.
 - › EMAB's view is that reporting on resolved and unresolved issues helps reviewers understand where consensus and/or agreements were made, and what areas resulted in disagreements.
 - › Diavik should also include a section that discusses the process for resolving concerns during engagements.
- The Plan says that face-to-face meetings are not necessary for engagement.
 - › EMAB's view is that in-person communication is required for engagement to be meaningful.
- Diavik's Engagement Plan lists the frequency of engagements as 'variable'.
 - › EMAB's view is that Diavik should commit to engage with each party at least once per year.

- Details on engagements are minimal in previous versions of the ICRP. The updated Engagement Plan is more detailed but does not include any greater commitments for engagement reporting in closure plans.
- Diavik listed ‘technical meetings’ as a form of community engagement.
 - › Technical meetings are created for technical experts. They are not accessible to the general public because technical experts use scientific jargon, not plain-language.
 - › EMAB’s view is that technical meetings are not a useful way to engage with communities.

WLWB DECISION:

The WLWB approved Version 3 of Diavik’s Engagement Plan on May 8, 2020. They provided direction for Diavik to follow for the next version of the Plan. WLWB’s directions are similar to EMAB’s concerns:

- Diavik must include summary tables of resolved and not resolved issues.
- Diavik must list face-to-face meetings as the primary form of engagement.
- Diavik must commit to meet with communities once every year.
- Diavik must include indigenous language reports, community meetings, workshops, technical meetings, and written comments as primary methods of engagement for Water Licence Amendments and amendments to other Environmental Plans.
- Diavik must address comments submitted by the Tłıchǫ Government.

CLOSURE AND RECLAMATION PLANS

Diamond mining disturbs the landscape and produces large amounts of waste. Diavik’s Interim Closure and Reclamation Plan (ICRP) provides detailed information about how Diavik plans to reclaim the land to be as close to its original state as possible. Diavik continues to update its ICRP’s with more details and following direction from the WLWB. Diavik’s water licence requires that a Final Closure and Reclamation Plan be approved no later than 2022.

Diavik works with a Traditional Knowledge Panel to seek TK input on closure plans. The Panel’s recommendations can be found on the EMAB website: www.emab.ca.

1. ICRP VERSION 4.1

Diavik submitted ICRP Version 4.1 to the WLWB in December 2019. The WLWB decision on ICRP Version 4.0 required that Diavik provide much more information and make many changes, and to submit the revised report by June 2019. Diavik requested an extension to December 2019, which was accepted.

The WLWB reviewed the plan and required Diavik to make several more changes so that the plan conformed with WLWB direction from ICRP 4.0. The revised version was circulated for review on May 13, 2020 and comments are due by September 15, 2020.

Diavik has also submitted new security estimates based on the revised plan, as well as progressive reclamation done on the North Waste Rock Storage Area (NWRSA).

Diavik has made a number of significant changes in ICRP 4.1, which are improvements from EMAB’s perspective.

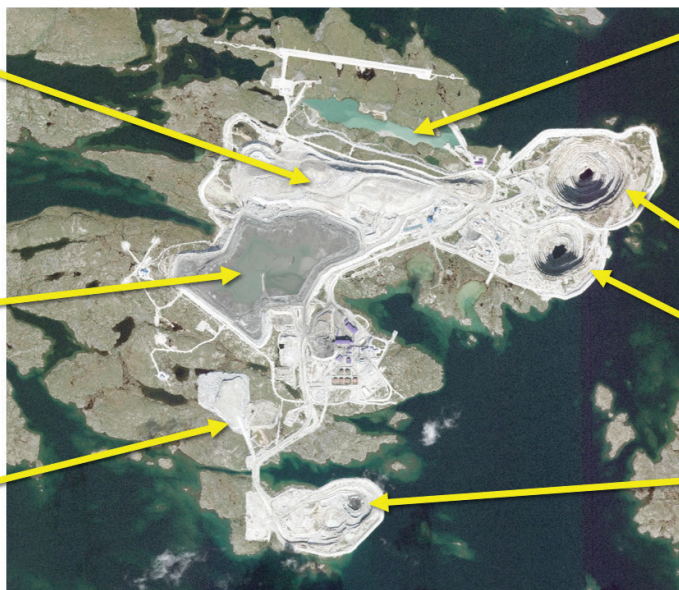
EMAB began its review of ICRP 4.1 in February of 2020, before circulation of the revised report that met WLWB

Diavik Mine Site 2019

North Waste
Rock Storage
Area

Processed
Kimberlite
Containment
Facility

South Waste
Rock Storage
Area



North Inlet

Open
Pits
A154
A418
A21

conformity requirements. EMAB would have preferred to wait until the WLWB officially circulated the conforming document; however Diavik indicated it would not agree to roll over funds allocated to review the ICRP in the 2019-20 fiscal year. The Board considered it fiscally prudent to use those funds to start the review while they were available.

EMAB is in the process of reviewing ICRP 4.1 so final recommendations are not available. Once the Board has formally approved the recommendations they will be submitted to the WLWB. The WLWB will consider the input from all the commenters and make a decision on ICRP 4.1.

This section looks at the main areas that EMAB was concerned about in ICRP 4.0, whether they have been addressed in ICRP 4.1 and any additional comments on ICRP 4.1 in these key areas.

1.1 NORTH WASTE ROCK STORAGE AREA (NWRSA)

Diavik has proposed to cover the NWRSA as a way to keep the pile underneath frozen, and prevent any contaminated runoff or seepage. Diavik has done extensive modelling of the expected performance of the cover for the next 100 years, and if the cover does what the model shows, the pile will stay frozen. EMAB continues to have concerns about the performance of the cover, both during the first 100 years as well as after the period Diavik has modelled. If the cover does not perform adequately it is possible that contaminated water will flow off the pile, across the land and into Lac de Gras. EMAB wants Diavik to do a study on the performance of the NWRSA and cover beyond 100 years. EMAB also wants Diavik to model water quality if the cover thaws and the rock underneath also begins to thaw.

WHAT IS TILL?

Till is sediment that was deposited by glaciers a long time ago. The till Diavik is using to cover the WRSA comes from the A21 pit. This till was also covered up by Lac de Gras before Diavik took the water out of A21.

EMAB Photo

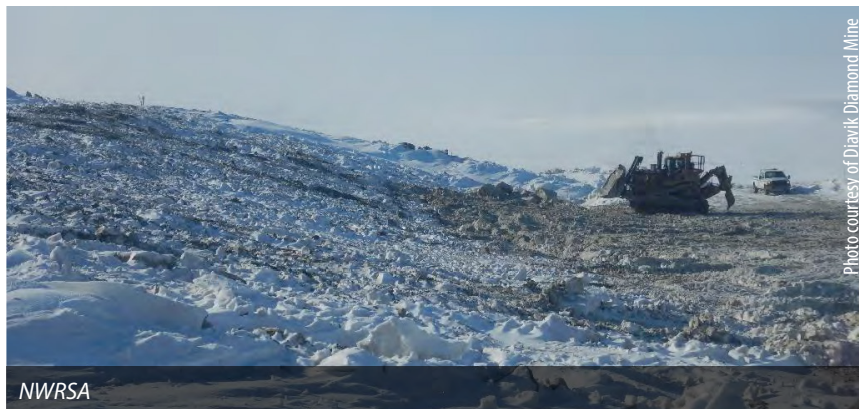


Photo courtesy of Diavik Diamond Mine

NWRS



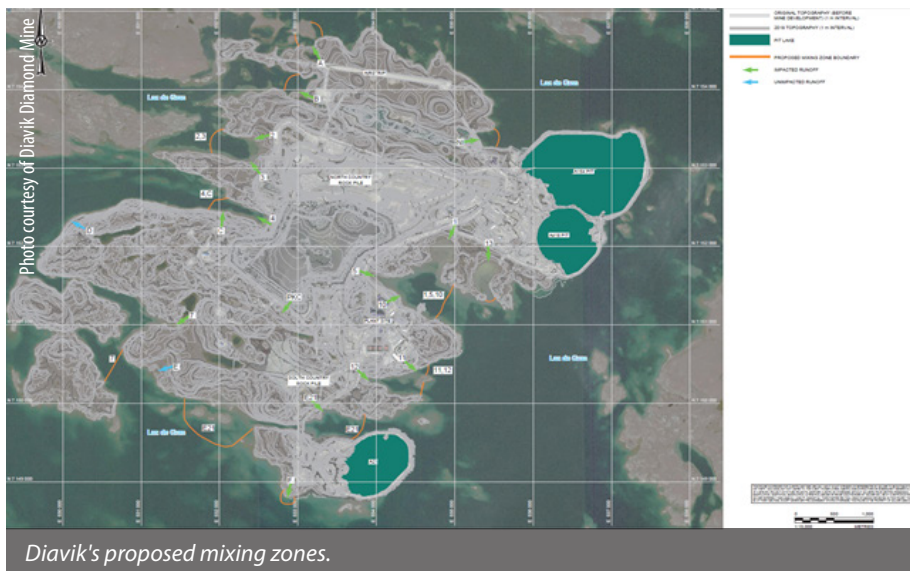
EMAB Photo

Re-sloping

Diavik has been working on the NWRS cover since 2017. This includes re-sloping the pile to ensure the cover will be stable, placing a 1.5-metre layer of till (mostly from the A21 pit) over the pile, and placing a 3-metre rock layer over top of the till. As of the end of 2019 Diavik had:

- Re-sloped 62% of the pile
- Placed 29% of the till layer
- Placed 2% of the rock cover

We note with some concern that almost 90% of the 2018 quality control samples of the till had moisture less than the minimum amount required by the engineered design, and built into the model. EMAB wants Diavik to model the performance of the cover at moisture contents that reflect the results of sampling and predict how much additional waste rock might be required to keep the cover frozen. This amount should be included in the security estimate contingencies.



1.2 RUNOFF AND SEEPAGE WATER QUALITY

Diavik has done extensive modelling of runoff from the East Island to Lac de Gras, especially in relation to concentrations of contaminants. This information has allowed them to identify several mixing zones where contaminated water will run off the island, following existing streams. Diavik predicts there will be 15 mixing zones of various sizes totaling about 237 hectares, or 2.37 square kilometres. The largest mixing zones are for the catchments receiving runoff and seepage from the PKC and the North and South Waste Rock Storage Areas. EMAB wants Diavik to confirm that the drainage patterns they have used for their predictions are accurate.

In ICRP 4.0 Diavik had proposed a one-kilometre ring around the entire East Island as the mixing zone, or about 25 square kilometres. EMAB had said the proposed mixing zone was unacceptable.

The modelled mixing zones in ICRP 4.1 total less than one-tenth of the area in ICRP 4.0. The 15 mixing zones range from 100 metres to 1,800 metres with an average of about 560 metres. MVLWB sets a maximum radius of 100 metres for a mixing zone, so most of these are much bigger.

Diavik has said that none of the mixing zones include critical fish habitat, and that there will not be lethal levels of contaminants anywhere in the mixing zones. Clarification will be required about

the water quality predicted to run off the NWRSA if the cover does not perform as predicted, including the potential for toxic contamination to enter Lac de Gras. EMAB wants Diavik to explain how they will monitor the size of the mixing zones.

1.3 WILDLIFE SAFETY

EMAB raised a number of issues related to wildlife safety in our review of Version 4.0:

1.3.1 HARM FROM ROUGH SURFACES

EMAB was concerned that caribou or other animals could hurt themselves in areas where there are steep or rocky surfaces, particularly on the WRSA's. The WLWB directed Diavik to commit to continue working with elders, communities and the TK Panel to ensure the surface of the WRSA's is safe. Diavik has included this commitment in ICRP 4.1. Diavik has also specifically committed to include Traditional Knowledge input in the assessment of WRSA surfaces, and to involve community members in the assessment during and following closure.

EMAB CONCERNS:

- The description provided for closure of the SWRSA does not sufficiently address wildlife safety issues and only includes one ramp for caribou access (see SWRSA section below).

- Parts of the NWRSA that do not contain Type II or III rock will not be re-sloped.

1.3.2 HARM FROM DRINKING CONTAMINATED WATER

This concern was not directly addressed in the WLWB decision on ICRP 4.0.

This concern is addressed under Site-wide closure objective 1: surface runoff and seepage water quality that is safe for humans and wildlife:

- Diavik has said that it will sample runoff and seepage where human/wildlife consumption is likely, and has proposed minimum water quality standards based on CCME guidelines for livestock, and Site-Specific Risk-Based criteria for human drinking water.
- EMAB has a number of questions about the proposed criteria for safe human and wildlife water consumption.

1.3.3 HARM FROM EATING CONTAMINATED VEGETATION

This concern was not directly addressed in the WLWB decision on ICRP 4.0.

Diavik has addressed this concern under objective SW4: Dust levels do not affect palatability of vegetation to wildlife. They will monitor Permanent Vegetation Plots, including metals analysis, every five years. These plots do not include the revegetated areas.

EMAB has some questions and concerns about how wildlife will be protected from eating contaminated vegetation.

- Diavik has not proposed criteria for contamination in vegetation.
- Diavik hasn't said whether it plans to sample vegetation in revegetated areas for metals and other contamination (such as hydrocarbons), and whether

they will sample for a long enough period of time to

ensure contamination is not being taken up by plants.

- Lichen samples on site already contain a number of contaminants.

1.4 NORTH INLET

The WLWB directed Diavik to consider all possible options for closure of the North Inlet (NI). They also directed Diavik to engage with reviewers about whether to remove the objective of reconnecting the NI with Lac de Gras.

While water quality in the North Inlet is acceptable, the main concern is contamination of the sediment with hydrocarbons, which does not meet requirements for aquatic health. Diavik's research shows that the bacteria in the sediments will eat the hydrocarbons in the sediment over time, and would likely reduce the amount by half over ten years.

Diavik has removed the closure objective of reconnecting the NI with Lac de Gras, while saying this option is still possible. Diavik is proposing that if the North Inlet sediments do not meet aquatic health requirements within 10 years they will breach the dike that separates it from Lac de Gras and fill the breach with rocks that will allow water to flow in and out but prevent any fish from getting in. If the sediment quality improves enough within the ten-year period they will open the dike so fish can move in and out.

EMAB would like Diavik to continue monitoring the sediment past 10 years. If the sediment eventually meets aquatic health requirements, Diavik should breach the dike to allow fish to use the NI.

1.5 CONTAMINATED SOILS

By the time the mine closes Diavik expects to have about 1,500 cubic metres of hydrocarbon contaminated soil stored on site. In response to ICRP 4.0 the WLWB directed that Diavik engage with parties on disposal of contaminated soils.



Waste Transfer Area.

In ICRP 4.1. Diavik is proposing to treat the soil with the target of meeting CCME Agricultural standards, but with the minimum requirement being that the contaminated soil would not contaminate material next to it. If the soil meets agricultural standards it could be used in revegetation; otherwise, it would be buried in permafrost. If it did not meet minimum limits it would be shipped offsite.

EMAB's stated view is that hydrocarbon contaminated soil should be treated at site and if it does not meet CCME Agricultural Standards after treatment it should be shipped offsite.

1.6 REVEGETATION

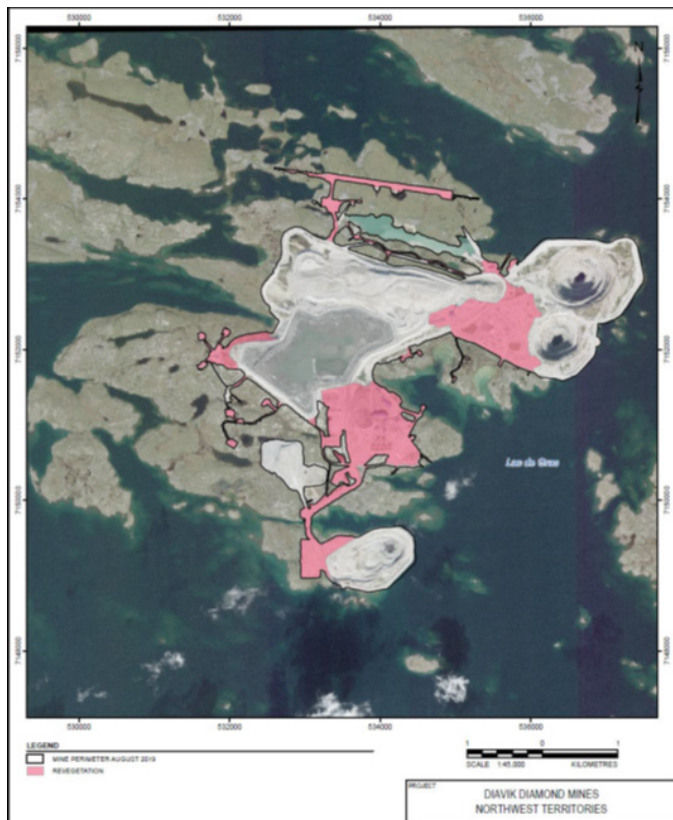
The WLWB directed Diavik to engage with communities and other reviewers on revegetation of the WRSA and advised them to consider revising the closure objective based on the engagement.

Diavik has increased the size of the area they propose to revegetate from about 11% of the disturbed area to about 18%. This is an improvement but still much less

than the 65-70% vegetated area that existed before the mine was built. EMAB also noted that Diavik's security estimate for revegetation only covers 11% revegetation, so should be increased to cover costs of revegetation of the full area proposed. Diavik has said it will provide a Revegetation Design Report in early 2021 as part of the 2020 Annual Closure Progress Report.

EMAB has said that Diavik should target revegetating the minesite to the same level as before development of the mine ie. 65-70 % vegetated, including some vegetation on the NWRSA. We also referenced recommendations from the TK Panel to provide some vegetation on the NWRSA.

Diavik's proposed revegetation does not follow the methods recommended by the multi-year study they commissioned from the University of Alberta (U of A). The study recommended establishing revegetation islands using crushed rock with added nutrients and organic matter, but Diavik has only proposed to scour the ground in some areas and apply native grass seed.



Pink areas are proposed areas for revegetation.

The U of A study notes that in the conditions found at Diavik, natural revegetation could take 100's to 1,000's of years. EMAB would like Diavik to make a greater effort to plan for success of its revegetation by following the U of A guidance.

EMAB also notes that Diavik has said it would prefer not to re-seed if their first effort at revegetation fails. EMAB disagrees: it is Diavik's responsibility to make sure the revegetation succeeds.

1.7 CLOSURE CRITERIA INCLUDING SITE-SPECIFIC RISK-BASED CRITERIA

Diavik has done a great deal of work on the proposed closure criteria and Site-Specific Risk-Based Criteria (SSRBCC) since Version 4.0. Many of them now measure outcomes and performance, something EMAB has strongly advocated for. EMAB still has comments on several of the proposed criteria that will need to be addressed, including revegetation, clarity on expected performance of designs, and matching the shape and appearance of the surrounding area. The WLWB has not yet approved any of Diavik's closure criteria.

EMAB was pleased to hear from ENR that it is gathering information that will inform its wildlife related comments on the closure plan.

Diavik submitted another revision of its SSRBCC report in April 2019. EMAB asked Arcadis Canada, our technical consultants, to review the revisions and provide comments. Arcadis felt most of the changes were acceptable, but recommended that EMAB not accept the SSRBCC related to protection of aquatic life (fish, invertebrates, aquatic vegetation) since these did not follow CCME guidelines for development of SSRBCC. Instead Diavik should follow CCME Guidelines for the Protection of Aquatic Life.

1.8 PROCESSED KIMBERLITE CONTAINMENT FACILITY

The Processed Kimberlite Containment Facility (PKC) closure plan is the least developed and most problematic and risky part of the closure plan. Based on the information available, EMAB has concluded that Diavik still does not have a credible plan for closing the PKC. Diavik has been proposing a "wet cover" approach, but is now also researching a dry cover option. Diavik says they want to analyze both options in detail, which means a lot more design and engineering work needs to be done before they can choose the best option. Diavik is

WHAT IS THE PKC FACILITY?

The PKC Facility is where Diavik's tailings are dumped after the diamonds are taken out of the kimberlite. The tailings (called fine processed kimberlite or PK, similar to sand) are over 40 metres deep and are contained in a dammed area. There is a pond located near the center of the PKC that changes size depending on the time of year and the mine's activities. There is a thick layer of very fine PK under and around the pond that is like quicksand. It is also called slimes. Any person or animal walking on it would sink in.

proposing to submit a PKC Closure Design in early 2021 as part of the Annual Closure Progress Report. Diavik will not be able to do field trials to test the design until the PKC pond has been drained.

Following review of Version 4.0 of the ICRP the WLWB directed Diavik to:

- Update water quality predictions for the outflow from the PKC, as well as seepage;
- Identify research needed to address uncertainties in the plan;
- Clarify whether slimes would be removed if Diavik is approved to place PK into the open pits; and
- Provide a schedule to ensure PKC closure planning stays on track as deadlines for the final closure plan approach.

EMAB wants Diavik to:

- Complete a feasibility study for removing the slimes from the PKC; or

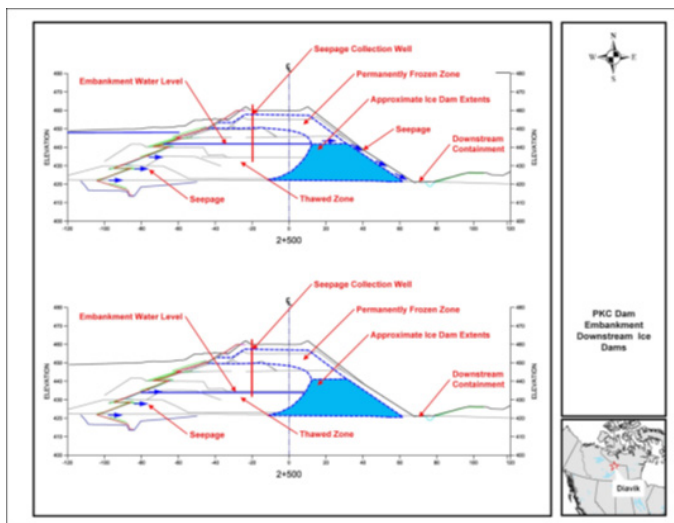
- Propose a method to apply a dry cover over the slimes; or
- Demonstrate that the current plan with a pond in the middle can be built and remain stable.

1.8.1 WET COVER

The currently approved approach is a wet cover, where Diavik would cover the slimes with a pond, surrounded by a rock cover over the rest of the tailings. There would be a spillway leading to LdG for any overflow. The tailings would be covered with a layer of geotextile fabric, with a layer of waste rock on top as the cover. Diavik says this rock layer would go right up to the edge of the pond and be safe to walk on. The pond would protect wildlife from being caught in the slimes. There are a few key problems with this plan:

- If the slimes are exposed they could be very dangerous for people or animals to walk on.
- A lot of water seeps out of the PKC through the walls of the dam, so it will be very difficult to keep a pond over the slimes after the processing plant stops pumping tailings into the PKC.
- Diavik has not shown that the pond will not dry up over the long term.
- The slimes will not support a rock cover, and it is not clear how Diavik will be able to build the rock cover up to the edge of the pond.
- It is not clear how a wet cover would be monitored over the long-term.

Another concern is that some of the water that has been seeping out of the PKC has frozen inside the dam at its outer edge. There is an area behind this ice dam where water is trapped inside the dam. Right now, Diavik has pumps inside the dam that remove this water, but once the mine closes and pumping stops the water will build up. This could weaken the dam, making it unstable.



PKC Dam Embankment.

Diavik still needs to do a lot of research and field trials to show that the wet cover option can work. Given these uncertainties they should include a higher contingency in their security deposit.

1.8.2 DRY COVER AND REMOVAL OF SLIMES

Diavik has also proposed the possibility of a dry cover for the PKC. This would involve draining the pond and covering the entire PKC with a layer of rock over geotextile fabric. Diavik has said that they will need to do field trials to test this option, and for that to happen they will need to have finished putting PK into the PKC, and have started dewatering it. Diavik has applied to amend their Water Licence to allow PK to be disposed into one of the open pits once mining of that pit has been completed (see pages 28-30). This might allow the field trials to start sooner.

EMAB has been pushing for Diavik to move the slimes in the PKC into the open pit as part of the amendment.

Moving the slimes would make a dry cover option for the PKC more workable.

1.9 SOUTH WASTE ROCK STORAGE AREA (SWRSA)

Diavik has not prepared a closure plan for the SWRSA and has only included a rough estimate of \$4,000 in closure costs in the plan. EMAB considers this amount inadequate. The plan should include some shaping of the pile, including safe access for caribou and other animals, and some revegetation. Diavik says they do not plan to do any closure work on the pile except for building a caribou ramp. They say they are waiting for a better idea of the amount of rock and till that will be in the pile before submitting a plan.

EMAB's view is that the closure plan for the SWRSA must meet all the closure criteria: safe passage and use for caribou, physically stable and safe for use by people and wildlife and a shape and appearance that is similar to the surrounding natural areas. EMAB wants Diavik to prepare a plan based on best estimates, and meeting these criteria, so we can review it. Diavik has said it will provide a South Waste Rock Storage Area Report in early 2021 as part of the 2020 Annual Closure Progress Report, and that it does not plan to do any grading or revegetation on the pile.

1.10 LONG TERM MAINTENANCE AND MONITORING

Diavik has provided much more detail on its post-closure long-term maintenance and monitoring plans since ICRP 4.0. The previous commitment to seven years of monitoring has been extended to include closure monitoring from 2026 to 2030, and post-closure monitoring which continues to somewhere between 2040 and 2050 (see table of Proposed End-Date and Frequency for Post-Closure Monitoring Components).

Proposed End-Date and Frequency for Post-Closure Monitoring Components

Program	Date	Frequency
AEMP	2050	Every 3 years to 2037, then every 6 years to 2049
Geotech	2050	Every year to 2032, then every 3 years to 2050
Wildlife	2041	Report every year to 2035, then every 3 years to 2041 (varies by component)
Vegetation	2040	Every year from 2026 to 2032, then 2036, then 2041
SNP	2040	(varies by station)
Dust	2032	Every year from 2025 to 2032
Soils	2030	Every year from 2025 to 2030

Closure monitoring will take place as work progresses to close the various mine components. Once they are closed Diavik has said they will develop a baseline for each component to compare with post-closure monitoring results.

Diavik has committed to including communities in doing both scientific and TK monitoring. Diavik has said it will finalize planning for closure monitoring by 2021, including qualification requirements for monitoring personnel.

Diavik has also committed to develop a TK-based long-term monitoring program in consultation with the TK Panel and the Affected Communities. Diavik did not provide details on the process for engaging with TK holders, designing the plan or how it will be implemented. An important consideration is how the TK monitoring will be used in assessment of fulfillment of closure criteria.

EMAB has some concerns about the proposed closure and post-closure monitoring:

- The frequency and duration of the monitoring programs should be driven by the monitoring results, not a set schedule as proposed by Diavik.
 - › Runoff and seepage from the WRSAs may take many years to develop.

- » Post-closure SNP monitoring should not be reduced until the site is shown to be stable and there is a strong dataset.
- › Monitoring of the North Inlet sediments should continue until it is shown that they are safe for aquatic life, or that they will not remediate to the point where they are safe.
- › Revegetated areas should be monitored for a long enough period to show that the vegetation has become established, and has not taken up contamination from the soil.
- › Wildlife monitoring should continue long enough to show criteria have been met. It will take a few years for wildlife to return to the area after closure activity is completed.
- There should be more than one North Inlet monitoring station.
- Consider continuing to operate PKC seepage wells to monitor seepage quality and quantity.
- Monitoring of dam stability and the NWRSA cover should continue for their lifetime.
- Drainage structures for the PKC should be inspected after any extreme weather events.
- TSP monitoring of air should continue through closure.

GNWT-Lands has been working on a policy on security for mine closure along with the Land and Water Boards. They have updated the Public Lands Act and will develop regulations covering leases, security adjustments, relinquishment of security, and reclamation standards. They plan for the regulations to be transferrable to the Waters Act. They are not working on long-term liability right now. EMAB encourages GNWT to make legislation on long-term liability and associated costs a priority.

1.11 SECURITY

Security must cover the full cost of closing the mine. GNWT holds security for the Diavik Mine. Security is closely linked to closure planning. Once Diavik meets the closure criteria for a part of the mine, they can request a refund of security for that part.

Security for Diavik is held under the water licence, land leases and the Environmental Agreement. The total security held for Diavik is about \$171 million as follows:

- \$142 million under the water licence (amount set by WLWB)
- \$11 million under surface leases (amount set by GNWT – Lands)
- \$17 million under Environmental Agreement (amount set by GNWT)

The security is used only if Diavik is unable to meet its commitments to close all or part of the mine. Once Diavik closes a part of the mine satisfactorily to GNWT, the security for that part can be refunded to Diavik. Part of the security may be held back for long-term maintenance and/or monitoring costs until GNWT is satisfied that the closure is working properly.

Security is set using a calculator called RECLAIM. When the amount of security is being set, Diavik and GNWT try to reach an agreement on the amount. Then all parties

can make comments to the WLWB. The final decision on the amount of security for the water licence is made by the WLWB. Diavik and GNWT mostly agree on the security estimate for Version 4.1 but not on everything. One of the concerns is about holdback amounts for long-term maintenance at the mine. They will each make recommendations to the WLWB and the board will make the final decision.

Security can be reviewed, and possibly adjusted, by a request from Diavik, EMAB or another party, or by WLWB or GNWT. Recently Diavik has requested security be adjusted to account for work they've done on the NWRSA; this will also be considered through the ICRP 4.1 review.

EMAB's view is that the proposed security for ICRP 4.1 has some deficiencies:

- Estimate for closure of the SWRSA.
- Contingency to move slimes from the PKC to allow for PKC closure.
- Contingency for additional cover on the NWRSA if modelling shows the current cover will not keep the rock frozen.
- Cost for a TK monitoring program.
- Contingency for long-term monitoring if proposed frequency or duration needs to be changed.
- Use of likelihood ratings to adjust holdback amounts for NWRSA, PKC and Revegetation.
- Cost for the contingency of water treatment has been calculated, but is not included in the security estimate, at the direction of the WLWB. Some portion of this cost should be included in the closure estimate.

2. INSTRUMENTATION OF NWRSA

The WLWB required Diavik to propose locations to install equipment to measure temperature and moisture in the till layer on the rock pile. This information will show whether or not the cover is staying frozen to prevent possible contaminated runoff or seepage. Diavik installed four of the equipment clusters in 2019. They are required to install a minimum of five.

Three of the instrumentation locations were approved by the WLWB in 2018. Diavik proposed the fourth location in September 2019. EMAB reviewed the proposal and made nine recommendations. GNWT-ENR also made comments. DFO, ECCC and WRRB did not provide comments.

EMAB raised the same concerns about the proposed instrument location as for the three locations approved by the WLWB last year (see EMAB Annual Report for 2018-19).

WLWB DECISION

The WLWB approved the Instrumentation Location for Area 4 of the NWRSA as proposed by Diavik. They noted that Diavik will have to demonstrate that the instrument locations are able to show how well the cover is performing.

3. REQUEST TO MODIFY NWRSA COVER THICKNESS

On January 9, 2020 Diavik submitted a request to the WLWB to allow a thinner cover than approved over parts of the NWRSA.

EMAB had Randy Knapp do a technical review of the request and submitted six recommendations to the WLWB. ECCC and GNWT-ENR also submitted comments. DFO and WRRB stated they had no comments on the report.

The key issues EMAB identified were:

- i) The current modelling doesn't look at situations where the till moisture levels are lower than 10%, but in many places the actual levels are less, as low as 5.8%.

RECOMMENDATION: Diavik should undertake additional modelling to demonstrate the cover will perform at the measured lower moisture contents.

- ii) The model shows that at the reduced thickness the entire cover would thaw, leaving no buffer for uncertainty.

RECOMMENDATION: Diavik should consider increasing the minimum moisture content in areas it is proposing for reduced cover thickness

- iii) How is Diavik ensuring that the minimum till depth is being achieved?

RECOMMENDATION: Can Diavik explain the control procedure proposed to assure a minimum till cover depth is achieved?

WLWB DECISION

The WLWB did not approve Diavik's proposal to reduce cover thickness on the NWRSA. They also required Diavik to submit confirmation that the lakebed sediments being used for the till layer are similar to those used in Diavik's modelling. They further advised Diavik that the company must ensure that the till layer is placed so that it will remain at a minimum 1.5-metres thickness post-closure, and that it must provide evidence of this.

Note: Diavik provided confirmation from their consultants that the lakebed sediments are similar to those used in the model.

WILDLIFE MONITORING PROGRAM

Fast facts about Diavik's Wildlife Monitoring Program (WMP):

- The WMP began in 2002.
- The WMP is required by the Environmental Agreement.
- The WMP is not required by the water licence or reviewed/approved by the WLWB.
- Diavik submits annual Wildlife Monitoring Reports (WMR's) to EMAB.
- The WMP studies the mine's effects on wildlife and vegetation in the study area.
- The study area is a 1,200-sq.-km L-shaped block of land taking in the south-east area of Lac de Gras and the adjacent mainland. It includes the East and part of the West Island.
- The three main species that Diavik studies are barren-ground caribou, grizzly bear and wolverine.

1. WILDLIFE MONITORING PROGRAM DESCRIPTION

Diavik has had a Wildlife Monitoring Program Description since 2002. Over time it has occasionally been reviewed and revised in consultation with EMAB, GNWT, communities and other mines. In 2017 EMAB noted that Diavik was making changes to some parts of its WMP methodology and describing these changes in its annual WMP reports. EMAB did not agree with this approach, noting that it led to inconsistency and became difficult to track how the program was changing over the years.

EMAB recommended Diavik prepare a program description for the WMP in April 2018. Diavik agreed to develop a program description in 2020. It will be drafted by June. EMAB further recommended that Diavik should collaborate with other groups when developing it.

EMAB RECOMMENDATION: Develop a WMP program description in line with the EA requirement that Diavik revise its environmental monitoring programs on an ongoing basis in response to changing circumstances and additional information.

Diavik response (summarized): Diavik agreed to develop a WMP description that will align with GNWT WMMP requirements.

EMAB RECOMMENDATION (DDMI-WMP-4): Diavik should hold a workshop with the TK Panel, EMAB and GNWT-ENR to collaborate on the development of the Wildlife Monitoring Program Description.

Diavik Response (summarized): Diavik responded they will not hold a workshop as they feel a broader workshop run by the GNWT, including the Parties and other Mines would be more suitable.

2. 2019 WMR

The goal of the Wildlife Monitoring Report (WMR) is to compare annual results of the program to predictions made at the beginning of the project, and to any revised objectives. Diavik submitted their 2019 WMR to EMAB on April 8, 2020. EMAB had MSEs (Management and Solutions in Environmental Science Inc.) help with the review.

Highlights from the 2019 WMR and EMAB's review of the WMR are below:



2.1 BARREN GROUND CARIBOU

Diavik's caribou studies have focused on the Bathurst herd. The Bathurst herd travels through the Lac de Gras area during their annual migration. Recently, caribou from the Beverly/Ahiak herd are also seen near Diavik in the winter and early spring. This herd may now also be affected by the mines.

Diavik's Caribou Monitoring Includes:

- Monitoring the Caribou zone of influence (ZOI)
- Behaviour data collection and analysis
- Analysis of migration and deflections around the mine
- Recording caribou incidents and fatalities that are a result of the mine

2.1.1 EFFECT OF POPULATION DECLINE ON MONITORING

EMAB's priority concerns about the effect of population decline on monitoring:

- The Bathurst Caribou population has declined by about 20 times since Diavik opened to about 8,200 animals. In addition, Bathurst caribou are staying further north for a longer period of time than in the past, so are not in the Diavik area in the summer anymore.
- Lower numbers of caribou affect how they can be monitored.
 - › It's harder for Diavik to complete monitoring objectives when there aren't many caribou around to monitor, or if they arrive in the Diavik area when it's too cold to monitor.

2.1.2 ZONE OF INFLUENCE

What is a Zone of Influence?

- Area where the mine affects wildlife.
- Wildlife may be sensitive to human made sounds, smells, dust, and infrastructure within ZOI.
- Wildlife tend to avoid the ZOI.
- Behaviour of wildlife may differ inside the ZOI versus outside of the ZOI.
- Previous studies show that there is a 14-kilometre ZOI around Diavik and Ekati. This is larger than what was predicted at the start of the Diavik Project.

How is the ZOI monitored?

- In the past, Diavik has done aerial surveys to assess the ZOI.
- The ZOI monitoring guidelines say that the ZOI should be re-evaluated when there is a significant shift in activities at the mine (e.g. building a new mine pit, like A21 at Diavik).

Why monitor the Zone of Influence?

- We want to know how proximity to the mine affects caribou.
- The more we know about the ZOI, and what might cause it, the more we can attempt to mitigate potential causes and reduce the size.

EMAB's priority concerns about the ZOI:

- The ZOI has not been assessed since 2012.
 - › EMAB's view is that a re-assessment of the ZOI is overdue.
 - › EMAB recommended that the GNWT provide direction for Diavik to resume the monitoring.
 - » Note: EMAB's recommendation to GNWT went unanswered for nearly one year.

- Diavik did a new analysis of available ZOI data. The analysis suggests that there is no ZOI around the Diavik mine.
 - › EMAB is not confident in Diavik's ZOI re-analysis. EMAB sent Diavik many questions and recommendations about the re-analysis.
 - › Diavik says that Caribou avoid areas of less suitable habitat and the mine doesn't contribute to a ZOI.
 - » For example, the mine is surrounded by LdG, Diavik says Caribou are avoiding the water, not the mine.

EMAB RECOMMENDATION TO GNWT: GNWT-ENR should follow through on its commitment to recommend that Diavik resume ZOI monitoring in accordance with the ZOI Guidance Document, in 2019.

GNWT Response (summarized): GNWT ENR recommends the ZOI draft guidance document be used by mine operators to guide their decisions related to meeting the intent of their WMP and reinstating ZOI monitoring.

EMAB notes on this response:

- GNWT's response to this recommendation was 295 days late.
 - › The response places the decision to resume ZOI monitoring with mine operators.
 - › EMAB's view is that GNWT should provide this direction to the mines.
- During a call with the GNWT in April 2020, GNWT agreed that it would be beneficial to get all the mines together to discuss TTG guidance document recommendations, and how to resume ZOI monitoring.

EMAB RECOMMENDATION TO DIAVIK: We recommend DDMI provide additional information on their intentions for reinstating ZOI monitoring and potential methods.

Diavik Response: At the time of writing this report, we have not received Diavik's response. Their response is due on August 25, 2020.

2.1.3 BEHAVIOUR

How does Diavik monitor caribou behaviour?

Diavik observes groups of caribou and records the type of activity (for example, running, trotting, eating, bedded).

- The goal is to collect behaviour data on caribou groups both inside and outside of the ZOI to see the difference in their behaviour.
 - › Diavik has had trouble collecting enough data on caribou groups outside the ZOI in the last few years. This is because caribou are in this area in the winter now. Diavik policy restricts staff from such activities far from the mine when the temperature is below -30°C.

Why monitor caribou behaviour?

- To see how caribou behave inside the ZOI versus outside
- Caribou movement/migration routes around the mine have changed. Analyzing their behaviour might help tell us why.
- Behaviour analyses could help us understand what specific mine stressors (e.g. blasting, human presence, dust) are causing caribou to avoid the ZOI.
 - › Identifying stressors is the first step to mitigating them.



EMAB's priority concerns about behaviour monitoring:

- Behaviour analysis has become difficult due to reduction in caribou around the mine. There are not enough caribou to collect sufficient data when the weather is warm enough.
- There is a lot of old behaviour data but not very much new data. We need new data for new analyses that reflect the current situation at the mine.

EMAB RECOMMENDATION TO DIAVIK (DDMI-WMP-11): We recommend that DDMI continue their efforts to collect caribou behaviour data annually.

Diavik Response: At the time of writing this report, we have not received Diavik's response. Their response is due on August 25, 2020.

2.1.4 DISTRIBUTION AND MIGRATION

What is deflection monitoring at Diavik?

- Watching caribou to see which way they move around the mine during their migrations.
- Initial predictions said that caribou would:
 - › Travel west of East Island during spring migration (northern migration)
 - › Travel east of LdG during fall migration (southern migration)
- Monitoring over the years has shown that caribou do not always follow the predictions, especially in more recent years.

EMAB's concerns about Diavik's deflection monitoring:

- In the 2018 WMR, Diavik said they were going to stop deflection monitoring.
- In response, **EMAB recommended that if Diavik is proposing to remove deflection monitoring, they should propose ideas to continue to monitor the predictions about herd distribution, specifically in relation to the Diavik Mine, using collar data.**
- The original predictions that led to deflection monitoring are hard to verify.
 - › Original predictions were about caribou energetics (meaning, how much energy a caribou would use to go around the mine one way versus another way).
 - » Diavik's deflection monitoring has not been verifying original predictions related to energetics. They have only been reporting which way the caribou are travelling around the mine.

- Diavik discontinued deflection monitoring in 2019. The reasons they gave were:
 - › data show that caribou have not followed the predicted path for southern migration for a long time, so the prediction was wrong.
 - › it doesn't matter which way caribou deflect around the mine during their migrations because it doesn't result in the herd getting separated from each other.
- Diavik says they will continue to monitor the range of the herd using collar data, but this won't tell us about energetics or east/west deflections.

EMAB has stressed the need for ongoing migration monitoring because caribou movement around the East Island has changed over time and the only way to know if it stays the same, or changes, is to continue monitoring.

EMAB RECOMMENDATION (DDMI-WMP-17): **Answer the following questions regarding potential influence of the mine:**

- **Did the southern migration change at a time of new infrastructure (e.g. new pit)?**
- **Did important corridors become dysfunctional?**
- **Does dust deposition increase the energetic cost of migration?**
- **Is dust higher on one side of the mine? What is the prevalent wind direction?**
- **Is foraging better going west for fall migration?**

Diavik Response: At the time of writing this report, we have not received Diavik's responses. Their responses are due on August 25, 2020.



2.2 GRIZZLY BEAR

Diavik monitors grizzly bear abundance and distribution over time. Diavik's impact on grizzly bear is likely minimal because:

- Hair snagging results from 2012, 2013, and 2017 show that grizzly populations are stable
- Mortality rates do not exceed predictions made in the EA. The predicted rate is 0.12 to 0.24 bear per year

Diavik, Ekati, Snap Lake, and Gahcho Kué mines combine efforts under the GNWT's direction to conduct a regional hair snagging program to gather DNA data on grizzly bear. EMAB supports Diavik's continued involvement in the grizzly bear hair snagging program. EMAB and Diavik are waiting for GNWT to provide direction on when to resume monitoring.

EMAB RECOMMENDATION:
GNWT-ENR should continue to provide direction on hair snagging surveys to ensure objectives and predictions are being tested. ENR should confirm the schedule for future hair snagging surveys.

GNWT Response (summarized):

- GNWT said they will organize a workshop in fall 2020.
- EMAB notes that this response was 295 days late.

2.3 WOLVERINE

Diavik monitors wolverine to estimate their abundance and distribution over time. Wolverine presence around Diavik is monitored using snow track surveys, hair-snagging surveys, and incidental observations.



2.3.1 SNOW TRACK SURVEYS

Snow track surveys give an idea of wolverine occupancy in an area. Snow track surveys cannot tell how many wolverine there are, or if the wolverine is still around. In addition, tracks can easily become covered by new snow, or blown away in the wind.

Diavik completed two rounds of snow track surveys in 2019. The survey was completed with the help of community members from Lutselk'e and Whati.

Wolverine track surveys take place twice each year. In 2019, wolverine tracks were found at 7 out of 40 areas studied during the first survey, and 15 out of 40 areas in the second survey. The same areas were sampled both times. More tracks were observed in 2019 than in 2018.

RECOMMENDATION (DDMI-WMP-12): EMAB recommends the continuation of the snow tracking program to monitor impacts of the mine on wolverine detectability, occupancy, colonization and extinction.

Diavik Response: at the time of writing we have not received Diavik's response. Their response is due August 25, 2020.

2.3.2 COMPREHENSIVE ANALYSIS

The 2019 WMP included a comprehensive analysis on wolverine. Diavik completes these analyses every 3 years. They help track changes to wolverine over time.

Main findings from the 2019 comprehensive analysis:

1. Wind had a big affect on track detectability. This affects estimates on wolverine occupancy.
2. Wolverine occupancy in the area has stayed consistent and relatively high.
3. Increased mine activity seems to decrease wolverine occupancy.

Diavik also tried to find out how habitat quality and distance from mine affected wolverine occupancy, and found:

- Slight increase in wolverine occupancy further from mine.
- Small increase in number of wolverine tracks where habitat was better.

However, there were problems with sample sizes and the results produced were weak, and different from previous comprehensive studies. It would be better to have more data to get stronger results.

2.3.3 HAIR SNAGGING SURVEYS

Wolverine hair snagging surveys did not occur in 2019. ENR organizes wolverine hair snagging surveys with the mines. The surveys determine wolverine abundance and distribution near Diavik and Ekati. The last hair-snagging survey was completed in 2014. The results showed that wolverine density at Diavik, Ekati and Daring Lake declined between 2005-2014. The smallest decline occurred at Diavik. The long-term schedule for wolverine hair snagging surveys has not been determined. Diavik and Ekati are waiting on direction from ENR.

RECOMMENDATION: GNWT-ENR should continue to provide direction on hair snagging surveys to ensure objectives and predictions are being tested. ENR should confirm the schedule for future hair snagging surveys.

GNWT Response (summarized):

- GNWT said they will organize a workshop in fall 2020.
- This response was 295 days late.

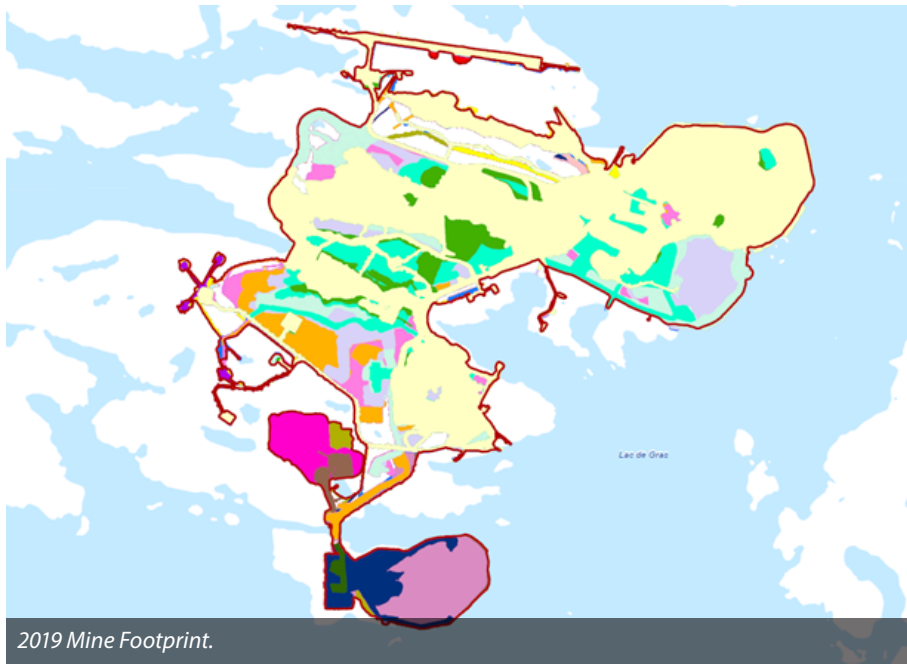
2.3.4 DETERRENT ACTIONS

In 2019 there were zero wolverine mortalities. There were two wolverine relocations and seven instances where deterrent actions were used on wolverine. There were 19 days in 2019 where wolverine were seen on the mine site. Wolverine observations on site have been decreasing since 2015.

2.4 RAPTORS

Diavik monitors pit walls and mine infrastructure for nesting raptors. This year they found:

- Two peregrine falcon nests were observed. One was located at the Site Services building and the other was at the processing plant.



- A rough legged hawk nest was found at pit A418. Another rough legged hawk nest was suspected, but unconfirmed, at pit A154.
- A raven's nest was found at the south tank farm. Two young fledged the nest.

2.5 WASTE MANAGEMENT

Food waste at Diavik must be properly disposed in order to minimize food attractants to wildlife. There were a lower number of misdirected food items in 2019 than in 2018 in the waste transfer area (WTA). However, there were higher numbers of misdirected waste in the landfill, A21 area, and underground

in 2019 compared to 2018. The most misdirected waste items are found at the landfill and the WTA.

The number of wildlife observed at the WTA and landfill were fewer in 2019 than in 2018. Red fox were the most commonly seen species.

2.6 VEGETATION SURVEYS

As of 2019 the Diavik project footprint is 11.19 km². Last year, Diavik reported that the footprint was 11.62 km². The footprint has gotten smaller because Diavik changed how they classify habitat. In 2019 Diavik determined that some small undisturbed areas within the mine footprint were still usable

habitat, so they removed these areas from the footprint. The amount of vegetation loss remains below the original prediction of 12.67 km².

The South waste rock storage area (SWRSA) was the only area of the mine to increase in size in 2019. It is also the only area expected to increase in size for the rest of Diavik's operations.

WILDLIFE ACT: NEW GNWT REQUIREMENTS — WMMP'S

In July 2019, the GNWT released requirements for wildlife monitoring programs as regulations under the *Wildlife Act*. They now require proponents to have Wildlife Monitoring and Management Plans (WMMP's) if a development is likely to result in significant disturbance or pose a threat of harm to wildlife or wildlife habitat. This includes contributions to cumulative wildlife effects. WMMP's need to be approved by the ENR Minister. They are legally enforceable.

EMAB is pleased to see these regulations put into place by the GNWT. Previously, there were no legal requirements for wildlife monitoring.



Dustfall gauge.

Photo courtesy of Diavik Diamond Mine



TSP monitoring station.

EMAB Photo

ENVIRONMENTAL AIR QUALITY MONITORING PROGRAM

Diavik's Environmental Air Quality Monitoring Program (EAQMP) started in 2012. The program is required by the EA, but is not required by the water licence, or reviewed/approved by the WLWB. Diavik submits annual EAQMP reports. Diavik submitted an EAQMP re-assessment in January 2019.

EMAB was planning to hold an EAQMP workshop in 2020. Organizing the workshop was

pushed back due to COVID-19, but the workshop is now indefinitely on hold as EMAB has decided to request that the Minister review the EAQMP.

1. EAQMP RE-ASSESSMENT (ENVIRONMENTAL AIR QUALITY MONITORING AND MANAGEMENT PLAN VER. 2)

EMAB hired Arcadis Canada to do a technical review of Diavik's Air Quality Monitoring and Management Plan. The goal of this review was to identify parts of the program that can be improved. EMAB's overall view is that Diavik's EAQMMP is inadequate. Because of the inadequacies, EMAB has requested Ministerial review of the Program.

Highlights of EMAB's concerns with EAQMMP Version 2 include:

CONTINUOUS AIR MONITORING (CAM)/TSP MONITORING:

TSP Monitoring was removed from EAQMMP Version 2. EMAB believes TSP monitoring is a vital component of air quality monitoring. See section 2.1. (Continuous Total Suspended Particulate Monitoring Program). Up until 2018 Diavik had two TSP monitors on-site.

In addition to concerns about stopping TSP monitoring, EMAB also has concerns about how TSP monitoring has been carried out since the program started in 2012. Concerns with Diavik's TSP monitoring program are:

- Improper monitor placement. Monitors should be placed down wind of dust sources. TSP monitors at the mine appear to have been placed upwind of the biggest sources of dust at the mine (e.g. A21 open pit).
- The model that determines where monitors should be placed used outdated weather data.
- Poor maintenance and calibration of TSP monitors. Diavik does not have enough sufficiently trained staff dedicated to maintaining TSP monitors.
- Data completeness. GNWT recommends that data should be 85% complete to be useful. Diavik's data capture rate tends to be much lower than that.
 - › In the two years where only one monitor was operating, Diavik managed to collect above 85% of the data on a single monitor.
 - › Data capture should be at least 85% on BOTH monitors. There has not been a year where both monitors have captured above 85% of the data. Data capture has been as low as 44%.
 - › Diavik claims they have shown TSP is not a problem. EMAB's view is that accurate assessment of the results is not possible without complete data.
- TSP monitoring for the lifetime of the mine is an EA requirement. It is important to track where TSP levels are now and how they change over time.

EMAB RECOMMENDATION: EMAB recommends that Diavik continue to collect TSP data as set out in the currently approved EAQMP until a revised EAQMP has been finalized, reviewed and agreed to by EMAB, GNWT and other Parties to the Environmental Agreement.

Diavik Response: An update to DDMI's Environmental Air Quality Monitoring and Management Plan (EAQMMP), Version 2 was submitted in January of 2019. The purpose of the EAQMMP V2 was to remove continuous

total suspended particulate (TSP) monitoring while maintaining the other elements of DDMI's air quality monitoring and management programs. That submission provided the rationale for the change. DDMI considers the EAQMMP Version 2 to be finalized.

EMAB notes that our recommendation was originally sent on July 3 2018. Diavik did not respond to the recommendation and EMAB re-sent it to Diavik in January 2020. Diavik responded 13 days late to the resubmitted recommendation.

2. 2018 EAQMP ANNUAL REPORT

Diavik submitted the 2018 EAQMP Annual Report to EMAB in July 2019. EMAB had Arcadis help with the technical review of the annual report and submitted 10 recommendations to Diavik on October 30, 2019. Diavik sent EMAB their responses 19 days late, on January 12, 2020.

Below are some highlights from our review. Go to EMAB's website: emab.ca to see the technical report and full list of recommendations on Diavik's 2018 EAQMP.

2.1. CONTINUOUS TOTAL SUSPENDED PARTICULATE MONITORING PROGRAM

Diavik used to monitor the amount of suspended airborne particles using two Total Suspended Particulate (TSP) monitoring stations. The TSP collected is made up of dust and air emissions. TSP comes from sources such as exhaust from haul trucks and the processing plant, and dust particles that come from blasting rocks.

EMAB considers TSP monitoring to be very important. There are a number of concerns about TSP monitoring at Diavik. EMAB's main concern of is the lack of reliable data. Another issue is that the TSP monitors have a lot of downtime due to technical difficulties. Only one of two TSP monitors worked in 2018. The monitor located at

the A154 dike was not operational all year. The monitor located at the Communications Building was operational for 86% of the days in 2018.

There were no recorded exceedances of the GNWT air quality guidelines for TSP in 2018. However, there could be unrecorded periods of TSP exceedances at times when the monitors were not working. EMAB has raised this concern every year, but it is extra concerning for 2018 since only one monitor was working. With this in mind, EMAB does not feel the information provided by the TSP program is reliable.

EMAB RECOMMENDATION: A detailed comparison of monitored and modelled TSP/dustfall be included in the EAQMP.

Diavik responded that they will present a comparison of monitored versus modelled TSP/dustfall at the upcoming air quality monitoring workshop. As noted above, this workshop is now indefinitely postponed.

2.2. DUSTFALL MONITORING

Diavik also monitors dustfall at the mine. Dustfall is the amount of TSP that falls out of the air and settles on the ground. The larger particles settle quickly near the mine. The smaller ones can travel long distances in the wind and settle to the ground far from the mine site. Diavik measures the amount of dustfall at different distances from the mine. They also test what chemicals are in the dust. Diavik monitors dustfall at the mine using dust gauges and snow cores:

- Dustfall Gauges:
 - › Collect dust on land that Diavik can analyze
 - › 2018 analysis suggests dustfall rates increased in 2018
 - › This is likely due to development of the A21 pit



- Snow Core Samples
 - › Dust gets trapped in the snow. By analyzing 'cores' of snow, Diavik can see what chemicals are in the dust both on land and on LdG.
 - › In 2018, none of the snow cores analyzed had chemicals that exceeded baseline.
 - › There were higher levels of chemicals in the snow cores near the mine than in snow cores further away.

Diavik's dustfall sampling frequency does not follow air quality monitoring methodology guidelines. GNWT does not have guidelines for dustfall, so BC guidelines are used. Diavik's dustfall monitoring also does not provide enough information to analyze air quality.

EMAB RECOMMENDATION: Dustfall monitoring results should be used to evaluate the effectiveness of dust suppression efforts.

Diavik responded that they intend to present a special dust study about the effectiveness of dust suppression activity.

3. YELLOW HAZE

People from communities have told EMAB about yellow haze seen over the Diavik Mine from time to time. It can be especially visible on cold winter days. This is not discussed in the EAQMP, so this year EMAB decided to make a recommendation.

EMAB RECOMMENDATION (DDMI-EAQ-15):
Sample the yellow haze and report on its chemical make-up and concentration, or develop a program to sample it.

Diavik Response: DDMI noted that it is unaware of a “yellow haze” at the Diavik Mine and is uncertain about EMAB’s source of this information. DDMI has not observed a “yellow haze” above the Diavik Mine nor provided a record of such an event in any monitoring report. For these reasons, DDMI is not able to develop a program to sample it and report on the chemical make-up.

EMAB followed up by providing Diavik with a photo of the haze taken by EMAB’s Chair.

ENVIRONMENTAL AGREEMENT ANNUAL REPORT

As part of the EA, Diavik must submit an Annual Report to the Parties, the Government of Nunavut and EMAB every year. The Environmental Agreement Annual Report (EAAR) must be approved by the Minister. The purpose of the EAAR is to summarize the mine’s activities and results of the environmental monitoring programs from the past year.

Diavik submitted their draft 2018 EAAR to EMAB and the GNWT on June 11, 2019. EMAB reviewed the report. EMAB submitted 8 recommendations on the Draft 2018 EAAR (these can be found at www.emab.ca). The GNWT also submitted recommendations.

Key EMAB recommendations were:

EMAB RECOMMENDATION: The TK section of the Report and Appendix III lists the TK panel recommendations, but it does not include Diavik’s responses to the recommendations. Diavik should include their responses.

EMAB RECOMMENDATION: In accordance with the EA section 12.1 (c) (x), Diavik should include comments of public concerns and Diavik’s responses, in addition to listing community engagement events.

Diavik sent back a revised EAAR on July 25, 2019. At that time, it was also submitted to the Minister and circulated for public review. Diavik addressed most of the recommendations made by EMAB. EMAB had no further recommendations on the final version of the EAAR.

MINISTERS DECISION:

On October 18, 2019 the Minister released their decision. The Minister determined that the 2018 EAAR was satisfactory.



Photo courtesy of Diavik Diamond Mine

REPORT CARD ON DIAVIK AND THE REGULATORS

EMAB's mandate includes oversight of the regulatory process. This section summarizes how Diavik and other Parties have responded to EMAB recommendations. It also summarizes the level of engagement of the various regulators responsible for the Diavik file.

WATER LICENCE

Diavik's responsiveness to EMAB recommendations last year has been good with respect to issues related to its water licence, including closure planning. Diavik has responded promptly and thoroughly to EMAB's recommendations as made through the WLWB review process.

Regulator responses to Diavik's requests and reports has been variable (see Table of Reviewer Responses below).

Since 2015 EMAB has been expressing concern about the involvement of two key federal government departments in the review of monitoring reports and management plans related to Diavik's Water Licence. EMAB's view is that both the Department of Fisheries and Oceans, and Environment and Climate Change Canada have an important role to play in providing oversight on Diavik's impact on the air and water in the Diavik mine area. EMAB has recommended ECCC, and DFO in particular, be more active in making comments and recommendations. EMAB continues to be disappointed by DFO's lack of substantive comment on reports that bear on the health of fish and fish habitat.

DFO did not comment on any of the reports listed in the Table of Reviewer Responses except for the MVEIRB PK to Pits hearing intervention and the A21 Underground Water Licence Amendment Application.

EMAB notes that DFO amended the *Fisheries Act* in 2019 and it is our hope that this renewed interest will also result in greater DFO engagement in reviewing reports from Diavik under their Water Licence.

This year ECCC commented on two of the reports listed as well as intervening in the MVEIRB PK to Pits project hearings.

In 2019 the Inspector visited the Diavik mine site six times and made four presentations to EMAB throughout the year on the results of the inspections. The Inspector did not comment on any reports listed during the last year.



Table of Reviewer Responses

Reviewer	ECCC	DFO	GNWT - ENR	EMAB
2018 AEMP Report	No comment	No comment	Commented	Commented
Environmental Assessment – PK to Pits Project	Intervened	Intervened	Intervened	Intervened
Water Licence Amendment / A21 Underground	Commented	Commented	Intervened	Commented
WRSA Instrumentation Location	No comment	No comment	Commented	Commented
AEMP Design Version 5.1	No comment	No comment	Commented	Commented
WRSA Cover Modification Request	Commented	No comment	Commented	Commented
Engagement Plan Ver. 3.0	No comment	No comment	No comment	Commented

ENR-Waters commented on all the reports we looked at except Diavik’s Engagement Plan and we commend their continued thorough and substantive reviews of the Diavik Water Licence plans and reports. EMAB notes that ENR did not comment on Engagement Plan Version 3.0 or the PK to Pits Review Panel TOR, out of concern that the proper procedural process for the PK to Pits hearings was not being followed (Engagement Plan 3.0 was released for review before the Minister had made a decision on the PK to Pits Proposal). ENR-Waters also intervened in the MVEIRB PK to Pits project hearings.

Similarly, the WLWB consistently provides detailed reviews of all documents submitted by Diavik for review.

We note that the WRRB has made submissions on a number of water licence report reviews stating that they had no comments.

WILDLIFE MONITORING

Diavik’s responses to EMAB’s recommendations on wildlife monitoring have been variable.

- On the 2017 WMP Report Diavik did not respond to EMAB’s recommendations related to the WMP within the 60-day period required by the Environmental Agreement on four recommendations: they were 37 days overdue for three, and five days late for the fourth.
- On the 2018 WMP Report, 21 of Diavik’s 24 responses were 7 days overdue, the other three were 8 days late.

EMAB has developed a new tracking system for recommendations, with Diavik’s input, that we hope will ensure all responses are received within 60 days.



Photo courtesy of Diavik Diamond Mine

accommodate wildlife in the area, and monitoring effects to wildlife, post-closure.

AIR QUALITY MONITORING

Diavik submitted the 2018 EAQMP report and EMAB's review is discussed earlier in this report. EMAB made 10 recommendations and Diavik's response was 19 days overdue.

EMAB made 10 recommendations on the 2017 EAQMP report that Diavik did not respond satisfactorily to. These were re-sent and Diavik's responses were 13 days overdue.

Diavik submitted an assessment of the EAQMP, as recommended by EMAB; EMAB comments on the EAQMP are also presented earlier in this report. Diavik did not respond to two sets of recommendations from EMAB on the EAQMP. EMAB is disappointed in Diavik's proposal to discontinue TSP monitoring; our reviews indicate that the program could work if it were re-designed and provided with better resources.

ENR - Air Quality did not make comments on the 2018 EAQMP report. EMAB looks forward to ENR - Air Quality's comments and recommendations on Diavik's future air quality monitoring reports.

INSPECTOR'S AUTHORITY TO GIVE DIRECTION

The delay in ENR's legislative updates means that any change to section 67(1) of the *Waters Act* will also be delayed. We believe the changes previously proposed by ENR would resolve our concern about possible limitations on the Inspector's authority to give direction to Diavik in the current wording of the Act. We trust that ENR will advance this change as soon as reasonably possible (see 2016-17 Annual Report for details on this issue).

In March of 2020 ENR-Wildlife responded to EMAB's recommendations on the WMP, which were sent on March 20, 2019. While EMAB is pleased to have received a response, it should not require 355 days and two reminder letters; the Environmental Agreement requires all Parties to provide a response within 60 days.

- To EMAB's knowledge ENR-Wildlife did not make comments on Diavik's 2018 WMP report. They have committed to reviewing the 2019 WMP report.
- ENR-Wildlife has not given follow-up direction to Diavik on re-starting ZOI monitoring but has indicated it plans to reconvene the ZOI Technical Task Group to move this forward.
- ENR-Wildlife have committed to holding a workshop on DNA hair snagging for Grizzly bear and wolverine sometime during or after fall 2020.
- ENR-Wildlife have not taken action on issues regarding the collection of caribou behaviour data near and far from the Diavik-Ekati caribou zone of influence.
- EMAB continues to look forward to ENR-Wildlife's input on closure criteria for wildlife in Diavik's ICRP as they relate to how the post-closure landscape will

COMMUNICATIONS



ANNUAL GENERAL MEETING (AGM)

Each September, we hold our AGM in our Yellowknife office boardroom. Parties to the Environmental Agreement are invited to attend and provide input on EMAB's activities and direction. In September 2019 Charlie Catholique was elected as Chair, Jack Kaniak was elected Vice Chair and Machel Thomas was elected as Secretary-Treasurer.

EMAB DIRECTORS

EMAB Directors are one of the main ways EMAB communicates with Affected Communities. Our Directors are responsible for updating communities on what is going on at Diavik and bringing any concerns and questions about the environment at Diavik back to EMAB. Due to funding reductions from Diavik, and lack of uptake, EMAB has cut back the budget that covers Director consultation in communities.

COMMUNITY MEETINGS

As discussed in the section on Involving and Supporting Communities, EMAB holds public updates in the communities of the Aboriginal Parties. The goal is to keep people informed and allow them to ask questions and voice opinions and concerns.

PUBLIC LIBRARY

EMAB is responsible for making sure that people have access to materials that relate to the Environmental Agreement. Anyone interested can visit our office and access plans and reports, expert reviews, correspondence, Board meeting minutes, maps and images. Our office hours are 8:30 a.m. – 4:30 p.m. Monday to Friday. EMAB's library has been closed to the public during the COVID-19 pandemic.

Much of this information is also available on our website.

WEBSITE

EMAB's website is another way for EMAB to reach out to the people. We use our website to post our comments and recommendations on Diavik's WMP and EAQMP reports. We also post EMAB Annual Reports, Diavik's EAARs, meeting minutes and correspondence. ICRP and AEMP comments can be found on the WLWB public registry. You can visit us at our website, **emab.ca** and our Facebook page, **facebook.com/EMAB2015**.

ANNUAL REPORT

EMAB circulates its annual report to all Parties to the Environmental Agreement, as well as key leaders in the Affected Communities and throughout the NWT.

BROCHURE AND POSTER

EMAB has a brochure and poster summarizing our work. These are available on request.

EMAB GOVERNANCE AND OPERATIONS

EMAB Photo



The Board met nine times in 2019-20; five face-to-face meetings and four conference calls. The Annual General Meeting took place on September 10. The Board passed 25 email motions over the year.

Some Parties appointed new Board members in 2019-20: Tłıchǫ Government replaced Sean Richardson with Violet Camsell-Blondin, Yellowknives Dene First Nation replaced Napoleon Mackenzie with Machel Thomas, who was later replaced by Sarah Gillis, and Canada appointed Dinah Elliott.

Charlie Catholique took over as Interim Chair of the Board following the passing of Napoleon Mackenzie in May, and was elected Chair at the Annual General Meeting (AGM) with Jack Kaniak elected as Vice-Chair. Julian Kanigan was Secretary-Treasurer and was replaced by Machel Thomas at the AGM. Machel left the Board in November 2019 and Violet Camsell-Blondin took over as Secretary-Treasurer in February 2020.

BUDGET AND FINANCE

EMAB's budget for 2019-20 was \$553,395; this included requesting agreement from Diavik to roll over \$39,575 from 2018-19 coupled with Diavik's payment of \$506,820. EMAB spent \$443,263 during the year. With Diavik's agreement we will roll over \$5,259 for activities in 2020-21 and will return \$878 to Diavik.

EMAB negotiates its budget with Diavik every two years, for the following two years. At the end of the two-year period any surplus must be returned to Diavik, except as agreed between Diavik and EMAB. The Environmental Agreement says that EMAB will try to keep any increases to the rate of inflation. EMAB recommends a budget to Diavik that we both have to agree on. If there is no agreement Diavik submits its own proposed budget to the Minister and he can choose EMAB's or Diavik's. EMAB and Diavik agreed on the last two 2-year budgets, but for the previous three budget periods EMAB and Diavik



did not agree, and each time the Minister chose Diavik's budget. This has resulted in EMAB's budget being cut back from \$726,000 in 2011 to \$506,820 in 2019. To conduct any activities above and beyond those budgeted EMAB must submit a separate funding request to Diavik for approval.

DIAVIK SITE VISIT

Board members and staff took a site tour of Diavik on June 17, as part of the June 2019 Board meeting. The tour covered the above-ground portion of the site including: north and south WRSA, PKC Facility, A154, A418 and A21 pits, landfill area and NI, as well as the WTA and Water Treatment Plant.

Board members and staff found the tour quite useful and noted a number of changes since the previous visit, including additional re-sloping work on the north WRSA, dam raise work on the PKC, start of mining in the A21 pit and expansion of the south WRSA near A21. The group also noted bags of hydrocarbon contaminated soil kept in a lined facility at the Waste Transfer Area.

While at site the Board met with Diavik staff to discuss plans for post-closure monitoring, and strategies to involve Aboriginal people.

ACTION PLAN

EMAB finalized and adopted an Action Plan for 2019-24. The plan was finalized and adopted on June 19, 2019. Much of the plan aims at continuing EMAB's ongoing approach of focusing on technical reviews of key Diavik plans and reports, and keeping Affected Communities and others informed about activities at Diavik, and any issues or concerns. Some key changes to the plan include:

- Providing 1-page meeting summaries to Parties;
- Continuing assessment of Diavik response to TK Panel recommendations;
- Developing a 1-page summary of the role of EMAB Board members; and
- Addressing potential for conflict of interest at Board meetings through a broader COI policy.

ENVIRONMENTAL AGREEMENT

GNWT proposed amendments to the Environmental Agreement in 2013 to reflect the transfer of certain powers under devolution. The draft Environmental Agreement amendments are being reviewed by lawyers from GNWT and Canada. Once this task is complete GNWT expects to circulate the draft amendments to the Parties to the Environmental Agreement for review and comment.

OPERATIONS

EMAB's Environmental Specialist, Allison Rodvang, left EMAB in April 2019. Janyne Matthiessen replaced her in May 2019. The Executive Director position has remained consistent.

EMAB's Operations Manual was reviewed and updated.



WHAT ARE EMAB'S PLANS?

As noted above, EMAB will continue to address the challenge of the COVID-19 pandemic next year. In particular we will be working to meet the needs of Board members and communities to be informed about Diavik's environmental activities, plans and monitoring program while minimizing potential for exposure, and meeting directives from the Chief Public Health Officer.

Our priorities for 2020-21 will have a focus on closure plan revisions along with the environmental assessment of the PKMW project and subsequent water licence proceeding, and the A21 underground water licence amendment process. EMAB will also inform the Minister that we feel the current Environmental Air Quality Monitoring Program is inadequate, and will review the new Wildlife Monitoring Program description. Other planned activities include:

OVERSIGHT AND MONITORING

Continue monitoring development of the A21 pit as mining proceeds.

Continue participation in ENR initiative to revise environmental legislation including the *Waters Act* and *Environmental Protection Act*.

Continue to monitor and participate in development of GNWT policy on security and long-term liability and monitoring for closed minesites.

REVIEW REPORTS:

- 2019 AEMP Annual Report
- 2020 AEMP Annual Report
- 2017-2019 AEMP Re-Evaluation Report
- 2020 Annual WMP Report
- 2019 EAQMP Report
- ICRP Version 4.1
- Revised Engagement Plan
- 2019 EAAR

ABORIGINAL AND COMMUNITY INVOLVEMENT

- Community engagement and attendance at TK Panel meetings will be affected by COVID-19 directives and safety measures. We will adapt our activities to carry out our plans safely.
- Attend Traditional Knowledge Panel meetings
- Engage Communities through Board members and community update meetings
- Assess implementation of TK Recommendations including assessment of Diavik response and follow-up

COMMUNICATIONS

- Annual Report
- Website
- Public Registry
- Facebook Page
- Meeting Summaries

GOVERNANCE

- Hold regular meetings in the context of COVID-19
- Oversee EMAB operations
- Implement Action Plan for 2019-24



AUDITED FINANCIAL STATEMENTS

To the Board of Directors of
Environmental Monitoring Advisory Board

Opinion

We have audited the financial statements of Environmental Monitoring Advisory Board, which comprise the statement of financial position as at March 31, 2020, and the statements of operations, changes in net assets and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the organization as at March 31, 2020, and its results of operations and its cash flows for the year then ended in accordance with ASNPO.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with ASNPO, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the organization's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Board or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the organization's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Board's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Board's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Board to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

EPR Yellowknife Accounting Prof. Corp.

EPR Yellowknife Accounting Professional Corporation
Chartered Professional Accountants
 Yellowknife, NT
 September 9, 2020

ENVIRONMENTAL MONITORING ADVISORY BOARD
Statement of Operations
For the year ended March 31, 2020

	2020 Budget	2020 Actual	2019 Actual
Revenues			
Diavik Diamond Mines Inc.	\$ 506,820	\$ 506,820	\$ 496,880
Interest income	7,000	6,976	5,918
Transfer from deferred revenue	39,575	39,575	69,254
Transfer to deferred revenue	-	(111,134)	(39,575)
Contributions repayable	-	(878)	(41,228)
	553,395	441,359	491,249
Expenditures			
Administration, Schedule 1	72,850	64,883	66,397
Management Services, Schedule 2	198,017	184,724	189,026
Governance, Schedule 3	95,883	93,640	100,186
Oversight and monitoring, Schedule 4	152,995	88,912	121,430
Involving and supporting communities, Schedule 5	24,100	391	2,623
Communications, Schedule 6	9,550	8,809	11,587
Amortization	-	1,904	2,720
	553,395	443,263	493,969
Surplus (deficit) before transfer of amortization	-	(1,904)	(2,720)
Other item			
Transfer to Tangible Capital Asset Fund	-	1,904	2,720
Surplus for the year	\$ -	\$ -	\$ -

ENVIRONMENTAL MONITORING ADVISORY BOARD
Statement of Changes in Net Assets
For the year ended March 31, 2020

	Operating Fund	Tangible Capital Asset Fund	Total 2020	Total 2019
Balance, opening	\$ -	\$ 6,348	\$ 6,348	\$ 9,068
Deficit	-	-	-	-
Amortization	-	(1,904)	(1,904)	-
<u>Amortization</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>(2,720)</u>
Balance, closing	\$ -	\$ 4,444	\$ 4,444	\$ 6,348

ENVIRONMENTAL MONITORING ADVISORY BOARD
Statement of Financial Position
As at March 31, 2020

	2020	2019
ASSETS		
Current		
Cash	\$ -	\$ 15,280
Restricted cash (Note 3)	666,514	620,167
Accounts receivable	-	274
Prepaid expenses	5,352	1,579
	671,866	637,300
Tangible Capital Assets (Note 4)	4,443	6,347
	\$ 676,309	\$ 643,647
LIABILITIES		
Current		
Bank indebtedness (Note 5)	\$ 13,816	\$ -
Accounts payable and accrued liabilities (Note 6)	29,077	49,676
Deferred revenue (Note 7)	628,094	546,395
Contributions repayable (Note 8)	878	41,228
	671,865	637,299
NET ASSETS (Note 1)		
Net Assets	4,444	6,348
	\$ 676,309	\$ 643,647

APPROVED ON BEHALF OF THE BOARD

 Member

 Member

ENVIRONMENTAL MONITORING ADVISORY BOARD
Statement of Cash Flows
For the year ended March 31, 2020

	2020	2019
Operating activities		
Surplus	\$ -	\$ -
Change in non-cash working capital items		
Decrease (increase) in accounts receivable	274	(274)
Increase in prepaid expenses	(3,773)	(492)
(Decrease) increase in accounts payable and accrued liabilities	(20,599)	17,850
Increase (decrease) in deferred revenue	81,699	(19,739)
(Decrease) increase in contributions repayable	(40,350)	41,228
Increase in cash	17,251	38,573
Cash, opening	635,447	596,874
Cash, closing	\$ 652,698	\$ 635,447
Cash consists of:		
Cash	\$ -	\$ 15,280
Restricted cash	666,514	620,167
Bank indebtedness	(13,816)	-
	\$ 652,698	\$ 635,447

1. ORGANIZATION AND JURISDICTION

Environmental Monitoring Advisory Board (the "Board") is a not-for-profit organization established as a requirement of the *Diavik Environmental Agreement*. It aims to provide a meaningful role for Aboriginal People in the review and implementation of environmental monitoring plans with respect to the Diavik Diamond Mine site in the Northwest Territories. The Board will be in place until full and final reclamation of the mine is complete.

The Board is exempt from income tax under section 149(1)(l) of the *Income Tax Act*.

2. SIGNIFICANT ACCOUNTING POLICIES

The Board applies the Canadian accounting standards for not-for-profit organizations.

(a) Financial instruments

The Board initially measures its financial assets and liabilities at fair value. The Board subsequently measures its financial assets and financial liabilities at amortized cost, except for securities quoted in an active market, which are subsequently measured at fair value.

Financial assets measured at amortized cost include cash and restricted cash. Financial liabilities measured at amortized cost include accounts payable and accrued liabilities.

At the end of each reporting period, management assesses whether there are any indications that financial assets measured at cost or amortized cost may be impaired. If there is an indication of impairment, management determines whether a significant adverse change has occurred in the expected timing or the amount of future cash flows from the asset, in which case the asset's carrying amount is reduced to the highest expected value that is recoverable by either holding the asset, selling the asset or by exercising the right to any collateral. The carrying amount of the asset is reduced directly or through the use of an allowance account and the amount of the reduction is recognized as an impairment loss in operations. Previously recognized impairment losses may be reversed to the extent of any improvement. The amount of the reversal, to a maximum of the related accumulated impairment charges recorded in respect of the particular asset, is recognized in operations.

(b) Fund accounting restricted

The Board uses fund accounting to segregate transactions between its Operating Fund and Tangible Capital Asset Fund. The Operating Fund accounts for the Board's operating and administrative activities. The Tangible Capital Asset Fund reports the assets, liabilities, revenues and expenses related to tangible capital assets.

2. SIGNIFICANT ACCOUNTING POLICIES, continued

(d) *Revenue recognition*

The Board follows the deferral method of accounting for contributions. Restricted contributions are recognized as revenue in the year in which the related expenses are incurred. Unrestricted contributions are recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and its collection is reasonably assured. Contributions which are not expensed in the current year are set up as deferred funding to be used in the future year when services are provided and goods acquired or refundable contributions that must be repaid to the contributor. Interest income is recognized on the basis of the time funds are in the account and interest is accrued.

(e) *Unexpended funds*

On January 16, 2011 an Arbitration Award findings resulted in a change in accounting policy for the recognition and treatment of unexpended funds. Previously the Board classified the unexpended funds as unrestricted net assets. Beginning in 2011, unexpended funds are classified as net unexpended contributions repayable or deferred revenue. The Board may not accumulate unrestricted net assets from unexpended Diavik Diamond Mines Inc.

(f) *Allocated expenses*

The Board allocates expenditures according to its activities. Expenditures are allocated to Administration, Management Services, Board, Science Program, Involving and Supporting Communities and Communication.

(g) *Cash and cash equivalents*

Cash and cash equivalents consist primarily of cash in chequing account and restricted cash.

(h) *Use of estimates*

The preparation of financial statements in conformity with Canadian accounting standards for not-for-profit organizations requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. By their nature, these estimates are subject to measurement uncertainty. The effect of changes in such estimates on the financial statements in future periods could be significant. Accounts specifically affected by estimates in these financial statements are .

3. RESTRICTED CASH

Restricted cash represents cash received from Diavik Diamond Mines Inc. that is intended for a specific purpose or represents the amount to repay.

	<u>2020</u>	<u>2019</u>
Cash received in advance for the 2020/2021 fiscal year	\$ 666,514	\$ -
Cash received in advance for the 2019/2020 fiscal year	<u>-</u>	<u>620,167</u>
	<u>\$ 666,514</u>	<u>\$ 620,167</u>

4. TANGIBLE CAPITAL ASSETS

			2020	2019
	Cost	Accumulated amortization	Net	Net
Office equipment	\$ 33,017	\$ 31,903	\$ 1,114	\$ 1,591
Furniture and fixtures	24,209	22,441	1,768	2,526
Computer equipment	60,895	59,334	1,561	2,230
	\$ 118,121	\$ 113,678	\$ 4,443	\$ 6,347

ENVIRONMENTAL MONITORING ADVISORY BOARD
Notes to the Financial Statements
March 31, 2020

5. BANK INDEBTEDNESS

The bank indebtedness balance represents the excess of outstanding cheques over the balance in the operating account as of the year-end date.

	<u>2020</u>	<u>2019</u>
Cash	\$ (13,816)	\$ 15,280

6. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

	<u>2020</u>	<u>2019</u>
Trade accounts payable	\$ 16,731	\$ 40,364
Accrued payroll	6,381	7,881
Government remittance	5,965	1,431
	<u>\$ 29,077</u>	<u>\$ 49,676</u>

7. DEFERRED REVENUE

	<u>2020</u>	<u>2019</u>
Diavik Diamond Mines Inc. - funding for next year	\$ 516,960	\$ 506,820
Diavik Diamond Mines Inc. - 2020 surplus	102,875	-
Diavik Diamond Mines Inc. - 2019 surplus	8,259	39,575
	<u>628,094</u>	<u>546,395</u>
	-	-
	<u>\$ 628,094</u>	<u>\$ 546,395</u>

8. CONTRIBUTIONS REPAYABLE

	2020	2019
Diavik Diamond Mines Inc. - repayable from 2019 funding	\$ 878	\$ 41,228

9. ECONOMIC DEPENDENCE

The Board is dependent upon funding in the form of contributions from Diavik Diamond Mines Inc. Management is of the opinion that if the funding was reduced or altered, operations would be significantly affected. Under the Environment Agreement, \$6M of funds is held to ensure that Diavik Diamond Mines Inc. meets all of its obligations.

10. FINANCIAL INSTRUMENTS

Interest rate risk

Interest rate is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Board's financial assets that are exposed to interest rate risk consists of cash and restricted cash. The cash flow from variable rate financial instruments fluctuate as market rates of interest change. The risk has not changed from the prior year.

Credit risk

Credit risk is the risk that a third party to a financial instrument might fail to meet its obligations under the terms of the financial instrument. The Board does have credit risk in cash of \$666,514 (2019 - \$635,447) with a chartered bank in excess of the insurable limit throughout the year. Furthermore, the Board has a concentration risk as the full balance of cash is maintained with a single federally regulated financial institution. This risk has not changed from the prior year.

Liquidity risk

Liquidity risk is the risk that the Board cannot repay its obligations when they become due. The Board does have a liquidity risk in the accounts payable and accrued liabilities. the Board reduces its exposure to liquidity risk by ensuring a budget process is in place and through monitoring of expenses. This risk has not changed from the prior year.

ENVIRONMENTAL MONITORING ADVISORY BOARD
Schedules of Expenditures
For the year ended March 31, 2020

SCHEDULE OF ADMINISTRATION

Schedule 1

	2020	2020 Actual	2019 Actual
Audit fees	\$ 10,500	\$ 7,980	\$ 11,146
Bank charges and interest	750	407	635
Bookkeeping fees	5,000	5,670	4,745
Capital equipment	1,000	-	-
Insurance	7,000	3,464	3,519
Janitorial	2,800	2,520	2,835
Library/Publications	200	-	-
Office supplies	2,600	2,337	2,267
Postage and freight	500	359	775
Printing and photocopy	2,600	2,037	2,038
Professional fees	1,000	2,553	-
Rent	31,500	31,500	31,500
Repairs and maintenance	300	192	53
Technical Support	500	-	-
Telephone and internet	6,600	5,864	6,884
	\$ 72,850	\$ 64,883	\$ 66,397

SCHEDULE OF MANAGEMENT SERVICES

Schedule 2

	2020	2020 Actual	2019 Actual
Employee benefits	\$ 18,000	\$ 18,930	\$ 22,666
Employer's costs - CPP, EI, WSCC	11,700	12,594	12,246
Professional development	5,200	913	-
Salaries	163,000	152,253	153,579
Travel	117	34	535
	\$ 198,017	\$ 184,724	\$ 189,026

ENVIRONMENTAL MONITORING ADVISORY BOARD
Schedules of Expenditures
For the year ended March 31, 2020

SCHEDULE OF GOVERNANCE

Schedule 3

	2020	2020 Actual	2019 Actual
Accommodations	\$ 6,500	\$ 8,971	\$ 6,571
Board of directors - Training	1,000	-	-
Executive Committee	4,650	4,650	4,500
Food and beverage	1,000	1,530	1,172
Honoraria	20,483	24,694	23,936
Meeting expenses	3,750	-	-
Per diems	5,450	4,028	4,615
Preparation	40,200	39,800	45,000
Teleconference honoraria	1,100	105	-
Transportation	11,000	9,862	8,323
Strategic Planning	-	-	6,069
Personnel committee	750	-	-
	\$ 95,883	\$ 93,640	\$ 100,186

SCHEDULE OF OVERSIGHT AND MONITORING

Schedule 4

	2020	2020 Actual	2019 Actual
Aquatic Effects Monitoring Program	\$ 20,000	\$ 19,981	\$ 42,220
Air Quality Management Program	6,100	7,222	16,431
Interim Closure and Reclamation	66,345	30,438	3,081
Other reviews and reports	49,512	22,118	44,867
Traditional Knowledge Panel Review	38	38	-
Wildlife Monitoring Plan	11,000	9,115	14,831
	\$ 152,995	\$ 88,912	\$ 121,430

ENVIRONMENTAL MONITORING ADVISORY BOARD
Schedules of Expenditures
For the year ended March 31, 2020

SCHEDULE OF INVOLVING AND SUPPORTING COMMUNITIES

Schedule 5

	2020	2020 Actual	2019 Actual
Board member consultation honoraria	\$ 3,000	\$ 391	\$ -
Kitikmeot Inuit Association	6,200	-	-
Lutsel K'e	5,600	-	2,623
North Slave Metis Alliance	1,800	-	-
T'licho Government	3,000	-	-
Yellowknives Dene First Nation	2,300	-	-
Board member consultation honorarium	2,200	-	-
	\$ 24,100	\$ 391	\$ 2,623

SCHEDULE OF COMMUNICATIONS

Schedule 6

	2020	2020 Actual	2019 Actual
Advertising, public relations and promotions	\$ 1,600	\$ 2,102	\$ 3,739
Annual report	7,950	6,707	7,650
Website maintenance	-	-	198
	\$ 9,550	\$ 8,809	\$ 11,587

EMAB RECOMMENDATIONS

EMAB RECOMMENDATIONS TABLE 2019 - 2020

AEMP Design Plan 5.1.

EMAB Submitted 17 recommendations to Diavik via the WLWB on AEMP Design Plan 5.1. Highlights can be found on pages 22-26. The complete list of recommendations can be found on the WLWB Public Registry.

WRSa Closure and Reclamation Plan - Cover Modification Request

EMAB submitted 6 recommendations on Diavik's request to modify the cover of the WRSa. Highlights can be found on pages 43-44. The complete list of recommendations can be found on the WLWB Public Registry.

WRSa Closure and Reclamation Plan - Instrumentation Location 4

EMAB submitted 8 recommendations to Diavik via the WLWB on Diavik's instrument location #4 proposal. Highlights can be found on page 43. The complete list of recommendations can be found on the WLWB Public Registry.

Community Engagement Plan Ver. 3.0.

EMAB submitted 13 recommendations to Diavik via the WLWB on Diavik's Community Engagement Plan Ver. 3.0. Highlights can be found on pages 31-32. The complete list of recommendations can be found on the WLWB Public Registry.

2018 EAAR

EMAB submitted 8 recommendations to Diavik on the DRAFT 2018 EAAR. Diavik addressed most of the recommendations so EMAB did not comment on the Final Version of the 2018 EAAR. Highlights can be found on page 55. The complete list of recommendations can be found on our website: emab.ca.

Water Licence Amendment Application - PK to Pits

EMAB made 51 recommendations during the MVEIRB intervention for Diavik's Water Licence Amendment Application to Deposit PK in the Mine Workings. Highlights can be found on pages 28-30. The complete list of recommendations can be found on the MVEIRB Public Registry.

Water Licence Amendment Application - A21 Deep

EMAB made 6 recommendations on Diavik's Water Licence Amendment Application to mine underground at A21. Highlights are on pages 30-31. The complete list of recommendations can be found on the WLWB Public Registry.

Draft TOR - Independent Review Panel for PK to Pits Water Quality Modelling

EMAB recommended 4 independent experts to sit on the PK to Pits Water Quality Modelling Independent Review Panel. More information can be found on the WLWB public registry. Highlights are on page 30 of this report.

2018 EAQMP Report

EMAB submitted 10 recommendations to Diavik on the 2018 EAQMP Report. Highlights can be found on pages 53–55. EMAB's recommendations and Diavik's responses are listed below. EMAB's technical review of this document can be found on our website, www.emab.ca.

EMAB Recommendation	Diavik Response
It is recommended that DDMI include (and adhere to) a detailed summary of QA/QC practices in the EAQMP Report for each aspect of the monitoring program, including all laboratory procedures.	A detailed summary of QA/QC practices for TSP monitoring is already included in the 2018 EAQMP Report. Summaries will be included for the dustfall gauges and snow core surveys program (including all associated laboratory procedures) in the 2019 EAQMP report.
Complete and final calibration records be provided for all equipment (i.e., laboratory scale, continuous monitoring equipment, etc.).	Complete and final calibration records for TSP monitoring equipment and laboratory scales will be provided as part of the 2019 EAQMP report (the 2019 Report). If calibrations are not performed to the frequency required by relevant SOPs a rationale will be included for missed calibration events.
Final SOPs be provided for all field sampling and laboratory methods.	SOPs for dust gauge collection, snow core survey, and quality assurance/quality control methods were included in the 2018 Dust Deposition Report attached to the 2018 EAQMP Report. Versions currently in use will be included in the 2019 Report, as well as current versions for TSS Analysis, and TSP monitoring.
The dust gauge collection SOP be updated to include QA/QC requirements similar to the QA/QC procedure used for snow core sampling (i.e., field duplicates and blanks).	The dust gauge collection SOP will be updated to include a section on QA/QC requirements. Equipment blanks can be included as in the snow core sampling procedure. DDMI notes that dust gauge stations at equivalent distances from the mine perimeter serve a similar purpose to field duplicates. At this time, DDMI does not expect additional field duplication is required. DDMI particularly notes the close proximity of Dust 3 and Dust 2A to each other and to mine infrastructure. DDMI also notes that field duplicates collected during the snow core dust program already provide a good reference to very close proximity duplication of dust deposition rates. Lab blanks will be added to both dust gauge and snow core sampling SOPs to reflect existing QA/QC procedures for total suspended solids laboratory analysis.
Quality checking procedures need to be added to the TSS SOP (if not already) to ensure that they meet the same standard that an accredited laboratory would meet.	The TSS SOP can be provided in the 2019 EAQMP Report. The TSS SOP incorporates all the QA/QC procedures required by an accredited laboratory (based off of standards for the Canadian Association for Laboratory Accreditation), including systematic and documented analyst training, the use of regular lab blanks and standard checks, routine calibrations and verifications of analytical balance, and routine temperature verifications of drying oven.
Consider returning to monthly dustfall sampling or, at a minimum, perform monthly sampling during the snow-free periods, to evaluate effectiveness of dust suppression efforts.	Dustfall sampling is currently undertaken on a quarterly basis, with sample collection occurring in March, June, September and December. Q1 and Q4 samples both represent periods of frozen conditions where less dust is expected, while Q2 and Q3 both include thawed periods with varying degrees of dust suppression activity. DDMI intends to present an analysis of effectiveness of dust suppression activity based on current and historical dust deposition data and dust suppression activity logs at the upcoming air quality monitoring workshop. The resulting discussion should help parties agree on the effectiveness of dust suppression efforts. Based on the information available at this time, DDMI does not consider the 4-fold increase in effort and cost to complete monthly dustfall sampling is justified.
The current and historical dustfall monitoring results be used to evaluate the effectiveness of dust suppression efforts.	DDMI intends to present an analysis of effectiveness of dust suppression activity based on current and historical dust deposition data and dust suppression activity logs at the upcoming air quality monitoring workshop.
Available meteorological data and records of on-site activity be used to document the cause/ rationale for events of high TSP concentration measured by the monitors.	It is not clear what events of high TSP concentration are referenced. In 2018, there were zero exceedances of the GNWT-ENR Guideline for Ambient Air Quality Standards, and no clear trends indicating periods of elevated concentration. DDMI requests clarification on what is considered an event of high TSP concentration.

A detailed comparison of monitored and modelled TSP/dustfall be included within the AQMR.	DDMI intends to present a comparison of monitored versus modelled TSP/dustfall at the upcoming air quality monitoring workshop. DDMI notes that the air dispersion model was designed to conservatively estimate (i.e., overestimate) airborne dust because that was expected to be the component that would more acutely impact people and wildlife. This approach indirectly underestimated dust deposition onto land and water. This approach is considered acceptable because the effects to those valued components of the environment are closely monitored through the Aquatic Effects Monitoring Program and Lichen and Vegetation Program.
Details of the NPRI and GHG calculations be included, or a reference to an external document containing such details, to allow for validation of methods and quantities reported.	NPRI and GHG calculation details are determined by Environment and Climate Change Canada (ECCC). Links to ECCC calculation toolboxes will be included in the 2019 Report.

Miscellaneous EAQMP Recommendation

EMAB made an additional recommendation to Diavik to be considered for the EAQMP. The recommendation and response is listed below. More information on the EAQMP recommendations can be found at www.emab.ca.

EMAB Recommendation	Diavik Response
DDMI-EAQ-15 Sample the yellow haze and report on its chemical make-up and concentration, or develop a program to sample it.	<p>DDMI notes that it is unaware of a “yellow haze” at the Diavik Mine and is uncertain about EMAB’s source of this information. DDMI has not observed a “yellow haze” above the Diavik Mine nor provided a record of such an event in any monitoring report. For these reasons, DDMI is not able to develop a program to sample it and report on the chemical make-up.</p> <p>Regarding EMAB’s theory that combustion gases, particularly nitrogen dioxide (NO₂), may be responsible for the apparent “yellow haze” event at Diavik, DDMI notes the following project predictions, monitoring and adaptive management:</p> <ul style="list-style-type: none"> • The 1999 Diavik Environmental Assessment Report predicted the Diavik Diamond Mine Project would not have a significant effect on air quality. • DDMI’s 2012 Air Dispersion Modelling Assessment for the Diavik Mine predicted that maximum 24-hour concentrations of NO₂ is lower than the air quality criteria in the vicinity of the Diavik Mine. • Annually, DDMI reports on NO₂ output as part of the Federal National Pollutant Release Inventory (NPRI) program and summarizes this information in the Annual Air Quality Report. NPRI substance emissions are derived by DDMI using emission factor calculations in Environment and Climate Change Canada’s NPRI Toolbox. Results are tracked year-over-year and any changes in trends are explained as part of the NPRI reporting requirements. • DDMI monitors the receiving environment that is potentially impacted by air emissions through the Aquatic Effects Monitoring Program and the Lichen and Vegetation Program. • DDMI continues to implement environmental programs and site-wide initiatives to reduce NO₂ emissions to the atmosphere, including the following: <ul style="list-style-type: none"> › Installation of four (4) wind turbines (4 x 2.3 MW), reducing annual diesel fuel consumption by approximately 10 percent. › Implementation of policies that limit vehicle idling and reduce overall vehicle count at the Diavik Mine. › Use of ultra-low Sulphur (approximately 4.3 parts per million) diesel fuel. › Aircraft/flight optimization to reduce air traffic. › Use of heat recovery systems in electrical generators. › Utilizing incinerators designed as best available technology. <p>In summary, DDMI monitoring programs have not recognized significant impacts to the environment linked to air emissions. Despite stable environmental conditions, the operation continuously strives to improve management controls at the Diavik Mine to mitigate potential impacts to the environment, including air quality. In the future, DDMI encourages EMAB to bring forward recommendations of additional measures to improve existing mitigation efforts, where possible.</p>

EAQMP Re-Evaluation

EMAB re-submitted 4 recommendations to Diavik on their EAQMP Re-evaluation. The recommendations were resubmitted because Diavik did not adequately respond the first time they were submitted. Highlights can be found on pages 52-53. EMAB's recommendations and Diavik's responses are listed below. More information on EAQMP recommendations can be found at www.emab.ca.

EMAB Recommendation	Diavik Response
Diavik continue to collect TSP data as set out in the currently approved EAQMP until a revised EAQMP has been finalized, reviewed and agreed to by EMAB, GNWT and other Parties to the Environmental Agreement.	An update to DDMI's Environmental Air Quality Monitoring and Management Plan (EAQMMP), Version 2 was submitted in January of 2019. The purpose of the EAQMMP V2 was to remove continuous total suspended particulate (TSP) monitoring while maintaining the other elements of DDMI's air quality monitoring and management programs. That submission provided the rationale for the change. DDMI considers the EAQMMP Version 2 to be finalized.
The TSP monitor locations should be re-evaluated using historical meteorology and dustfall results, as the TSP monitor results do not appear to be correlated with the 2016, 2015 and 2014 meteorology or dustfall monitoring results presented	The TSP Sampler Assessment Memorandum (TSPSAM 2018) addressed the location of TSP monitoring. In addition, the year-to-year variations in wind, as seen through small changes in annual wind roses, have not justified moving monitoring stations. The winds near the mine site tend to be omnidirectional with no dominant wind directions. Therefore, there is not one dominant upwind or downwind wind direction year-over-year. The referenced TSP locations for monitoring were based on modelling from 2012 that used the year of maximum emissions to help site TSP monitoring stations that were well placed to assess the effects of emissions from the mine site including the A21 pit area. Refer to DDMI-EAQ-14 for general updates related to TSP monitoring.
The dustfall sampling frequency be reviewed and completed on a monthly basis per ASTM International methods.	Quarterly dustfall monitoring results do not indicate that a benefit to adaptive management of dust on site would be realized if monitoring frequency was updated to be monthly. DDMI currently employs a variety of controls to reduce dust generation (enclosed rock crusher, vehicle reduction program, watering roads during summer months, dust suppressants on the airport taxiway and helipad) which DDMI intends to continue. Please refer to DDMI-EAQ-6 for more information.
Diavik should update the 2012 dispersion modelling assessment to reflect current operations. This assessment should then be used to evaluate the appropriateness of TSP monitor locations and assess the observed dustfall patterns.	It is not feasible or valuable to update the modelling based on yearly changes in mine footprint, mine operations or yearly variations in winds. As detailed in previous submissions to EMAB, monitoring data demonstrates that TSP monitoring is no longer required.

2019 WMP Report

EMAB submitted 13 recommendations to Diavik on the 2019 WMP Report. Highlights can be found on pages 45-51. As per section 4.3. of the EA, Diavik is required to respond to recommendations within 60 days of their receipt. At the time of writing this report we have not received Diavik's response, which is due on August 25 2020.

EMAB Recommendation

DDMI-WMP-5

We recommend examining coefficients with 85% confidence intervals as well, which will allow for interpretation of potentially informative variables that may be discarded with 95% confidence intervals (Arnold, 2010; Conkling et al. 2015).

DDMI-WMP-6

We recommend DDMI include a graph of caribou density by distance, and a statistical analysis of the relationship, in an addendum to the WMR to support their assertion that caribou density increases with distance from the mine.

We also recommend DDMI include a discussion of the ecological significance of the findings and not just the statistical significance of the caribou by distance relationship.

We recommend discussing effect sizes and the ecological significance of all modelling results presented in this section.

DDMI-WMP-7

We recommend DDMI provide additional discussion of the ecological reasoning for including month as a covariate in the models, because although the total abundance of caribou in the study area varies by month, it is unclear how that relates to the pattern of caribou abundance with distance to the mine, which is the focus of this analysis.

DDMI-WMP-8

We recommend DDMI include another candidate model with all covariables except preferred habitat and the interaction of distance*habitat in order to see how distance performs in predicting caribou abundance.

DDMI-WMP-9

We recommend DDMI provide additional discussion to clarify whether or not the variables included in the candidate models were standardized per unit area. If not, can DDMI explain why they did not standardize variables per unit area. And if they did, can they please provide further discussion about what distance means in the context of their mixed-model analysis since they controlled for the increasing amount of sampling area with distance from the mine.

DDMI-WMP-10

We recommend DDMI utilize the existing satellite collar data for a ZOI analysis based on spatial variation of selection ratios for inclusion in the 2020 monitoring report (or an addendum to the report).

DDMI-WMP-11

We recommend that DDMI continue their efforts to collect caribou behaviour data annually (see also DDMI-WMP-16).

DDMI-WMP-12

We recommend the continuation of the snow tracking program to monitor impacts of the mine on wolverine detectability, occupancy, colonization and extinction.

DDMI-WMP-13

We recommend that a schedule for future hair snagging be determined in collaboration with GNWT-ENR. Given the findings of the MSOM which shows distance to the Mines affects wolverine occupancy, ongoing monitoring of population size and stability would be prudent to ensure negative impacts of the Mines on wolverines does not lead to population extinction.

DDMI-WMP-14

In order to alleviate any remaining concerns about dust impacts, we recommend that DDMI continue to monitor indirectly impacted vegetation plots outside of reclaimed areas to evaluate how quickly the residual effects of dust are resolved after reclamation activities/post-operations.

DDMI-WMP-15

We recommend DDMI provide additional information on their intentions for reinstating ZOI monitoring and potential methods. Also see DDMI-WMP-5 to DDMI-WMP-10.

DDMI-WMP-16

If possible, please clarify why there is no behaviour data from the Ekati mine for the years 2017–2019 (e.g. are they not collecting data during the winter season or are they not seeing caribou?).

We recommend DDMI evaluate whether the data can be pooled and analyzed while considering covariates such as year, gender, and distance to the Mine.

We recommend DDMI compare caribou running bouts as a function of distance. Please also consider grouping or separating running and trotting activities for the analysis.

DDMI-WMP-17

We recommend Diavik answer the following questions:

If predictions calculated paths of least resistance in terms of energetics, why doesn't the monitoring program evaluate the energetic cost of migration? This would be more informative than counting East/West deflections.

Do changes in migration have a consequence for caribou energetics: Can we compare the predicted development scenario ("cost-of-movement index") with what is there now? Is the cost of movement as predicted? Do current pathways used by caribou have higher, same, or lower energetic cost ("cost of movement index") than baseline and predicted scenarios?

Regarding the potential influence of the mine specifically (i.e., mechanisms):

- Did the southern migration change at a time of new infrastructure (e.g. new pit)?
 - Did important corridors become dysfunctional?
 - Does dust deposition increase energetic costs of migration? (Is dust higher on one side of the mine? What is the prevalent wind direction? Is foraging better going west for fall migration?)
-

Miscellaneous WMP Recommendations

EMAB made an additional 4 recommendations to Diavik to be considered for the Wildlife Monitoring Program. The recommendations and responses are listed below. More information on the WMP recommendations can be found at www.emab.ca.

EMAB Recommendation	Diavik Response
<p>DDMI-WMP-4</p> <p>Diavik should hold a workshop with the TK Panel, EMAB and GNWT-ENR to collaborate on the development of the Wildlife Monitoring Program Description.</p>	<p>DDMI does not plan to hold a Wildlife Management and Monitoring Plan (WMMP) workshop specific to the Diavik Mine. It is our opinion that a forum for a broader discussion on potential emerging issues related to wildlife monitoring in the Northwest Territories is the appropriate avenue to address EMAB's recommendation. DDMI notes that the Government of Northwest Territories (GNWT), through the Slave Geological Province Wildlife Monitoring Workshop, is already addressing this issue.</p> <p>DDMI's annual wildlife monitoring program reports (WMPs) for the Diavik Mine have been regularly reviewed by stakeholders, including EMAB and the Government of Northwest Territories Department of Environment and Natural Resources (GNWT-ENR). DDMI has also discussed these WMPs with panel membership at Diavik's Traditional Knowledge Panel sessions. Review comments and recommendations from stakeholders, including EMAB, on these annual reports have covered various elements of wildlife monitoring program design and wildlife monitoring results. These reviews have informed DDMI's adaptive management and subsequent annual updates to these monitoring programs.</p> <p>As noted in DDMI's February 21, 2020 response to EMAB's request for a wildlife monitoring program description for the Diavik Mine, we plan to prepare a WMMP document by June 2020 to align with the current Water Licence Amendment process. The WMMP will describe the approved wildlife monitoring already completed and documented by DDMI in the most current Annual WMP. The document will align with the GNWT's Wildlife Management and Monitoring Plan guidelines. DDMI appreciates that a separate and shorter Program Description will make it easier for EMAB and reviewers to identify all programs completed by DDMI. As per GNWT guidelines, this WMMP will be updated every five (5) years or during each Water Licence Renewal or Amendment process. For instance, DDMI will update the WMMP to incorporate any new or altered monitoring requirements identified because of the A21 Below Pit or the Processed Kimberlite to Mine Workings Water Licence Amendments.</p>
<p>DDMI-WMP-1</p> <p>Diavik should include TK reporting in WMP Annual Reports and ensure that TK is highlighted in future WMP presentations. Diavik also should explain how and where TK Panel recommendations are incorporated into the WMP. Side-by-side tables that show how science and TK are incorporated into each WMP component would be a useful way to present this information.</p>	<p>Section 2 of the 2018 WMP highlights how Traditional Knowledge (TK) has been incorporated into wildlife monitoring programs for caribou habitat, grizzly bear, and wolverine. Specifically, DDMI incorporates TK through:</p> <ul style="list-style-type: none"> • Study design; • Wildlife ecology and the interpretation of monitoring results; and • Community participation in data collection. <p>DDMI plans to continue to involve members of some of our Participation Agreement communities in wolverine snow track surveys. Diavik is also updating the wolverine snow track survey sample sheet to explicitly capture TK feedback about each survey transect.</p> <p>Further, as noted in DDMI's February 21, 2020 letter to EMAB, DDMI also intends to present descriptions of the monitoring program(s) for wildlife in a stand-alone Wildlife Management and Monitoring Plan (WMMP) document by June 2020.</p>

DDMI-WMP-2 Please clarify the difference between bear sightings and bear observations, including why the recorded numbers of sightings versus observations were different in the 2018 WMP.	Section 5.3.2 and Appendix J of the 2018 WMP Report both reference 90 reported instances of grizzly bears on East Island with a total of 128 grizzly bears observed (Table 7 and Appendix J). The difference between the two numbers is that some “reported instances” contained multiple “observed” bears. For example, the sow and two cubs on 15 September 2018 is one reported instance of grizzly bears with three observed bears.
DDMI-WMP-3 Please clarify when the next comprehensive wolverine analysis will take place.	The next comprehensive wolverine analysis will be part of the 2019 comprehensive report to be submitted in 2020.

2018 WMP Report

Last year, EMAB submitted 7 recommendations to Diavik on the 2018 WMP Report. At the time of writing last years’ report we had not received Diavik’s responses. Diavik submitted their responses 7 days late on November 1, 2019. As per section 4.3 of the EA, Diavik is to respond to all recommendations within 60 days. The complete list of recommendations and Diavik’s responses are below. Detailed technical reviews can be found on our website, www.emab.ca, and highlights are in the EMAB 2018/2019 Annual Report.

EMAB Recommendation	GNWT Response
Opportunities for improvement of existing mitigation measures that alleviate noise, dust, light, sounds, smell, and human presence may arise with technological advances and should be implemented to help minimize indirect impacts on caribou habitat.	DDMI is not aware of any technological advancements for dust suppression or techniques being used at other mines that exceed those implemented at the Diavik site. Diavik Mine already uses accepted best practices as part of mitigation designs and to meet regulatory guidelines. Mitigation for fugitive dust deposition at Diavik includes keeping the footprint small, use of low speed limits on roads and watering of roads during summer months under dry conditions. Similar methods are used to suppress dust at Ekati mine. EK-35 dust suppressant is applied to the airport taxiway and helipad. In 2019 a second water tree was installed near A21 to decrease water truck cycle times and improve road watering effectiveness. In 2020, DDMI intends to complete a study on dust suppressants in parking lots to reduce fugitive dust production.
DDMI has committed to provide a table summarizing sample sizes of caribou behavioural data including categories for mine operator, type of scan, season, distance from mine, and year in the next WMR. Please organize the information on distance from mine into categories of less than and greater than 15 km from the mine (please see the example table below for a suggested format).	It should be noted by EMAB that Diavik has already provided a table in Appendix B of the 2018 WMP (Golder 2019) that summarized behaviour data by mine operator (Diavik versus Ekati), scan type, season, distance from mine and year. Diavik has also provided more detailed information on the frequency of distances sampled by year (Appendix A, Figure 2) in Golder (2019). This information demonstrates that very few behaviour observations have been collected at varying distances annually since the last analysis of these data and also show there are numerous gaps in the distance from mine distribution across time (Golder 2011). In their review of the 2018 WMP, MSES has provided additional information, which requests a summary by distance strata (i.e., within and beyond 15 km from mines). Summarizing by distance strata was not explicitly requested previously. The requested summary will be provided as an appendix to the 2019 WMP report.
In response to the 2017 WMP, EMAB recommended that “Diavik should continue to focus on conducting far-from-mine behavioural group scans to ensure data are balanced between Ekati’s near-mine scans and far-field scans, and to be in line with the original intent of this WMP component.” (EMAB 2019a). Please explain why only 4 samples were collected far-from-mine in the 2018 season.	DDMI will continue to collect caribou behaviour data when caribou are present in the study area and when it is safe for staff to do so. As DDMI has stated previously, caribou are now most common in the study area during winter when the ability to implement far field data collection is constrained by extreme environmental conditions.

<p>We recommend that DDMI provide summaries for other activities, particularly activities with a high energetic cost.</p>	<p>A summary of behaviour activities recorded will be included as an appendix in the 2019 WMP report.</p>
<p>Please provide a discussion regarding the original intent behind the predictions regarding the northern and southern migrations (i.e. please clarify if the original prediction related to the connectedness of the herd, change in the movement (and thus energetics) of the herd, or any other concepts). Please explain why a deflection test was selected to test predictions regarding caribou distribution since predictions were not followed but DDMI can still conclude no effect of the Mine.</p>	<p>The predictions were based on a least-cost path (friction) analysis completed in the EER (Diavik 1998). The movement cost for different factors (e.g., terrain type and ruggedness, predation cover, forage availability) was based on expert opinion. Out of 10 simulated paths for baseline for fall migration, five (50%) paths moved around the eastern side of Lac de Gras, one (10%) path traversed Lac de Gras via East Island and four (40%) paths moved around the western side of Lac de Gras (Appendix A). Thus, there were generally more paths expected east of Lac de Gras than west during the fall migration, but the difference is small. The path associated with East Island was predicted to be lost due to the development of Diavik Mine, which monitoring has verified (collared caribou have not used this path since construction but have apparently moved across Lac de Gras). Baseline studies from 1995 and 1996 also mapped caribou movements for fall around Lac de Gras (Appendix A). The results from collared caribou do not show a strong overall departure from the patterns predicted for baseline. More importantly, they do not support that deviation from EER predictions leads to population-level consequences such as fragmentation of the herd.</p>
<p>We recommend that the question of the influence of mining on caribou distribution remains “on the table” through the annual collection and evaluation of GPS-collar data. Please provide ideas on how DDMI can continue to monitor changes in herd distribution specifically in relation to the Diavik mine using collar data, if DDMI is proposing to remove the deflection test.</p>	<p>Environmental assessment is focussed on whether effects have ecological significance, which may not always be easily measurable (like energy expenditure of free-ranging caribou). East-west movements by collared caribou were used as a measurement indicator for EER predictions from a least-cost path analysis that was based on expert opinion. The availability of collared caribou allow for examination of whether the pattern of change in movements results in a ecological effect, such as population fragmentation (which it does not). The EER predictions indicated 60% (6 of 10 paths) of caribou post-development would move east around Lac de Gras and monitoring results indicate overall 43% do. DDMI believes there is little value in continuing this monitoring if the long-term results do not indicate a strong departure from predictions and or an ecological consequence. As well in this case, the monitoring does not directly inform on Mine operation. Instead of continuing to measure collared caribou deflections, DDMI will report seasonal spring and autumn range attributes (area, centroid and fidelity) for the Bathurst caribou herd based on collar data.</p> <p>It is important to note that due to the proximity of the Ekati Mine (e.g., Misery pit and haul road and Jay haul road, Diavik Mine is on East Island), it is problematic to separate the incremental changes in caribou distribution for the two mines.</p>
<p>We recommend that DDMI explore opportunities and options to mitigate dust deposition, which may be influencing caribou migration patterns according to TK. This could include a coordination of best management practices for all mining operations in the vicinity. Are there any technological advancements for dust suppression or techniques being used by other mine operations in the NWT that could be implemented at the Mine site?</p>	<p>DDMI is not aware of any technological advancements for dust suppression or techniques being used at other mines that exceed those implemented at the Diavik site. Mitigation for fugitive dust deposition at Diavik includes keeping the footprint small, use of low speed limits on roads and watering of roads during summer months under dry conditions. Similar methods are used to suppress dust at Ekati mine. EK-35 dust suppressant is applied to the airport taxiway and helipad. In 2019 a second water tree was installed near A21 to decrease water truck cycle times and improve road watering effectiveness. In 2020, DDMI intends to complete a study on dust suppressants in parking lots to reduce fugitive dust production.</p>




TABLE OF ACRONYMS

Acronym	Definition
AEMP	Aquatic Effects Monitoring Program
AGM	Annual General Meeting
BCRP	Bathurst Caribou Range Plan
CAR	Comprehensive Analysis Report
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations & Northern Affairs Canada
CSR	Comprehensive Study Report
DDEC	Dominion Diamond Ekati Corporation
DFO	Department of Fisheries and Oceans
EAAR	Environmental Agreement Annual Report
EAQMP	Environmental Air Quality Monitoring Program
ECCC	Environment and Climate Change Canada
ED	Executive Director
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Statement
EMAB	Environmental Monitoring Advisory Board
ENR	Environment and Natural Resources
EPA	Environmental Protection Act
EQC	Effluent Quality Criteria
FF	Far-Field
GNWT	Government of the Northwest Territories
ICRP	Interim Closure and Reclamation Plan
KIA	Kitikmeot Inuit Association
LdG	Lac de Gras

Acronym	Definition
LKDFN	Lutselk'e Dene First Nation
MDMER	Metal and Diamond Mining Effluent Regulations
MVLWB	Mackenzie Valley Land and Water Board
NCRP	North Country Rock Pile (aka NWRSA – see below)
NF	Near Field
NI	North Inlet
NSC	North South Consultants
NSMA	North Slave Metis Alliance
NWRSA	North Waste Rock Storage Area (aka NCRP or WRSA)
PHC	Petroleum Hydrocarbons
PK	Processed Kimberlite
PKC	Processed Kimberlite Containment Facility
PKMW	PK to Mine Workings
SEC	Slater Environmental Consulting
SGP	Slave Geological Province
SNP	Surveillance Network Program
SOI	Substance of Interest
SWRSA	South Waste Rock Storage Area
TG	Tłıchǫ Government
TK/IQ	Traditional Knowledge / Inuit Qaujimajatuqangit
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
TTG	Technical Task Group
WLWB	Wek'èezhìi Land and Water Board
WMP	Wildlife Monitoring Program
WMR	Wildlife Monitoring Report
WRRB	Wek'èezhìi Renewable Resources Board
WTA	Waste Transfer Area
YKDFN	Yellowknives Dene First Nation
ZOI	Zone of Influence





Working with *the* People *for the* Environment

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