ENVIRONMENTAL MONITORING ADVISORY BOARD FOR THE DIAVIK MINE

Working with the People for the Environment



ANNUAL 2021 2022 REPORT

oto courtesy of Diavik Diamond Mine



ENVIRONMENTAL MONITORING ADVISORY BOARD FOR THE DIAVIK MINE

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REPORT CARD ON THE ENVIRONMENT



PURPOSE

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 21-29 for more details]

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

Highlights for 2021/2022:

- Diavik continues to cause nutrient enrichment in Lac de Gras.
 - > Nutrient enrichment is caused by an increase of phosphorus and nitrogen in Diavik's effluent discharged into LdG.
 - More nutrients in fresh water leads to an increase in chlorophyll *a*, and feeds the growth of algae, which can be harmful to fresh water ecosystems.
- Nutrient enrichment is variable in Lac de Gras.
 - > 44% of the lake in 2016, 26% in 2017, 15% in 2018, 0.1% in 2019, 22% in 2020 and **100% in 2021**.
 - » Predicted extent was 20% of Lac de Gras.
 - » EMAB will continue to monitor the extent of nutrient enrichment in LdG.
 - EMAB would like Diavik to take samples from all areas of LdG every year. Right now, Diavik only samples the far-field every three years.

FISH AND AQUATIC LIFE [see pages 21-29 for more details]

There are many kinds of aquatic life in LdG. Aquatic life can be useful indicators of aquatic health. They are also food for fish. Diavik measures plankton (microscopic plants and animals that live in the water) and benthics (bugs that live on the bottom of the lake) to assess aquatic health. Monitoring results for fish and other aquatic life are within water licence limits, and predictions, although Elders at a TK Fish Camp in 2021 refused to eat fish from Lac de Gras because they considered them unhealthy.

Highlights for 2021/2022:

- Diavik measures plankton biomass and benthic invertebrates:
 - Diavik monitors amounts and types of plankton and benthic invertebrates because they are good indicators of ecosystem health.
 - There are different types of plankton near the mine compared to farther away, as well as a larger amount of plankton and a higher number of benthic invertebrates, because of increased nutrient levels where the mine discharges treated water.

- Fish eat benthics, so changes in the number and type of benthics can affect fish populations.
- Diavik conducted a Traditional Knowledge Fish Camp in 2021 on the mainland shore east of the mine.
 - The purpose was for Elders to do fish palatability testing to assess whether fish have changed.
 - In 2021 all the Elders refused to eat the fish due to concerns about their condition and health.
 - > EMAB plans to follow up the results.

WILDLIFE [see pages 44-49 for more details]

Diavik monitors caribou, grizzly bear, wolverine, raptors and the vegetation they feed on through a Wildlife Monitoring Program (WMP). In general the mine's effects on these animals and plants are within the predictions Diavik made during the environmental assessment. While the Bathurst caribou population has declined from 186,000 animals in 2003 to 6,240 in 2021, we don't know how much is caused by the mine.

Highlights for 2021/2022:

 Diavik (and other mines) have a Zone of Influence (ZOI) that caribou tend to avoid. A ZOI



would include disturbances such as traffic volumes, and loud noises.

- There are much fewer caribou around the mine than in the past. This is likely because the number of caribou has declined, and the remaining animals stay further north than they used to.
- Diavik says, there is no caribou ZOI around the mine.
 - EMAB and GNWT say Diavik's analysis is flawed. Previous scientific studies that use aerial survey and satellite collar data show a ZOI around the mine of about 14 km, varying from year to year.
 - EMAB recommended that Diavik use more advanced methods for ZOI surveys, such as reinstating the aerial surveys, using satellite collar data, or the use of drones.
- There is now a nine-year gap in caribou behavioral data analysis because Diavik is struggling to collect enough data.
 - There are less caribou around the mine, and they tend to mostly be in the area in the winter when it is too cold to be safe for Diavik staff to observe them.
- Diavik has proposed ending grizzly bear and wolverine hair snagging programs because the populations seem stable.
 - > EMAB recommended Diavik work with the GNWT to develop triggers for future hair snagging programs, to make sure populations remain stable.
- Vegetation near the mine has much more dust on it than vegetation far from the mine. Vegetation near the mine has changed in abundance and type with greater richness near the mine.
- GNWT required Diavik to submit a new Wildlife Management and Monitoring Plan under new wildlife regulations. GNWT reviewed the plan and circulated it to EMAB and communities for review.
 - > EMAB recommended Diavik continue monitoring the ZOI for caribou, and find ways to make it smaller.
 - > EMAB also recommended continuing the grizzly and wolverine hair snagging.

AIR QUALITY [see pages 50-53 for more details]

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

Highlights for 2021/2022:

- Total Suspended Particulate (TSP) monitoring was removed from the EAQMP in 2020; TSP is a very important variable that is made up of dust and air emissions.
 - > TSP comes from sources like exhaust from mine operations, and dust particles produced from blasting rock and road traffic.
- EMAB disagreed with Diavik removing TSP monitoring, and submitted a request for the Minister of ENR to review Diavik's EAQMP in 2020.
 - > ENR said it will do the review but has delayed the completion date to early 2023.
- EMAB has recommended Diavik take samples of the yellow haze that blankets the mine on very cold days. Diavik is waiting for the GNWT program review before deciding what to do.
- EMAB recommended that GNWT's Draft Air Quality Guideline require TSP monitoring near open pits, roads and crushers. EMAB also recommended a requirement to use equipment adapted to cold northern temperatures.

CLOSURE PLANS [see pages 39-44 for more details]

[see pages 39-44 for more details]

Diavik will submit its Final Closure and Reclamation Plan (FCRP) near the end of 2022. The Plan will include some critical designs, including the PKC Closure Design, the Revegetation Design and the South WRSA Closure Design. The most recent Interim Closure and Reclamation Plan from 2019 (ICRP 4.1 – see 2020-21 & 2019-20 Annual Reports) included much more detail than previous versions. It was approved by the WLWB with direction to Diavik to make a number of significant changes when submitting the FCRP.

Highlights from 2021/2022:

- Delays in submissions Diavik has been proposing to submit the designs for PKC Closure, Revegetation and the South Waste Rock Pile since 2020. These have now been delayed until submission of the FCRP.
- Delays in TK Monitoring Plan Diavik has informed EMAB that it will not submit a TK Monitoring Plan with the FCRP and plans to develop a TK Watching Program through a competitive bidding process with communities.
- The MVLWB updated its Closure Cost Estimation Guidelines. They included updated guidance on security holdbacks for performance. In general EMAB is pleased with the revised Guidelines.
- The WLWB directed Diavik to revise its security estimates following the review of ICRP 4.1. Diavik's security under the water licence now stands at almost \$200 million dollars.
- Diavik submitted a request for security refund for the North Waste Rock Storage Area, and Removal of Treatment Chemicals. Diavik withdrew the request due to concerns about the number of discrepancies compared to the cover design (e.g. thickness of cover and amount of material used, and proposed holdbacks to ensure performance of the cover). The WLWB gave Diavik direction to improve future requests.
- Diavik held four engagement sessions on the FCRP during 2022 and invited communities, regulators and EMAB to attend.

Current Concerns [see 2020-21 report for more detail]:

• Revegetation: Diavik's proposal to revegetate about 18% of the site is inadequate. They should revegetate closer to 70% of the site.

- Diavik should follow the recommendations of the University of Alberta revegetation study it commissioned
- Mixing Zones: Diavik should reduce the size of the proposed post-closure mixing zones and monitor them thoroughly.
- North Waste Rock Pile Cover: the performance of the cover is critical to freezing the pile and preventing contaminated runoff. The cover is not completed yet. Successful performance could be affected by global warming, so Diavik will need to monitor it for a long time.
- Wildlife Safety: EMAB has outstanding concerns about steep, rocky areas, safety of water for wildlife, and potential contamination of vegetation.
- Processed Kimberlite Containment Facility (PKC): Diavik has developed a new approach to managing and covering the PKC, where the entire surface slopes towards the spillway. The PKC Closure Design has been delayed and will be submitted with the Final Closure Plan. EMAB looks forward to reviewing the design.
- Contaminated Soil: Diavik wants to bury any soil that doesn't meet environmental guidelines. EMAB wants any contaminated soil that doesn't meet agricultural standards to be shipped offsite.
- Security Estimate: Diavik had a new security estimate approved; however EMAB has concerns about the amount for the waste rock pile, PKC and long-term maintenance and monitoring, including TK monitoring.
- Long-term Monitoring: Monitoring must continue until we are sure there are no potential problems with the closure performance. EMAB expects this will take a very long time.
- Traditional Knowledge (TK): Diavik is required to submit a TK Monitoring plan but has not done so.
 EMAB is concerned that this plan is behind schedule.



HOW EMAB WAS FORMED

The Environmental Monitoring Advisory Board (EMAB or the Board) was created by 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 21st 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.

WHERE WE ARE LOCATED

Our office is in downtown Yellowknife at 5006 Franklin Ave, suite 204 on the 2nd floor of the 50/50 Mini Mall.

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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 make sure the mine, and the regulators, are doing their best to protect the water, animals, fish and air. We also keep communities informed about what is going on at the mine and what EMAB is doing. Board members are appointed by each of their Parties to help protect the environment around the mine.

EMAB goes over Diavik's reports on the effects the mine is having on the environment to make sure we understand any changes the mine has caused. We make recommendations about ways to improve the monitoring. We look at Diavik's plans for protecting the environment, and for closing the mine, and make recommendations on how to make them better. We talk to our community members, tell them what we've learned about the mine's effects, and future plans, and bring their concerns back to the other Board members.

EMAB has been focusing on closure at Diavik in recent years. Diavik plans to keep mining for another three years, then start closing the mine in 2025. Once Diavik stops mining diamonds the Minister may wind down EMAB's activities and the Environmental Agreement. EMAB believes we should continue operating while the mine is being closed and we have asked the Parties to tell us whether they support this approach.

EMAB has been paying close attention to Diavik's closure plans. We are looking forward to reviewing the Final Closure Plan, which is expected by the end of 2022. There are still many parts of the closure planning that EMAB has concerns about. We hear from communities that they want the mine site to be returned as closely as possible to the way it was before the mine started, and we use this approach in all our reviews. We continue to talk with Diavik about involving people from local communities in monitoring the environment after closure, and recommend communities contact Diavik directly about this. The WLWB has required Diavik to include TK Monitoring in the closure plan, but Diavik hasn't submitted a plan yet.

Diavik held one meeting of the TK Panel this year for a TK Fish Camp at Lac de Gras, with a follow-up verification session. They were very careful to avoid exposing elders to COVID-19. EMAB felt this was a sensible approach. The results of the Fish Camp were very troubling as all the Elders refused to eat the fish because of concerns that they were unhealthy. The Elders felt that the mine was likely the cause of the fish condition. EMAB will follow up these results and try to find out what caused the unhealthy condition of the fish.

EMAB had new Board members appointed this year that I would like to welcome and acknowledge: Ryan Miller (YKDFN) was appointed to the Board in March of 2022, replacing Femi Baiyewun, who replaced Sarah Gillis in June. I would like to thank both Sarah and Femi for their hard work on the Board.

EMAB is now three years into our 2019-24 Action Plan. We will review the Action Plan and make any adjustments now that we are halfway through. I expect 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 and recommendations.

The COVID pandemic continued to affect EMAB's operations this year. We took the position that we had a responsibility to make sure we kept everyone safe and didn't contribute to any possible spread of the virus. We put all community updates on hold. All our Board meetings were held by teleconference or as a combination of face-to-face meetings and teleconference. Unfortunately some smaller communities have unreliable access to phone and internet service making video conferencing and conference calls problematic. We limited the number of in-person participants to maintain social distancing and followed all COVID restrictions and guidance. We postponed some Board meetings that were scheduled during periods of high COVID case numbers in Yellowknife.

This will be another busy year coming up for EMAB as the mine gets closer to closing. We will continue to work with Affected Communities to keep you informed and involved in helping to protect the environment at Diavik. Your views and concerns are very important to our work and I encourage anyone with ideas or concerns to talk to your local Board member or contact EMAB.

Marsi Cho Charlie Catholique, Chair



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 2021-22, with more detail on the following pages. Readers can also visit our website: www.emab.ca.

COVID-19:

The COVID-19 pandemic had a significant effect on EMAB's activities in 2021-22. We expect this will change now that COVID-19 restrictions have relaxed. EMAB's goal continues to be doing our best to follow the guidance of the GNWT and Government of Canada, and particularly the NWT Chief Public Health Officer. We have done our best to make sure our staff, our Board members, members of our communities and others we work with were safe and that we were not exposing them to the virus. This affected our operations, and particularly our Board meetings and community updates.

GOVERNANCE:

The Board continues to follow our 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 reviews 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 did not hold any community update meetings this year due to COVID-19. Our Board members from Affected Communities continue in their role of communicating with communities.

OPERATIONS:

EMAB spent \$436,379 in 2021-22 of a budget of \$528,200. The difference will be rolled over to 2022-23.

REVIEWING REPORTS:

In 2021-22 EMAB reviewed 17 reports and plans from Diavik, including documents related to a water licence amendment application; most of them were also reviewed by 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).

One of our main activities this year was to review and make recommendations about Diavik's application to



allow them to break collection pond dams and discharge directly to Lac de Gras.

COMMUNICATIONS:

EMAB regularly updated our website. We circulated our annual report in January, as well as 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 five times in 2021-22: four meetings were a combination of face-to-face and conference call to respect COVID-19 restrictions, and one conference call on a specific issue. Board members were not able to visit the mine due to COVID-19 restrictions.

The Board membership changed during 2021-22. A new Board member was appointed by YKDFN, and the Government of Canada seat remained vacant.

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.

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



Ngeta Kabiri Government of the Northwest Territories



Marc Whitford North Slave Métis Alliance



Jack Kaniak,

Vice Chair

Kitikmeot Inuit Association

ADDRESS regulatory gaps including wildlife

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

ASSESS Diavik's use of TK/IQ in environmental

SUPPORT participation of Aboriginal Peoples in

LISTEN to community concerns and bring them forward

management, air quality and securities.

monitoring program design.

monitoring Diavik.

to Diavik.

Gord Macdonald Diavik Diamond Mines (2012) Inc.



Violet Camsell-Blondin, Secretary Treasurer Tłįchǫ Government



Ryan Miller Yellowknives Dene First Nation

Vacant – Canada (Dinah Elliott resigned in June 2020)

Ryan Miller replaced Femi Baiyewun for YKDFN in March 2022. Femi replaced Sarah Gillis in June 2021.

ENVIRONMENTAL SETTING OF DIAVIK MINE

Lac de Gras (LdG) is a large lake, 60 kilometers in length, with an average width of 16 kilometers and 740 kilometers 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 kilometers 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. The Bathurst caribou population has declined considerably from 186,000 in 2003 to 6,240 in 2021 (most recent GNWT numbers). Since 2016 there has been a noticeable increase in Beverly/Ahiak caribou in the LdG area in the winter and spring. The Beverly herd has also declined from 136,000 in 2011 to 103,000 in 2018 (most recent GNWT numbers). 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 at a glance

Photo cou

- Four ore bodies: A21, A154 South, A154 North, and A418.
- Spending (2000 to 2021): C \$9.3 billion (\$6.7 billion Northern, of which \$3.4 billion with Indigenous firms).
- Operations workforce (2021): 1,232 employees (500 Northerners).
- 2021 rough diamond production: 5.8 million carats.
- Reserves: 5.4 million tonnes at 2.2 carats per tonne (31 December 2021).
- Total rough diamond production: 136.1 million carats (2003 to 2021).

INVOLVING AND SUPPORTING COMMUNITIES



EMAB Board members appointed by Aboriginal Parties are a key link between the board and Affected Communities. They can 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 17 reports and plans in 2021-22. 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, especially in Affected Communities. EMAB also makes these reports available on our website.

EMAB's community involvement last year 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.
- Respect for concerns of community leadership regarding potential exposure.

Due to COVID-19 restrictions and concerns EMAB decided not to hold community updates in 2021-22. We hope that with vaccines and easing restrictions we will be able to hold updates in communities in 2022-23.

Following the finalization of EMAB's Action Plan for 2019-24, EMAB added some actions to provide more information to communities. EMAB now provides a 1-2 page summary of each Board meeting to the leadership of each Aboriginal Party. EMAB has also developed a 2-page annual report summary which is available on our website and provided to community members as a brochure.

COMMUNITY INVOLVEMENT IN POST-CLOSURE MONITORING

EMAB has a mandate to make recommendations about participation of communities/ community members in training and environmental monitoring at Diavik. EMAB has been pursuing information on Diavik's plans to support possible recommendations. EMAB met with Diavik staff in June 2019 about ways for Aboriginal people and communities to be involved in monitoring the environment at the mine during and after closure. We requested that Diavik provide information on qualifications the company will require. At that time Diavik told EMAB they are in the planning phase for post-closure monitoring, and expected this would be complete by end of 2021. EMAB noted that it will be important to have training programs ready to ensure interested people meet qualifications before the start of hiring. Diavik also noted that they could look at contracting for monitoring as an option.

In early 2022 Diavik told EMAB that it plans to work directly with each community on community involvement in monitoring. It said that qualifications vary for each position. Diavik wants communities to contact them if their members are interested in doing post-closure monitoring. Once Diavik finalizes human resources planning for post-closure monitoring they will engage directly with communities with enough time to prepare for employment opportunities, and will provide all required training. EMAB will continue to follow-up with Diavik and report back.

DISPOSAL OF DIAVIK SURPLUS ASSETS

EMAB has been asking Diavik about its plans to dispose of surplus assets after discovering that the company demolished its entire South Camp in 2018 without notifying Affected Communities that these assets might be available.

In early 2022 Diavik informed EMAB that it was doing an appraisal of assets to decide which will be sold and which could be donated. Once this is complete they will do a site tour with Affected Community representatives and businesses, likely later in 2022. Diavik has argued that this issue is not part of EMAB's mandate.



south Camp before demontion



Demolished trailers from the South Camp were disposed of in the Landfill

LETTER OF SUPPORT FOR NORTHERN PARTICIPANT FUNDING PROGRAM

EMAB was pleased with the level of involvement of Indigenous Governments and organizations in the PK to Pits environmental assessment. This high level of involvement was partly due to the establishment of the Northern Participant Funding Program (NPFP) by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and support provided by NPFP to Affected Communities. Following the environmental assessment EMAB recommended that the NPFP be expanded to include regulatory processes such as water licence proceedings. CIRNAC began a review of the NPFP in 2021 and EMAB again expressed our support for the program, and expanding it to include water licencing and permitting processes. We also sent a letter to Parties to the Environmental Agreement notifying them of the NPFP and the process for accessing its funding.

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 in monitoring 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 in monitoring is an EA commitment.

EMAB is pleased to see that Diavik has made efforts to include TK/IQ in closure planning through the 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 responses. 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.

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. EMAB reviews of Diavik's closure planning include assessing how Diavik has incorporated TK Panel recommendations in its closure planning and designs. The WLWB has directed Diavik to describe how each TK Panel Recommendation is incorporated into the final closure plan, and to provide a rationale for each recommendation that was not included.





TK PANEL IN 2021-22

As noted last year, Diavik cancelled TK Panel meetings in 2020 and part of 2021 to prevent potential exposure of TK Panel members to COVID-19. The first Panel session since the start of the pandemic took place in August 2021 at Diavik's Traditional Knowledge Camp on Lac de Gras, and in Yellowknife. The purpose was to do fish palatability and water tasting at Lac de Gras, and to discuss watching/ monitoring of vegetation during closure. Since then, there have been two additional sessions as well as verification meetings on the fish camp report.

<u>TK FISH CAMP</u>

Diavik held a TK Panel meeting at its TK camp in August 2021. This was to test fish palatability and water quality using Traditional Knowledge, as part of the AEMP. An EMAB member who attended the camp told the Board that participants at the camp were concerned about the condition of the fish, as well as the water and the lake bottom. They refused to eat the fish due to their unhealthy appearance and number of parasites and cysts; some participants were willing to taste the water. The report was verified by the Panel in June 2022.



The fish camps are videoed, and the video is edited to produce a final version for the public. Participants found that their statements concerning the condition of the fish were not presented fully in the edited version of the video they saw, and did not agree to approve the video for release. Diavik has agreed to work with the participants to add back missing parts of their video statements.

EMAB made four recommendations to Diavik regarding the TK Fish Camp and Video:

- Report and video should be verified with Panel members as soon as possible.
- Describe the process for choosing locations for setting nets and water sampling.
- Investigate the effects of dust on water and sediment in LdG and report back to EMAB and TK Panel.
- TK Panel decision-making should be as independent as possible; Diavik must not interfere with Panel activities or reporting.

Diavik responded that it would try to finalize the report as soon as possible, and requested that EMAB reconsider the recommendations when the report is complete. Diavik also said that EMAB has no governance authority over the TK Panel.

2021 AEMP REPORT

The 2021 AEMP report included a chapter on the 2021 TK Fish Camp. EMAB recommended that a statement that "Activities at the Traditional Knowledge camp consisted of the fish health and palatability test, water quality and taste test" be changed to acknowledge that the Elders refused to taste the fish or the water. Diavik agreed that fish palatability tests did not take place, and said the statement was an error, but noted that some elders did taste the water at the camp.

EMAB CONCERNS ABOUT INDEPENDENCE OF TK PANEL

EMAB had some concerns about the approval process for the TK Fish Camp Panel report and video, as well as Diavik changing the facilitation of the TK Panel in early 2022. These concerns included: independence of the Panel, the role Diavik has been playing in making decisions that affect the Panel, and the content of Panel reports.

TK Panel members, including an EMAB Board member, were concerned about Diavik's attempts to influence the report and video of the August 2021 TK Fish Camp. They were also concerned that Diavik changed the TK Panel facilitators without consulting or even informing the Panel, after 10 years with the same facilitation. EMAB's view was that the Panel should operate independently of Diavik, and that the Panel should follow the requirements of the Environmental Agreement. EMAB is considering next steps in its relationship with the Panel.

TK PANEL RECOMMENDATIONS REVIEW

EMAB does an ongoing review of Diavik's responses to the Panel recommendations. EMAB has examined all the Panel recommendations up to 2019, and Diavik responses, and assessed whether Diavik accepted each of the recommendations. In general it appears Diavik accepted a little over half of the Panel's recommendations, sometimes with modifications. In some cases, it is unclear whether 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 new TK recommendations from the September 2019 Panel, as well as more recent recommendations from 2021 and 2022. EMAB will report back on the results when complete. EMAB will continue to look at how the Panel's recommendations have been incorporated into future closure plans.

OVERSIGHT AND MONITORING

TK Fish Camp participants heading out to sample water

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 Aquatic Effects Monitoring 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. The 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'èezhìi Renewable Resources Board (WRRB) is a wildlife co-management authority established by the Tłįchǫ Agreement. The WRRB is responsible for managing wildlife and wildlife habitat (forests, plants and protected areas) in the Wek'èezhìı area. It reviews reports submitted under the Water Licence.

TECHNICAL DOCUMENTS EMAB RECEIVED FOR REVIEW IN 2021 - 2022

Report Name	Date Received	Regulatory Instrument
Wildlife Monitoring Report (WMR) (Annual, 2020)	March 31, 2021	Environmental Agreement
Seepage Report (Annual, 2020)	March 31, 2021	Water Licence
Wildlife Management & Monitoring Plan (WMMP)	April 1, 2021	Wildlife Act
2017-19 Aquatic Effects Monitoring Program (AEMP) Re-evaluation Report	May 31, 2021	Water Licence
AEMP Report (Annual, 2020)	June 11, 2021	Water Licence
MVLWB Closure Cost Estimation Guidelines	June 21, 2021	MVRMA
Environmental Agreement Annual Report (Annual 2020)	July 1, 2021	Environmental Agreement
Environmental Air Quality Monitoring Report (EAQMP) (Annual, 2020)	July 13, 2021	Environmental Agreement
WRSA Instrument Location Area 5	July 14, 2021	Water Licence
Processed Kimberlite Management Plan Version 6	July 24, 2021	Water Licence
PKMW Engagement Plan Version 1	September 17, 2021	Water Licence
Water Licence Amendment Application for Progressive Reclamation	October 13, 2021	Water Licence
Security Refund Request – North WRSA and Treatment Chemicals	November 2, 2021	Water Licence
Air Quality Monitoring Guidelines	December 22, 2021	Environmental Agreement
Contingency Plan Version 23	January 20, 2022	Water Licence
Wildlife Management & Monitoring Report (WMMR) (Annual, 2021)	April 1, 2022	Wildlife Act Environmental Agreement
Aquatic Effects Monitoring Program Design Plan Version 6	May 17, 2022	Water Licence
Aquatic Effects Monitoring Program (AEMP) (Annual, 2021)	May 31, 2022	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 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.

AQUATIC EFFECTS Monitoring Program

Diavik's Aquatic Effects Monitoring Plan (AEMP) monitors:

Dust

- Plankton
- Water quality
- Benthic invertebrates
- Eutrophication indicators
- Fish health
- Sediment quality

Diavik submits many different reports for the AEMP. These include Re-evaluation Reports, Design Plans, and Annual Reports. EMAB submits recommendations on Diavik's AEMP reports. Below is a summary of the highlights for this year. The full review documents, and list of EMAB recommendations can be found on our website.

THE ENVIRONMENTAL AGREEMENT AND THE WATER LICENCE

The water licence and the Environmental Agreement both contain requirements for the AEMP. Most of the water licence requirements are more detailed than those in the Environmental Agreement. The WLWB cannot make Diavik meet any of the Environmental Agreement commitments unless they are also in the water licence. In the Environmental Agreement 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.





2017-2019 AEMP RE-EVALUATION

EMAB reported on the 2017-19 AEMP Re-evaluation Report (RER) in the 2020/2021 EMAB Annual Report. At the time of writing last year's report the WLWB had not made a decision on the RER. The WLWB approved the RER on January 31, 2022 on condition that Diavik make specific revisions, and submit an Addendum within three months, addressing nine outstanding issues.

Below is a summary of the decisions made by the WLWB on Diavik's 2017-2019 AEMP Re-evaluation Report. For a full copy of our review and recommendations visit: www.emab.ca.

DUST:

EMAB RECOMMENDATION: Diavik should include an assessment of all parameters identified as Substances of Interest (SOI's) in dust assessments.

WLWB DECISION: Diavik must provide a rationale for:

• Why particular parameters are included in detailed analyses for snow chemistry surveys and

 Why all parameters identified as SOIs for water and sediment quality are not included in the detailed analyses.

SEDIMENT:

EMAB RECOMMENDATION: Diavik should analyze the results of the sediment quality monitoring program before and after the sampling method changed.

WLWB DECISION: Diavik must address the Board's direction from the 2014-2016 Re-evaluation Report related to the change in sediment sampling methods. Diavik must explicitly address the implications of the sediment methodology changes and ways to overcome them.

PLANKTON:

EMAB RECOMMENDATION: Diavik should compare phytoplankton counts for 2019 to previous years.

WLWB DECISION: In future re-evaluation reports, Diavik must include an analysis of whether differences between taxonomists are limiting the assessment of phytoplankton effects over time, and whether an adjustment to the normal ranges is necessary.

FISH HEALTH:

EMAB RECOMMENDATION: Diavik should use the same approach to data analysis for all years of monitoring, and compare all data to the normal ranges. Diavik should present critical effects sizes (CES's), which describe the magnitude of effects on fish, for each year of monitoring.

WLWB DECISION: Diavik to address data analysis in the updated Fish Response Plan, required in follow-up to the 2019 AEMP report.



EMAB RECOMMENDATION: Diavik should include effluent temperature data and an assessment of possible effects of effluent discharge on water temperature in Lac de Gras.

WLWB DECISION: Effluent temperature is unlikely to affect water temperature in Lac de Gras so EMAB's comment has been addressed.

<u>SLIMY SCULPIN – METALS:</u>

EMAB RECOMMENDATION: Diavik should revisit the normal ranges and modify as required to adequately represent reference conditions.

WLWB DECISION:

Diavik to submit version 2 of the Reference Conditions Report by end of May 2022 including:

- Diavik must revise the standard normal range for boron to the 2013 detection limit.
- Diavik must assess whether the 2007 lead data should be excluded from the calculation of the



normal range for lead, and provide a rationale if they determine the 2007 data should remain.

MERCURY IN SLIMY SCULPIN

EMAB RECOMMENDATIONS:

- Present mercury vs. length and weight analysis, and a detailed description of methods.
- Diavik should add a description in their 2017-2019 Re-evaluation Report of how data were analysed based on composite samples.
 - Diavik noted that composite fish samples used fish of similar size, length and weight.
- Analyse mercury in individual Sculpin rather than as composite samples of multiple fish in future monitoring.
 - Diavik noted that composite samples were analyzed instead of individual samples to meet minimum sample volume requirements and detection limits outlined in the QAPP.



Snow sampling at the site

WLWB DECISION: The WLWB found that Diavik adequately addressed the recommendation on analysis of mercury vs. length and weight.

WLWB DECISION: Diavik must revisit the significance of fish size as a predictor of mercury and selenium concentrations in Slimy Sculpin in the revised Reference Conditions Report.

MERCURY IN LAKE TROUT:

EMAB RECOMMENDATION: Diavik should conduct the lake trout tissue analyses with and without the 2014 dataset to look at the differences.

WLWB DECISION: The WLWB agreed with Diavik that it is unlikely that the removal of the 2014 data would impact the assessment of trends or the conclusions in the 2017-2019 Re-evaluation report.

2017-19 AEMP RE-EVALUATION Report Addendum

As part of the approval of the 2017-19 AEMP Reevaluation, the WLWB required that Diavik submit an addendum addressing nine outstanding issues. The WLWB circulated Diavik's 2017-19 AEMP Re-evaluation Addendum on May 6, 2022. EMAB had our technical consultants at North-South Consultants review it. We submitted 10 comments and recommendations to the WLWB; a number of these repeated comments we made on the 2017-19 RER that were not adequately addressed. Comments and recommendations were also submitted by GNWT-ENR and DFO.

Below is a summary of our review, with key recommendations. For a full copy of the review and our recommendations, visit our website: www.emab.ca.

DUST DEPOSITION

Diavik did not provide analysis for all metals found in the snow surveys.

EMAB RECOMMENDATION: Diavik should include detailed analysis for other metals – particularly those that were elevated in the water and/or sediment OR provide a clear rationale for not including other parameters.

SEDIMENT QUALITY

Methods for sediment quality sampling have changed, possibly affecting interpretation of trends.

EMAB RECOMMENDATION: Diavik should analyse sediment sampling results separately before and after the sampling method changed.

EUTROPHICATION - CUMULATIVE EFFECTS

The report looks at cumulative effects of nutrients from Diavik and Ekati, such as nitrogen and phosphorus, but does not look at the effects on algae.

EMAB RECOMMENDATION: Diavik should include algae in the cumulative effects assessment.

<u>SLIMY SCULPIN METALS — DATA ANALYSIS</u>

EMAB has noted apparent issues with the 2007 slimy sculpin metals data that affects comparability of results to later years, possibly affecting the "normal ranges." Diavik recommended leaving out the 2007 data, and re-analyzed some of the metals that might have been affected. EMAB agreed that the 2007 slimy sculpin metals data should not be used in future analyses.

EMAB RECOMMENDATION: Diavik should review and recalculate the normal ranges for all slimy sculpin metals data. Using the recalculated normal ranges, redo the comparisons to normal ranges.

EMAB RECOMMENDATION: Diavik should re-analyse trends without the 2007 data for additional metals including: antimony; barium; beryllium; bismuth; boron; chromium; cobalt; iron; lead; mercury; selenium; silver; tellurium; and vanadium. Re-analysis should be conducted for any other metal that ALS Laboratories identified as biased high (the Addendum did not identify these parameters).

EMAB RECOMMENDATION: Diavik should provide a table identifying analytical laboratories, methods, and detection limits for metals in Slimy Sculpin by year.

MERCURY IN LAKE TROUT — STATISTICAL MODELLING

While Diavik followed the WLWB direction, EMAB notes that North-South has identified issues with the Lake Trout mercury dataset that have not been addressed. These could affect the analyses of changes in Lake Trout mercury.

<u>MERCURY IN LAKE TROUT — CONSUMPTION</u> Guidelines

EMAB still believes that the Health Canada Risk Assessment approach based on the amount of fish consumed, may be more appropriate for looking at effects on human health.

<u>MERCURY IN LAKE TROUT — DESCRIPTION OF</u> <u>Triggers for Monitoring Program</u>

Diavik's response does not adequately describe how a Lake Trout mercury survey would be triggered.

EMAB RECOMMENDATION: Diavik should provide a clear, detailed description of when a mercury in Lake Trout survey would be undertaken (as opposed to a Lake Trout health study).

NORTH-SOUTH MERCURY Investigation

EMAB had North-South Consultants Inc. (NSC) review Diavik's lake trout tissue data and identify potential issues (see 2019/2020 annual report). This was the first part of an ongoing multi-part study.

NSC found that baseline mercury data collected before mining operations are not comparable to other data Diavik has collected. This is because different data collection methods were used at different times in multiple laboratories. Different analytical methods were used as well. This made it more difficult to compare earlier data to later data. NSC also found that some of the data was not suitable for a detailed analysis, particularly from 2014.

In the second part of this study, NSC suggested additional analysis, including:

- Re-analysing the data using a different statistical method. This would involve statistical modelling to allow analysis of trends over time,
- Re-analysing mercury results from 2008, 2011, and 2014 to improve the data quality,
- Re-analysis of data including the most recent data from 2018, and
- Analysing data from other years, possibly combining all data from 2002-2004 as one dataset.

NSC had several recommendations as a result of their investigation:

- Collect both fillets and plugs from some trout to compare moisture content to assure data quality, and analyse the fillets using the same lab and method to allow for direct comparison,
- Include lab reports with all submissions, and
- Build a database of all fish mercury data collected, including relevant metadata (i.e. length, weight).

EMAB submitted many of NSC's recommendations as part of our review of Diavik's 2017-19 AEMP Re-evaluation Report (see description of 2017-19 Re-evaluation for WLWB decisions on EMAB comments).

2020 AEMP REPORT

EMAB reported on the 2020 Aquatic Effects Monitoring Program (AEMP) in the 2020/2021 EMAB Annual Report. At the time of writing last year's report the WLWB had not made a decision on the report. The WLWB approved the report on January 31, 2022.

Below is a summary of decisions from the WLWB. For a full copy of the review and our recommendations, visit our website: www.emab.ca.

<u>DUST</u>

EMAB RECOMMENDATION: Diavik should include an assessment of all Substances of Interest (SOI) in the dust assessments.

WLWB DECISION: Diavik is required to provide this information in an addendum to the 2017-19 Aquatic Effects Re-evaluation Report (see pages 22-25). WLWB will consider recommendations on this issue as part of its consideration of the 2017-2019 Aquatic Effects Reevaluation Report Addendum.

EFFLUENT AND WATER QUALITY

EFFLUENT TEMPERATURE

EMAB RECOMMENDATION: Diavik should include temperature data for effluent and mixing zone stations, and assess the effects that effluent discharge has on water temperature near the mine.

WLWB DECISION: In future AEMPs, Diavik must include temperature data for the SNP stations associated with the AEMP.

AMMONIA

EMAB RECOMMENDATION: Diavik should analyze ammonia in preserved and unpreserved water samples at both laboratories to help confirm the usefulness of the 2020 dataset.

WLWB DECISION: Diavik must analyze ammonia in unpreserved samples at both laboratories concurrently and include the results of the investigation in the 2022 AEMP Annual Report.

PLANKTON AND EUTROPHICATION INDICATORS

EMAB RECOMMENDATIONS/WLWB DECISIONS:

Diavik Should:

- Recalculate normal ranges for all phytoplankton metrics.
 - > Diavik committed to conduct an analysis on the normal ranges in future years.
- Describe how comparisons between years will be done given the issues between each dataset.
 - The WLWB has required that Diavik analyze whether differences between laboratories are limiting the assessment of phytoplankton effects over time in the upcoming 2020-2022 Aquatic Effects Re-evaluation Report.
- Consider modifying the study design to account for changes in laboratories over time.
 - Diavik responded that modifications to the study design were not recommended. They said they routinely consider options for improvements and modifications to the study design throughout the re-evaluation and re-design process. WLWB directed Diavik to investigate this.
- Ensure future laboratories use the same methods.
 - Diavik has provided the new laboratory with previous methods used and requested they do

not change them at all. The WLWB stated that Diavik has addressed the recommendation.

- Compare laboratory results through examination of more samples.
 - Diavik stated that further analysis would require additional information and committed to address it in the 2020-22 report. The WLWB accepted Diavik's commitment.

AEMP DESIGN PLAN VERSION 6

The AEMP Design Plan describes how Diavik will carry out water, sediment, and biological monitoring in Lac de Gras, and how it will respond to changes detected by the monitoring. Diavik is required to review and update the AEMP Design Plan every three years following the threeyear summary report. This allows Diavik to make changes to the program based on findings to date.

The WLWB circulated the AEMP Design Plan Version 6 on May 17,2022. EMAB had North-South Consultants review the updated plan. EMAB submitted 21 comments and recommendations. GNWT-ENR and DFO also submitted comments. The WLWB had not made a decision on the version 6 of the Design Plan at the time this annual report was written.

Here are some of the highlights of EMAB's review:

LAKE TROUT MERCURY

EMAB has been concerned about monitoring of mercury in Lake Trout in Lac de Gras for many years, and we were disappointed when regular monitoring of this was taken out of the AEMP.

SAMPLING FOR TRADITIONAL KNOWLEDGE STUDY

Diavik continues to collect data on mercury in Lake Trout through the Traditional Knowledge Fish Tasting study, done every three years near the mine. Diavik proposed to change the trout sampling in Design Plan 6 by analyzing 10 trout of the same sex and size class. EMAB recommended the sampling of trout continue as it has in the past.

EMAB RECOMMENDATION: Diavik should continue analysing mercury from a range of sizes of Lake Trout to be consistent with past programs and to allow for examination of mercury as it relates to the size of fish.

TRIGGER FOR MONITORING

Diavik stated that the mercury results from the TK Study of Lake Trout can't be used to trigger a Lake Trout mercury study under the AEMP because the methods are inconsistent. EMAB's view is that it should be possible for the TK Study results to trigger a Lake Trout Mercury Study.

EMAB RECOMMENDATION: Diavik should review results from the palatability study and develop an early warning trigger for a larger Lake Trout mercury program.

EMAB RECOMMENDATION: Diavik should analyse temporal trends for other metals measured in Lake Trout as part of the palatability studies, considering reported increases for some metals in Slimy Sculpin.

CUMULATIVE EFFECTS ASSESSMENT VARIABLES

EMAB has stated that algae should be included in the assessment of cumulative effects of Diavik and Ekati on Lac de Gras, since it may be affected at the outflow of Lac de Gras where discharge from Ekati mixes with water affected by Diavik.

EMAB RECOMMENDATION: Diavik should include algae (chlorophyll *a*) in the cumulative effects assessment.

METAL AND DIAMOND MINING EFFLUENT REGULATIONS (MDMER) — EXPECTATIONS OF EQUIVALENCY

MDMER, which applies to Diavik, requires monitoring of two fish species, measurements of fish eggs and

chronic toxicity testing on a plant species. The AEMP only monitors one fish species and does not monitor the other two requirements.

EMAB RECOMMENDATION: Diavik should clarify if the intent of the AEMP is to incorporate all requirements of the MDMER and if so, either add an additional fish species and measurement of egg counts and fecundity to the fish monitoring program and chronic toxicity testing of effluent using *Lemna minor* or indicate why these components will be excluded.

2021 AEMP REPORT

The WLWB circulated Diavik's 2021 AEMP Annual Report on May 31, 2022. EMAB had our technical consultants at North-South Consultants review the 2021 AEMP. We submitted 23 comments and recommendations to the WLWB. Comments and recommendations were also submitted by GNWT-ENR. The WLWB had not issued its decision at time of writing.

Below is a summary of our review, with key recommendations. For a full copy of the review and our recommendations, visit our website: <u>www.emab.ca</u>.

TRADITIONAL KNOWLEDGE STUDY REPORT

Diavik's Traditional Knowledge (TK) Fish Camp includes fish health and palatability testing, water quality and taste testing, excursions on the land, recording a video documentary, interviews, and cultural practices and ceremonies. During the 2021 Fish Camp all the elders and other participants refused to taste the fish because they determined they were unhealthy. They also refused to taste the water (see TK/IQ section of the annual report for more detail). They suggested dust might have caused the changes in LdG. EMAB is very concerned about the Elders' observations and will follow up.

The 2021 AEMP report stated that fish palatability testing and water taste tests took place. It also noted that the



Fish sampling at TK Fish Camp (

report from the camp was not available, and said that it would be provided as an appendix to the 2022 AEMP Annual Report. This would mean the results of the 2021 TK Fish camp would not be made available until March 2023, after the 2022 AEMP monitoring program is completed. The 2022 AEMP is a comprehensive sampling year and will include sampling of fish, metals in fish tissue, sediment quality, and benthic invertebrates.

EMAB RECOMMENDATION: Diavik should provide the results and discussion of the 2021 TK program with sufficient time to allow review of the report prior to undertaking the open water season AEMP monitoring.

EMAB RECOMMENDATION: Diavik should revise pages iv, 58 and 60 of the report to acknowledge that the Elders refused to taste the fish or the water during the 2021 Traditional Knowledge Camp due to concerns about the health of the fish and the water.

PLANKTON AND PHYTOPLANKTON

Plankton are tiny plants and animals suspended in the water that fish eat. Diavik monitors plankton to see if the mine is impacting it. There was a total of 44 plankton samples taken at 5 stations around Lac de Gras in 2021.



Diavik did not collect duplicate phytoplankton samples required by the AEMP in 2021. It is important for these quality assurance/quality control measures to be taken.

EMAB RECOMMENDATION: Diavik should include field duplicate samples in future monitoring programs.

Diavik reports on two phytoplankton measures – Chlorophyll *a* (algae), and phytoplankton biomass. The report noted that Chlorophyll *a* concentrations were above the normal range (expected range) throughout the entire lake, while phytoplankton biomass was almost all within the normal range (excepting one measurement). **Up until 2021 the greatest extent of effect of Diavik on chlorophyll** *a* **in Lac de Gras was 44%, so this is a very large increase. EMAB will continue to keep a close eye on these indicators.**

EMAB RECOMMENDATION: Diavik should discuss possible data quality issues for phytoplankton biomass data (as was done for chlorophyll *a*).

EMAB RECOMMENDATION: Diavik should conduct a correlation analysis between chlorophyll *a* and phytoplankton biomass results.

SPILL REPORT FOR DIAVIK DIAMOND MINE 2021 - 2022 (GNWT DATABASE)

Spill No.	Date	Commodity	Quantity (L)	Source
2021197	May 20, 2021	Other	Unknown	Overflow event
2021340	July 22, 2021	Petroleum lubricating oil	100	Breakage
2021332	August 5, 2021	Wastewater (sewage, mine tailings)	75	Other
2021347	August 14, 2021	Petroleum lubricating oil	1500	Breakage
2021346	August 14, 2021	Petroleum lubricating oil	1000	Breakage
2021359	August 17, 2021	Other	267,000	Pipe leaks
2021468	November 7, 2021	Other	83,000	Other
2021486	December 4, 2021	Wastewater (sewage, mine tailings)	300	Other
2022004	January 4, 2022	Petroleum fuel oil	300	Overflow event
2022025	February 5, 2022	Other	2500	Pipe leaks
2022033	February 12, 2022	Petroleum lubrication oil	980	Breakage
2020264	March 3, 2022	Petroleum lubrication oil	1000	Breakage
2022004	March 8, 2022	Petroleum fuel oil	300	Overflow Event

UNDERGROUND SPILLS:

The number of underground spills in 2021 was lower than in 2020, but the amount spilled was higher, and is roughly average for the last five years. 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		2020		2021			
Liters spilled	# of spills	Liters spilled	# of spills	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	1256L	62 spills	1617L	59

WATER LICENCE AMENDMENT: PROGRESSIVE RECLAMATION

Diavik applied to amend their Water Licence in October 2021 to allow :

- Taking water from Lac de Gras to fill the pits.
- Reconnecting collection ponds with Lac de Gras.

EMAB's only concern with filling the pits was to make sure it was done in a controlled manner so the lake level didn't drop below normal levels during filling.

EMAB was very concerned with the proposal to breach the collection pond dams and allow the runoff to flow freely into Lac de Gras. The Diavik mine is circled by collection ponds that capture any runoff from the mine. The runoff is pumped to the North Inlet and treated in the water treatment plant before being discharged to Lac de Gras. Diavik's proposal would allow the mine to breach the dams while the mine is still operating, and allow any runoff to flow directly into Lac de Gras.

Diavik called the application an administrative change, so did not provide any detailed information on how they would breach the dams, or how the discharge would affect water, fish or other aquatic life. EMAB viewed the application as incomplete, and wanted detailed information before we could agree to this approach:

- Previous modelling predicted that the runoff from the collection ponds could be harmful to Lac de Gras, especially during spring melt and heavy rains (see comments on runoff and seepage water quality and mixing zones - p. 34-35 of EMAB 2020-21 Annual Report).
 - WLWB directed Diavik to do specific modelling of mixing zones for each collection pond, but Diavik has not yet done this.



- Diavik must show that any discharge will meet AEMP benchmarks and not be harmful to aquatic life.
- Before discharge, Diavik must provide predicted size of the mixing zone; quality of water and sediment; condition of fish and benthic invertebrates.
- Provide a detailed monitoring plan to assess effects of the discharge.
- Diavik should explain how it will stop discharge if harmful levels of contaminants are detected.

EMAB felt the application did not provide information on potential environmental effects and should have been sent back for revision.

EMAB has participated in the entire review process, from the initial review of the application, to attending the technical workshop, intervening at the Water Licence hearings and commenting on the draft licence. EMAB also asked North-South Consultants to design a monitoring program for the areas where Diavik was proposing to discharge. A full version of all EMAB's submissions can be found on our website: <u>www.emab.ca</u>.



Participants in the technical session included: EMAB, DKFN, ECCC, DFO, FRMG, GNWT-ENR, GNWT-Lands, LKDFN, NSMA, TG, and NWT Metis Nation. During the technical session Diavik was directed to provide a detailed plan that would describe the research and monitoring requirements for the ponds, to be included in the Water Licence. Diavik would submit a separate plan for review for each collection pond.

SUMMARY OF EMAB INTERVENTION AND RECOMMENDATIONS TO WATER LICENCE HEARING

The WLWB held a Public Hearing on February 22-23, 2022 for Diavik's Water Licence Amendment. There were four Parties that Intervened:

- Tłįcho Government,
- Deninu Kue First Nation,
- Government of the Northwest Territories, and
- Environmental Monitoring Advisory Board.



EMAB made many recommendations regarding the proposal to breach collection ponds. The main areas we focused on were:

DECOMMISSIONING CRITERIA AND UNCONTROLLED DISCHARGE INTO LAC DE GRAS

Diavik proposed the Metal and Diamond Mine Effluent Regulations as Effluent Quality Criteria (EQC) for the discharge from the ponds. EMAB's view was these were not strict enough to protect aquatic health. **SUMMARY OF EMAB RECOMMENDATIONS:** Regulate discharges through site-specific EQC for each mixing zone. Sample discharge frequently to show compliance with water quality criteria. Control release of discharge from ponds rather than breaching ponds.

WLWB DECISION: WLWB noted that Diavik had not submitted any evidence on predicted water chemistry at the discharge points, leaving them unable to set EQC's. They included a requirement for Diavik to discuss the potential for controlled discharge, but did not require it.

LACK OF A MIXING ZONE RESEARCH PROGRAM OR Monitoring Plan

Diavik did not propose any research or monitoring plans in the amendment. They planned to submit these after the amendment was approved. EMAB wanted Diavik to provide information on the collection ponds, modelled discharge and mixing zones, and monitoring, in order to assess Diavik's application.

SUMMARY OF EMAB RECOMMENDATIONS: There

is a need for sampling of each collection pond before it is breached, and within the modelled mixing zones. The sampling design should take into account that flow from some of the ponds will only happen during snowmelt and after rain. The sampling should define the size and location of the mixing zone, and the effects of the discharge on water quality, sediment quality, fish and benthic invertebrates.

EMAB also made detailed comments on the required content of the Decommissioning Plans for each pond.

WLWB DECISION: The WLWB included all the sampling components suggested by EMAB in the Decommissioning Plan description, but said that these would be included "if applicable."

DEVELOPMENT OF WATER QUALITY CRITERIA

Water quality criteria must be developed that will protect the health of aquatic organisms, as described in the site wide closure criteria SW2. The EQC proposed by Diavik would not be protective of aquatic life.

SUMMARY OF EMAB RECOMMENDATIONS: Diavik should propose water quality criteria that ensure that AEMP benchmarks are met.

WLWB DECISION: The WLWB decided there was not enough evidence to set EQC that were protective of the aquatic environment, so included a requirement for Diavik to propose water quality criteria for each pond in the Decommissioning Plans.

NEED FOR RAPID RESPONSE

SUMMARY OF EMAB RECOMMENDATIONS: The monitoring program must be designed so Diavik can respond quickly if water quality stops meeting criteria.

DRAFT WATER LICENCE

In March 2022, the WLWB distributed a Draft Water Licence for comment. EMAB did a detailed review and made 19 recommendations related to implementing our intervention recommendations. DFO, ECCC, DKFN, GNWT-ENR, and GNWT-Lands all made comments. TG submitted comments after the deadline.

EMAB submitted its closing arguments to the WLWB in April 2022. These reflected our key Intervention recommendations. DKFN, GNWT and TG also submitted closing arguments.

WLWB sent its recommendations for the new water licence to the Minister on June 2, 2022. The Minister did not approve the licence because:

• There was no information on predicted environmental impacts, as required by the *Waters Act*.

- Discharge criteria could be changed at any time, since they are in a Schedule to the licence.
- The *Waters Act* requires EQC in the licence at least as strict as MDMER.

The WLWB did not agree with the Minister and stated that the recommended licence meets the requirements of the *MVRMA* and *Waters Act*. The WLWB requires the additional technical evidence that will determine if EQC are required. They suggest there needs to be an agreed interpretation of subsection 27(5) of the *Waters Act* to resolve this conflict about EQC, and avoid future conflicts.

The Tł₁ch₀ Government sent a letter to the WLWB expressing concern about the Minister's decision being beyond his authority, intruding on the jurisdiction of the WLWB, and undermining the intent of the Tł₁ch₀ Agreement.

In August 2022 the Minister requested the WLWB make a ruling to re-open the proceedings to allow Diavik to provide more evidence on the water quality discharge from the collection ponds and the potential effects on the waters around East Island. The WLWB had not made a decision at time of writing.

Complete versions of EMAB's Intervention, presentation to the WLWB public hearing, and comments on the draft Water Licence are on EMAB's website: <u>www.emab.ca</u>.

PK TO PITS ENGAGEMENT PLAN

The PK to Pits Engagement Plan is required by the water licence to ensure potentially affected Indigenous groups have a way to provide feedback to Diavik on the PKMW project, its impacts and ways to reduce those impacts. The plan also addresses engagement requirements set by the MVEIRB in its environmental assessment of the project. The intent is to make sure water is safe for people, aquatic life, and wildlife, and is acceptable for cultural uses such as harvesting.



WLWB circulated Diavik's PKMW Engagement Plan on October 1, 2021.

Diavik had finalized engagement protocols with:

- Lutselk'e Dene First Nation,
- North Slave Metis Alliance,
- Kitikmeot Inuit Association,
- Tłįchǫ Government,
- Deninu Kue First Nation, and
- Northwest Territories Metis Nation.

Diavik noted that it was working on engagement protocols with the Yellowknives Dene First Nation (YKDFN)and the Fort Resolution Metis Government (FRMG), and expected to finalize them soon.

EMAB submitted 8 comments and recommendations on the PK to Pits Engagement Plan. Tł_icho Government and Yellowknives Dene First Nation also submitted comments. A copy of Diavik's engagement plan can be found on the WLWB public registry.


EMAB made recommendations about how often engagement should take place, who should be involved, how long organizations should have to review documents and how TK would be provided.

The WLWB approved the PKMW Engagement Plan on November 19, 2021 with the requirement that Diavik submit version 1.1 of the plan addressing the comments, and after they finalized engagement plans with YKDFN and FRMG. WLWB also sent an Information Request to FRMG requesting they provide a timeline for development of a protocol, and any challenges.

Diavik submitted PKMW Engagement Plan version 1.1 on February 18, 2022. While it had finalized an engagement protocol with YKDFN, it had been unable to finalize one with FRMG in spite of a dozen engagement events. The WLWB decided that Diavik had demonstrated efforts to finalize all engagement protocols and approved version 1.1 of the plan on March 30, 2022, while encouraging Diavik and FRMG to continue to develop an engagement protocol. One of the reasons for the WLWB's approval, was that it was needed to allow Diavik to submit cultural use criteria for the PKMW project.



For a full list of EMAB comments and recommendations on Diavik's PK to Pits Engagement Plan visit our website: <u>www.emab.ca</u>.

PKC MANAGEMENT PLAN Version 6

In July 2021, Diavik submitted its Processed Kimberlite Management Plan (PKMP) Version 6 to the WLWB as well as the PKCF Phase 7 Dam Raise and Phase 7 spillway design.

Diavik proposed to build a 4-6 m. high, lined berm on top of the existing PK, inside the current PKC dam. This berm would extend around the outside of most of the PKCF. It would be constructed of coarse processed kimberlite (CPK). In the north-west corner Diavik proposed to build a sump and new spillway that leads to collection pond 3. Any new fine PK that discharges from pipes to the PKCF would flow towards the spillway. The previous design included a central pond with the PK all sloping towards the center. In the new design the PK slopes from the SE



Schematic Representation of FPK and CPK Raised Above the Elevation of the Existing PKC Dam and Liner

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. For many years there was a pond located near the center of the PKC that changed 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 area that is like quicksand. It is also called slimes. Any person or animal walking on it would sink in. towards the sump and spillway in the NW of the PKC, with no central pond. This is a big change and will likely have a major effect on the closure plan for the PKC.

EMAB had Slater Environmental (SEC) do a technical review of PKMP Version 6, which guided the 15 recommendations EMAB submitted. Comments and recommendations were also submitted by Tłjcho Government, GNWT-ENR and ECCC. The WLWB approved the updated PKCF Phase 7 Dam and Spillway Design and Processed Kimberlite Management Plan Version 6 on September 30, 2021 with a number of directives. The Board approved Version 6.1 of the PKMP on December 21, 2021 with all directives fulfilled. For a full list of EMAB recommendations, and to see the whole PKC Management Plan review, visit our website: www.emab.ca.

Here is a summary of our review and key recommendations:

The PKMP Version 6 could have some advantages for closure by making it easier to put a cover on the PKC and allowing any water to run off. However, detailed monitoring of the PKCF will be needed, along with plans for long-term maintenance. The long-term performance



of the landscape, especially maintaining slopes that direct water to the spillway, has a lot of uncertainty.

EMAB RECOMMENDATION: Diavik should be required to show it has a feasible closure plan for the proposed PKCF, and how the PKMP changes the overall closure plan for the site.

WLWB DECISION: A PKC closure plan is not required at this time. Diavik must include a discussion in the PKCF Closure Plan on whether moving extra fine PK from the PKCF to the mine workings is feasible.

EMAB stated concerns on whether the long-term landscape will maintain a slope that would allow water to move across the PKCF and out the spillway. We also stated our concerns about issues related to consolidation and settlement of the fine PK.

EMAB RECOMMENDATION: Diavik's PKMP V6 and updated design should include monitoring of settling and consolidation of fine PK across the PKCF. Modelling should inform long-term settling characteristics.

WLWB DECISION: Diavik must consider settling and consolidation of the PKCF in the PKCF Closure Plan.



EMAB noted that Diavik's Geotechnical Review Board made recommendations about the need for detailed engineering of the berm and careful quality control to make sure the berm was stable. We were also concerned about building the berm directly on PK.

EMAB RECOMMENDATION: Diavik should describe specifically how it has addressed each of the suggestions from the Geotechnical Review Board about construction of the CPK embankment on FPK foundations. In addition, DDMI should provide details about construction quality assurance/quality control for the CPK embankment, including what construction monitoring, triggers and response plans will be applied in areas where material will be placed on FPK beaches.

WLWB DECISION: Since stability of the berms could change over time and become a concern, the Board requires DDMI to notify the Board and the Inspector as soon as possible if any of the triggers in its Trigger Action Response Plan (TARP) for CPK placement are activated, describe the trigger, identify what actions will be taken and state when they will be implemented.

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Meromixis is a condition in a lake where the water does not fully mix. 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 mix slowly, over decades. It is because of this meromixis that Diavik is confident that PK will remain at the bottom of the pit lakes, and not mix with the surface water. **Courtesy of Diavik Diamond**

CONTINGENCY PLAN VERSION 23

Diavik submitted their updated Contingency Plan Version 23 on January 24, 2022. This was required by the water licence for the PK to Pits project.

EMAB submitted three comments and recommendations to the WLWB on February 21, 2022. GNWT-ENR and the Inspector also submitted comments. The WLWB approved the plan on April 19, 2022 with direction for Diavik to submit version 1.1 with some changes.

EMAB's concerns about contingency planning for the PK to Pits project included:

• How will Diavik close the pit lake dike breaches if

there is poor water quality in the pit lake,

- Providing information on the possible impacts related to the contingency plans, and how the plan will include the views of affected communities, and
- Describing the impact on Lac de Gras of loadings related to unpredicted mixing of the pit lakes.

WLWB DECISIONS

WLWB DECISION: In the Final CRP, Diavik must include details about the contingency measures for unacceptable water quality in the pit lakes.

WLWB DECISION: The WLWB decided that Diavik should expand on the possible impacts related to the contingency plans, and how it has incorporated views of affected communities as part of the Final CRP.

CLOSURE AND RECLAMATION

Diamond mining disturbs the land and creates 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's water licence requires that a Final Closure and Reclamation Plan must be approved by 2022.

Diavik works with a TK Panel to seek Traditional Knowledge input on closure plans. The Panel's recommendations can be found on EMAB's website: <u>www.emab.ca</u>.

EMAB was involved in a number of closure-related activities this year:

- Tracking development of Diavik's Traditional Knowledge Monitoring Plan for closure.
- Reviewing new guidelines for closure cost estimates.
- Reviewing Diavik's request to adjust security estimates following the WLWB decision on ICRP 4.1.
- Reviewing Diavik's request for a security refund for Treatment Chemicals and for the NWRSA cover.
- Reviewing proposed instrumentation cluster location.

EMAB had also anticipated reviewing designs for PKC Closure, Revegetation and the South Country Rock Pile which Diavik had committed to providing in the 2020 Annual CRP Progress Report. Diavik pushed back the submission timing to the 2021 Annual CRP Progress Report. Most recently Diavik has said they will provide



CLOSURE AND MONITORING TIMELINE 2022-2037

Diavik Mine Site 2021

North Waste Rock Storage Area

Processed Kimberlite Containment Facility

South Waste Rock Storage Area



these designs in final form in the Final Closure and Reclamation Plan (FCRP), expected in late 2022. These ongoing changes have made it difficult for EMAB to plan. Delayed submission of all these critical designs to the Final Closure Plan will make the review of the FCRP an even larger and more complicated task.

PROGRESS ON TK MONITORING PLAN

As a part of closure planning, Diavik is required to develop a TK Monitoring Plan for closure, in consultation with the TK Panel and Affected Communities. The WLWB directed Diavik to develop a Traditional Knowledge Research Plan in 2009. Progress has been slow, Diavik's approach has changed, and there is still no TK Monitoring Plan. In its June 2021 decision on ICRP 4.1 WLWB again directed Diavik to propose a TK Monitoring Plan in the Final Closure and Reclamation Plan, and to show recommendations from communities about the Plan, and how Diavik included them.

Diavik provides an update on TK Monitoring at each EMAB meeting. The company has convened several TK Panel meetings on post-closure monitoring. In addition Diavik has been working with the Tł_jchǫ Government Indigenous communities and organizations to get feedback on the proposed approach. EMAB has asked Aboriginal Parties about their views on holding a joint meeting of all the Parties on the draft TK Monitoring Plan once it is ready.
However at an EMAB meeting in August 2022 Diavik informed EMAB that it was again changing its approach to development of the TK Monitoring Plan. Rather than engaging with communities and the TK Panel, Diavik has requested Expressions of Interest from Affected Communities, Indigenous Development Corporations

to find out how their experience with their "Boots on

the Ground"TK monitoring program for caribou could

help Diavik in developing a TK Monitoring Plan. Diavik

had proposed to use a similar approach to monitor

the post-closure landscape at Diavik. Diavik had also

proposed cultural water use criteria for monitoring water at the mine site. Diavik proposed that the TK Monitoring

Program would take place once every 2-3 years. It would

run for 7-10 days and involve 10-15 TK monitors. Diavik

had hoped to do a trial run of water monitoring in 2022

7-10 days of TK Monitoring every 2-3 years was enough.

with Tłı, cho, citizens, but that has been postponed to 2023. EMAB expressed concern to Diavik about whether

Diavik said it also planned to engage with other

associated with Affected Communities, and other Indigenous Governments. EMAB is concerned that this approach does not include consideration of the work of the TK Panel, and does not require all Aboriginal Parties to participate in development of the Plan, or to participate in the monitoring. EMAB will continue to monitor the development of Diavik's TK Monitoring Plan for Closure.

CLOSURE COST GUIDELINES

In June, 2021, the Mackenzie Valley Land and Water Board circulated an updated draft of the Guidelines for Closure and Reclamation Cost Estimates for Mines (Guidelines).

The purpose of the Guidelines are:

- Describe expectations for preparing closure cost estimates,
- Outline processes for determining how much security may be required for closure and reclamation, and
- Outline expectations and considerations for refunding security.

These are all issues that EMAB has concerns about, especially:

- Making sure there is enough security held to cover all closure costs.
- Holding back refunds of some security to ensure longterm monitoring and maintenance of potentially risky areas such as waste rock piles or tailings ponds.

EMAB had Slater Environmental assist with the review of the updated draft Guidelines. We made 29 comments and recommendations. Several other organizations also made comments. For a full list of EMAB recommendations on the Guidelines visit our website at: <u>www.emab.ca</u>.

SUMMARY OF EMAB RECOMMENDATIONS:

- Add a statement of guiding principles to the Guidelines, particularly that the estimated closure cost can never exceed the security deposit.
- EMAB noted the value of adding a section on security refunds and guidance on holdbacks. We made comments that in some cases holdback amounts may need to exceed the amount in the Guidelines, and that companies must provide a rationale for the holdback amount they propose.

EMAB reviewed the final Guidelines circulated by the MVLWB in January 2022. We were pleased that many of our comments and recommendations were incorporated by the MVLWB.

REVIEW OF REVISED DIAVIK RECLAIM ESTIMATES

EMAB made several comments on the security estimate for Diavik as part of our review of ICRP 4.1. WLWB directed Diavik to update its RECLAIM estimate in its Reasons for Decision on ICRP 4.1. Diavik submitted the updated RECLAIM adjustments in July 2021:

Adjustment Number	Adjustment	Increase
1	Update the RECLAIM to reflect a contingency of 15% for the Rock Pile and 20% for Buildings and Equipment.	\$5,181,123
2	Update the unit costs for building demolition with adjustment for inflation.	\$12,606,261
3	Update the RECLAIM to reflect an interim care and maintenance duration of three years.	\$6,097,438
4	Update the RECLAIM estimate to reflect the previously approved PKC Facility rock cover (i.e., a rock quantity that is based on a 2 m thickness and previously approved surface area).	\$14,081,440
5	Update the unit costs to reflect the GNWT's proposed adjustment for inflation.	\$9,216,779
6	Update the following costs to reflect the administrative errors identified through the public review: community engagement, Traditional Knowledge monitoring, 'Totals' in the Open Pit worksheet, 'Totals' in the Rock Pile worksheet, and 'Totals' in the ICM worksheet.	\$3,157,892
7	TK monitoring and community engagement	\$1,700,000
	TOTAL	\$52,040,933

The largest increase in security was for the PKC Facility rock cover, while the lowest was for TK monitoring and community engagement.

WLWB DECISION:

The WLWB approved Diavik's RECLAIM adjustments.

Total security held for Diavik under the water licence is now just under \$200 million dollars. There is also \$11 million held for the land leases and \$17 million under the Environmental Agreement.

REVIEW OF DIAVIK REQUEST FOR Security refund

In November 2021, Diavik submitted a request to the WLWB for a security refund for work done on the cover for the North Country Rock Pile and Removal of Treatment Chemicals along with background to justify its request.

EMAB reviewed the request with technical review from Slater Environmental, and made 20 recommendations. ENR Waters and Tłjcho Government also submitted comments.



NWRSA COVER PROGRESS

Diavik requested a partial refund of security for the NWRSA based on work done to the end of 2020:

- Rockfill Re-slope: 75%
- Till Placement: 72%
- Type I Rockfill Cover: 11%

EMAB's review identified where the work did not meet design criteria: till moisture content, amount of till and rock used in the cover, and thickness of the layers. This meant that Diavik's cost for completing the cover would likely be higher than estimated, so the amount requested for refund was likely too high as well. In addition there is uncertainty about whether the cover will perform as designed, and keep the rock pile frozen, so there needs to be a holdback until Diavik shows the cover is performing properly.

SUMMARY OF EMAB RECOMMENDATIONS:

Diavik should update its estimates of NWRSA percent complete based on lessons learned from work done to date. Diavik's security refund request should only be approved after it adjusts the amount to reflect issues with the work done so far, and the remaining work.

After reviewing the comments Diavik proposed halting its refund request while applying a new

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.

methodology developed with GNWT to support future refund requests for the NWRSA.

WLWB DECISION: The requested return of security associated with the NWRSA progressive reclamation is not approved.

The WLWB also required that Diavik describe the new methodology for supporting WRSA security refund requests. WLWB also set requirements for future Reclamation Completion Reports (RCR) on the NWRSA. RCR's should include an explanation of how all discrepancies will be resolved, information on till thickness, and evidence on long-term moisture content of till.

The WLWB also required Diavik to engage with GNWT on updates to holdback costs to align with the updated Closure Cost Estimating Guidelines (see p. 40), and then to update the holdbacks. It also directed Diavik to engage with TG on closure objectives related to the final shape and vegetation of the NWRSA.

TREATMENT CHEMICALS

As part of its security refund request, Diavik completed the removal of concentrated sulphuric acid from the mine site. The acid was a contingency measure for the North Inlet Water Treatment Plan if the pH of the system needed to be lowered. EMAB did not have any concerns on this part of the security refund request.

WLWB DECISION:

The WLWB approved Diavik's request for refund of security for removal of treatment chemicals.

EMAB's complete review of the security refund request is on our website: <u>www.emab.ca</u>.

NORTH WASTE ROCK STORAGE AREA — Instrument cluster location

Diavik submitted WRSA Instrument Location – Area 5 on July 14, 2021 as required by the WLWB in its initial approval of the NWRSA Cover Design. Diavik must install at least 5 instrumentation clusters to measure temperature and moisture in the rock pile cover to monitor whether it is freezing as predicted. Diavik chose a location on the north side of the pile, where moisture content was low.

EMAB reviewed Diavik's Instrumentation Location Area 5 and provided the following comments:

- Appendix VI-2 should include a map showing the locations of all five instrument clusters,
- EMAB accepts the WLWB rationale that the onus is on Diavik to demonstrate the cover is performing and that the instrumentation is in the proper location to monitor this, and
- Monitoring should focus on the south and west facing slopes where thawing would likely be greatest.

ENR and TG also made comments on the proposed instrument locations.

WLWB DECISION:

The WLWB approved Diavik's proposal. They directed Diavik to report annually on the results of the monitoring. They also required Diavik to provide a map showing the location of all the instrument locations in the next WRSA Closure Plan.

WILDLIFE MANAGEMENT AND MONITORING PROGRAM ENR WILDLIFE MONITORING WORKSHOP

In February 2021 ENR – Wildlife organized a workshop on monitoring of wildlife by Diavik and other NWT diamond mines. The workshop participants presented current studies and approaches to wildlife monitoring and discussed issues and approaches where there were differing views. These included caribou Zone of Influence (ZOI), caribou behaviour monitoring, and DNA monitoring for grizzly and wolverine. Mining companies, government wildlife managers, monitoring agencies and independent experts all participated.

Some highlights from EMAB's view:

- Investigating new methods for collecting ZOI data, such as drones or collar data.
- Testing of finer-scale data from modern caribou collars to assess caribou ZOI and caribou behaviour.
- ENR is developing new habitat models to help assess ZOI.
- All participants saw a need to better understand how mining activity affects caribou in order to develop more effective ways to minimize those effects.

EMAB objected to the final report of the workshop because it said there was general agreement among participants on wildlife monitoring issues that EMAB had not agreed to:

 EMAB did not agree that DNA monitoring of wolverine and grizzly populations is no longer needed. EMAB's view is that the monitoring should continue, but less often, to make sure the populations continue to remain stable.



- EMAB did not agree that monitoring caribou behaviour every year is not valuable and that mines could discontinue caribou behaviour monitoring. We acknowledged that there might be ways to do this better, but no details were discussed.
- EMAB did not agree that aerial surveys of caribou to determine the ZOI can be discontinued.

WILDLIFE MANAGEMENT & Monitoring Plan

The Wildlife Management and Monitoring Plan (WMMP) describes monitoring that must be done by Diavik. In April 2021, Diavik submitted their WMMP for review by the Minister of ENR. EMAB reviewed the WMMP and

WILDLIFE MONITORING AT DIAVIK

The Environmental Agreement requires Diavik to monitor the effects of the mine on wildlife.

Diavik has been monitoring wildlife since 2002.

In 2019 new Wildlife Act Regulations came into force that required Diavik to submit a Wildlife Management and Monitoring Plan for approval by the Minister of ENR.

In September 2020 ENR directed Diavik to submit an updated Wildlife Management and Monitoring Plan that met the requirements of the new regulations by April 1, 2021. After revisions, the WMMP was officially approved on July 15, 2022.

The study area for Diavik covers the East Island of Lac de Gras, where Diavik is Iocated, as well as the West Island and part of the mainland south of Diavik, covering an L-shaped area of 1,200 square kilometers.

The main species studied are raptors, barren-ground caribou, grizzly bear and wolverine, as well as the vegetation they eat. submitted comments to the Minister in June 2021. Our review can be found in EMAB's 2020-2021 Annual Report, with full details on our website: <u>www.emab.ca</u>.

The revised WMMP was similar to the previous version. EMAB was not satisfied with some areas of the revised WMMP, and sent follow-up recommendations to ENR on December 6, 2021:

EMAB RECOMMENDATION: Diavik should keep the grizzly hair snagging program and continue the survey at a decreased frequency. Diavik should develop triggers to reinstate annual hair snagging surveys.

EMAB RECOMMENDATION: Diavik should repeat wolverine hair snagging surveys every 4-6 years to confirm a stable population. Diavik should develop triggers to reinstate annual hair snagging surveys.

EMAB RECOMMENDATIONS: Diavik should fulfill their commitment #33 from the MVEIRB Environmental Assessment to update the WMMP to include the PK to Pits project predictions and commitments. This includes explaining how they will keep wildlife away from the pits when filling them.

ENR DECISION:

On July 15, 2022 the Minister approved Diavik's WMMP with seven conditions:

- Provide a detailed description of Diavik's caribou ZOI analysis methods six months before submission of the comprehensive WMMP report in 2023.
- Report annual estimates of ZOI every year that there is a large enough sample.
- Contribute to GNWT-coordinated aerial ZOI surveys if GNWT decides they are needed.
- Submit procedures for monitoring and deterring wildlife in the pit six months in advance of depositing PK into a pit.
- Increase the blast exclusion zone for caribou to at least 1 km.



- Work with EMAB to submit a plan, for approval, to improve caribou behaviour monitoring within four months ie. by mid-November
- Submit annual WMMP reports to ENR by April 30 each year. The next comprehensive analysis report will be submitted by April 30, 2023.

The approved WMMP did not include triggers for hair snagging for grizzly or wolverine. ENR will develop regional-level triggers for mine-related regional-level grizzly and wolverine monitoring.

2021 WILDLIFE MONITORING REPORT

Diavik submitted their 2021 Wildlife Monitoring Report (WMR) to EMAB and ENR-Wildlife on March 31, 2022. EMAB had Management and Solutions in Environmental Science Inc. (MSES) do a technical review.

For a full list of recommendations on Diavik's 2021 WMP, visit our website at: www.emab.ca.

Highlights from the 2021 WMR and EMAB's review:



BARREN GROUND CARIBOU

Diavik's caribou research focuses on the Bathurst herd. The Bathurst travel through the area of Lac de Gras during their annual migrations. The Beverly/Ahiak herd has also been sighted within the area of Lac de Gras in recent winters. This herd is also considered to be affected by Diavik's mining activity.

Diavik's monitoring of caribou includes:

- Monitoring the Zone of Influence (ZOI) of the mine,
- Collection and analysis of behavioral data,
- Monitoring movement of the caribou herds, and
- Recording caribou incidents and fatalities that are a result of the mine.

ZONE OF INFLUENCE

A Zone of Influence (ZOI) is the area surrounding the mine where behaviour and distribution of wildlife is affected by the mine. Diavik did not complete any additional analyses for ZOI monitoring of caribou for the 2021 WMR. Diavik continues to state that based on its analysis there is no ZOI around the mine. Diavik's ZOI analysis looks only at aerial survey data, which has not been collected since 2013. Diavik identified mine activities that are monitored, including dust deposition, flights and blasts, and waste rock hauled. They concluded that evidence shows no response or a weak response by caribou to these disturbances. EMAB and ENR disagree with Diavik and continue to view previous studies by Boulanger showing a 14 km. ZOI around Diavik as more credible.

The recently approved WMMP requires that Diavik continue to do ZOI analysis and present results every year there is a large enough sample.

EMAB RECOMMENDATION: Diavik should develop monitoring techniques to identify mine-related sources of sensory disturbances and new methods for monitoring caribou abundance and distribution relative to the mine whenever caribou are in the area.

GRIZZLY BEARS

Diavik tracks grizzly bear abundance and distribution. In the past, they have shown the mine has little impact on grizzly bear population using hair snagging surveys. Diavik has decided to end the hair snagging surveying program, with ENR's approval.

ENR has committed to develop triggers to reinstate the grizzly bear hair snagging program, as recommended by EMAB.

There were no relocations, and no grizzly bear minerelated mortalities in 2021. Although the grizzly bear population around Diavik is stable, that does not mean incidents do not occur. There were 41 deterrent actions taken against grizzly bears in 2021. These deterrents include trucks, bear bangers, rubber bullets, cracker shells, gun cycles (noise), yelling, and clapping.

WOLVERINE

Diavik provides estimates of wolverine abundance and distribution in the study area over time. Diavik conducted hair snagging surveys to help track abundance and distribution of wolverines, but have not conducted a survey since 2014. In 2021, Diavik decided to end the program, with approval from ENR.

ENR has committed to develop triggers to reinstate the wolverine hair snagging program, as recommended by EMAB.

Snow track surveys help give Diavik an idea of wolverine use of an area. The surveys do not give an exact number of wolverines, but provide a general idea of whether wolverines are in the area. Snow tracks can often be covered up by drifting snow in windy conditions. This can make them hard or impossible to detect.

In 2021, Diavik surveyed 39 transects. Wolverine tracks were identified at 18 of the 39 transects. Since only one survey was completed in 2021, detection rates could not be calculated. There were six sightings of wolverine on the mine site without incident. No deterrents were used during any of these observations.

RAPTORS

Diavik completed 67 pit wall and infrastructure inspections in 2021 to determine use by raptors. They recorded two rough legged hawk nests in 2021. Both nests observed saw 3 nestlings hatched.

Two raptor mortalities occurred in 2021. Diavik reported the causes of both mortalities as unknown. They stated that because both mortalities were observed near pit roads they were likely a result of collisions with vehicles.

The next regional nest monitoring is scheduled to occur in 2025. This is a more in-depth survey of raptors on site.

EMAB RECOMMENDATION: Diavik should develop a figure showing the number of mine-related incidents and mortalities by year in each future monitoring report.

WASTE MANAGEMENT

Food waste at Diavik must be disposed of properly to limit the attraction of wildlife. EMAB believes the overall outcome of waste management at Diavik appears to be positive.

<u>COMPREHENSIVE VEGETATION AND LICHEN ANALYSIS</u> <u>Report</u>

The Comprehensive Vegetation and Lichen Analysis Report looks at the impacts of dust and contamination from the mine every three to five years. This program monitors the amount of plants, lichen and moss, and monitors the level of contaminants in lichens. The study found significantly higher concentrations of dust on plants near the mine during open pit mine construction, and mining, and underground

mine construction, when compared to the periods of underground mining alone. The vegetation data showed differences in species abundance and community composition over time that were likely due to mine related effects.

EMAB RECOMMENDATION: Diavik should discuss if any mitigation measures are being used to reduce levels of dust deposition and whether any non-native plant species have been found in any of the monitoring plots.





Snow core sample being weighed, with dustfall gauge in background



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 an EAQMP annually.

2020 EAQMP ANNUAL REPORT

Diavik submitted its 2020 EAQMP in July 2021. EMAB had Arcadis do a technical review of the annual report and submitted 5 recommendations to Diavik on March 17, 2022.

For a full list of recommendations on Diavik's 2020 EAQMP visit our website: <u>www.emab.ca</u>.

DUSTFALL MONITORING

Diavik monitors dustfall at the mine. Dustfall is the amount of total suspended particulate (TSP) that falls out of the air and settles on the ground. Larger, heavier particles are not able to travel as far and settle closer to the mine, while smaller dust particles can be carried farther from the mine in the wind. Diavik measures dustfall at different distances from the mine. They collect dust with dust gauges and snow core samples, and test for chemicals in the dust. Dustfall and snow core monitoring show that A21 open pit operations are impacting dust levels off-site.

Diavik's annual Report indicated that the main source of dust was from unpaved roads and the airstrip, and mining of the A21 open pit.

EMAB RECOMMENDATION: A detailed comparison of monitored and modelled dustfall should be included with the EAQMP Report.

DIAVIK RESPONSE: Comparing modelled and measured dustfall rates is of limited value on a year-to-year basis. The model was run for one year of meteorology (2002) that is not necessarily representative of any other specific year.

GREENHOUSE GAS EMISSIONS

Diavik calculates Green House Gas (GHG) emissions as part of the EAQMP.

EMAB RECOMMENDATION: Details of GHG calculations should be included in the EAQMP Report, or a reference to an external document with those details, to allow for validation of methods and quantities reported.

DIAVIK RESPONSE: Diavik uses equations from the most current Quantifications Requirement document available on the Canada.ca webpage to calculate emissions reported through the GHGRP.

Diavik gave a more in depth explanation on National Pollutant Release Inventory (NPRI) and GHG emissions, outlining specific equations used for the calculations.

YELLOW HAZE

EMAB has raised concerns about the yellow haze over Diavik during the cold winter months for several years. In March 2020, EMAB recommended Diavik sample the yellow haze. Diavik responded that they were unaware of a yellow haze phenomenon, and that they have not seen a yellow haze over the mine. Diavik noted that they monitor air quality and effects of air emissions on vegetation and have not found any significant effects.

EMAB's technical experts at Arcadis have reviewed the issue. They say it's likely that the yellow haze is due to air pollution related to combustion (Nitrogen oxides from vehicle exhaust, generators, boilers etc.) during temperature inversion conditions.



Calm winds and the inversion result in poor air quality.

EMAB recommended Diavik sample for nitrogen dioxide (NO₂) and to do a visual confirmation to know which sampling dates took place during a yellow haze event. This way Diavik can compare data from yellow haze events to data from when there is no yellow haze.



Diavik's showing Board Members Diavik's TSP monitor

In March 2022, EMAB sent Diavik a recommendation to sample the yellow haze for the third time.

SUMMARY OF EMAB RECOMMENDATIONS AND DIAVIK RESPONSES

EMAB RECOMMENDATION:

Diavik should monitor for yellow haze using hand-held nitrogen dioxide (NO₂) monitors.

EMAB RECOMMENDATION: Diavik should do a visual confirmation of presence of yellow haze by driving 5 km from the mine on the winter road and taking a picture.

DIAVIK RESPONSE: Diavik will purchase a handheld monitor for a one-year monitoring program. It will do handheld air quality measurements and confirmatory photos when possible.

Diavik cannot commit to daily sampling but will monitor once per week at the four recommended locations. Driving on the ice road every day is a safety risk so Diavik will do visual confirmations when environment staff are in the field for other work.

EMAB has asked Diavik to clarify some parts of their response, including details of the plan. We recommended they sample during the coldest part of the year from December to March.

Diavik replied that they are putting the yellow haze sampling on hold until the GNWT Air Quality Guidelines are developed.

MINISTERIAL REVIEW OF EAQMMP V2.0 AND GNWT AIR QUALITY GUIDELINE

This section updates the Annual Report section from last year.

EMAB requested the Minister investigate Diavik's Air Quality Monitoring Program (EAQMP) on July 31, 2020. Our technical analysis showed the program was inadequate. The Minister decided GNWT would develop an Air Quality Guideline before investigating Diavik's EAQMP. The Guideline will be used by ENR to help in the review of Diavik's EAQMP. The Guideline will cover the ways mines monitor air quality, and how often monitoring should take place. It also covers where monitoring stations should be placed, and methods to ensure quality data is collected (quality assurance/quality control [QA/QC]):

> GNWT planned to develop the Guideline in fall 2021, review the EAQMP in winter 2022 and issue a Minister's report by March 2022.The Guideline development has been delayed. EMAB received the GNWT draft Guideline for Air Quality Monitoring for Diamond Mines in the NWT on January 18, 2022 and made 17 recommendations. Here are some key points:

TSP MONITORING

EMAB was concerned when Diavik ended their TSP monitoring in 2019. EMAB was pleased to see that the draft guidelines require TSP monitoring.

EMAB RECOMMENDATION: Diavik should specify significant sources of TSP that should be considered when selecting monitoring sites, such as open pits, roads and crushers.

MONITORING EQUIPMENT, DATA COMPLETENESS AND QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

EMAB has expressed concern about long periods when Diavik was not collecting TSP data due to equipment breakdown, or data reliability due to inadequate maintenance and calibration.

EMAB RECOMMENDATION: Proponents should have equipment that can withstand cold temperatures, and have dedicated staff to download data on a regular basis. Back up equipment should be kept on site in case replacements are needed.

The guidelines require 75% data completeness, with a target of 90%.

EMAB RECOMMENDATION: If TSP data results are below the required 75% completeness, proponents should have to explain what caused the lack of data collection, with evidence, and propose a plan of action to avoid the problem in the future.

SCHEDULE FOR REVIEW OF DIAVIK EAQMP

GNWT now hopes to provide the consultation document by November 2022 with the Final Guideline by December 2022. They would do the review of Diavik's EAQMP in January 2023, then allow Diavik 60 days to respond.

ENVIRONMENTAL AGREEMENT ANNUAL REPORT

As part of the EA, Diavik must submit an Annual Report to the Parties, the Government of Nunavut, and EMAB. 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 2020 EAAR on July 1, 2021. EMAB reviewed the report and submitted 15 recommendations. All recommendations can be found on EMAB's website.

A key EMAB recommendation was:

EMAB RECOMMENDATION: EMAB found Diavik's EAQMP to be inadequate because it did not meet Environmental Agreement commitments to monitor Total Suspended Particulates. This should be reported in the EAAR.

Diavik sent back a revised EAAR on September 1, 2021 to EMAB and the Minister. EMAB stated that our comments had been adequately addressed.

MINISTER DECISION: On December 7, 2021 the Minister determined that the 2020 EAAR was satisfactory.

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 was generally 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 of 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 commented on two of the six documents listed in the Table of Reviewer Responses. They did not intervene at the Water Licence Amendment Proceeding for Progressive Reclamation, although they did participate in the Technical Session.

EMAB notes that DFO has an ongoing process to implement the amended *Fisheries Act* 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 one of the reports listed. They did not intervene at the Water Licence Amendment Proceeding for Progressive Reclamation, although they did participate in the Technical Session. Inspections in 2021-22 returned to in-person after relaxing of COVID-19 restrictions. The Inspector visited the Diavik mine site eight times during the year. The Inspector made one presentation to EMAB throughout the year on the results of the inspections. The Inspector commented on Diavik's water licence amendment application for Progressive Reclamation, attended the Technical Session and commented on the draft water licence; otherwise he did not comment on any reports.

TABLE OF REVIEWER RESPONSES

Reviewer	ECCC	DFO	ENR	ЕМАВ
2017-19 AEMP Re-evaluation Report Addendum	no comments	commented	commented	commented
2020 AEMP Report	no comments	no comments	commented	commented
2021 AEMP Report	no comments	no comments	commented	commented
AEMP Design Plan Version 6	no comments	commented	commented	commented
Water Licence Amendment – Progressive Reclamation	no intervention	no intervention	intervened	intervened
PKC Management Plan	commented	no comment	commented	commented

ENR-Waters commented on all the reports we looked at and fully participated in the Progressive Reclamation Water Licence Amendment Proceeding. We commend their continued thorough and substantive reviews of the Diavik Water Licence plans and reports. We note that ENR-Wildlife has not been involved in any wildlife-related aspects of Diavik's closure planning.

The WLWB consistently provides detailed reviews of all documents submitted by Diavik for review.

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

WILDLIFE MONITORING

The improvement in Diavik's responses to EMAB's recommendations on wildlife monitoring continued in 2021-22, following implementation of EMAB's new recommendation tracking system.



• Diavik's responses on the 2020 WMP report were all within the 60-day period required by the Environmental Agreement (EA).



ENR-Wildlife involvement with Diavik's wildlife monitoring was variable in 2021:

- Did not review the 2020 WMP report.
 - Six months late responding to EMAB recommendations on 2020 WMP report.
- ENR-Wildlife approved Diavik's new WMMP program description under Section 95 of the Wildlife Act in July 2022 with 7 conditions (see p. 46-47).

AIR QUALITY MONITORING

Diavik's response to EMAB's recommendations on air quality monitoring continued to be improved in 2021-22, following implementation of EMAB's new recommendation tracking system.

Diavik submitted the 2020 EAQMP report and EMAB's review is discussed earlier in this report. EMAB made 5 recommendations and Diavik's response was within the 60-day period required by the EA.

EMAB made 2 recommendations regarding yellow haze sampling and Diavik's response was within the 60-day period required by the EA.

As reported in EMAB's 2020-21 Annual Report, and updated earlier in this report, EMAB requested the Minister investigate whether Diavik's Air Quality Monitoring Program was adequate. This request was made in July 2020. ENR-Air Quality now expects this investigation to be complete in early 2023, almost three years after EMAB made its request.

To EMAB's knowledge ENR - Air Quality did not make any comments on Diavik's 2020 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).



COMMUNICATIONS

ANNUAL GENERAL MEETING (AGM)

Each fall, 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 2021, EMAB's AGM was delayed until November due to the Covid-19 pandemic. We held our AGM through a combination of virtual and inperson participation. We revised the by-laws to give the Executive members a three-year term. Charlie Catholique was re-elected as Chair, Jack Kaniak was re-elected Vice Chair and Violet Camsell-Blondin was re-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. Due to Covid-19 and concerns from communities we did not hold any community updates in 2021-2022.



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 9:00 a.m. – 5:00 p.m. Monday to Friday. EMAB's library was restricted due to public health measures during the Covid-19 pandemic.

Much of our information is also available on our website, www.emab.ca

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, www.**emab.ca** and our Facebook page, **facebook.com/EMAB2015**.

ANNUAL REPORT

EMAB circulates its annual report and a plain language summary to all Parties to the Environmental Agreement, as well as key leaders in the Affected Communities and throughout the NWT. It is also posted to our website.

BROCHURE AND POSTER

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

EMAB GOVERNANCE AND OPERATIONS

Mine Site 2022

The Board met five times in 2021-22; four Board meetings took place as a combination of face-to-face meetings and teleconference to respect COVID-19 restrictions while meeting the needs of our Board members, as well as one conference call. The Annual General Meeting took place on November 9. The Board passed 29 email motions over the year.

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Yellowknife Dene First Nation appointed new Board members in 2021-22; Ryan Miller replaced Femi Baiyewun in March '22. Femi replaced Sarah Gillis in July '21. All other members are continuing, and Canada's seat remains vacant.

BUDGET AND FINANCE

EMAB's budget for 2021-22 was \$528,200. EMAB spent \$436,379 during the year. Remaining funds will be rolled over to the 2022-23 budget.

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 \$528,200 in 2021. To conduct any activities above and beyond those budgeted EMAB must submit a separate funding request to Diavik for approval.

EMAB will recommend our two-year budget for 2023-25 to Diavik in September.



DIAVIK SITE VISIT

Board members and staff had a site tour of Diavik in June 2022, the first one since June 2019, due to restrictions set by the Chief Public Health Officer and Diavik. The tour was comprehensive, focusing on closure of various components, and included invitees from communities and regulators.

ACTION PLAN

EMAB finalized and adopted an Action Plan for 2019-24 during 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 a 1-2 page meeting summaries to Parties; these are now sent after each meeting.
- Continuing assessment of Diavik response to TK Panel recommendations; this is ongoing.

- Developing a 1-page summary of the role of EMAB Board members; this is ongoing.
- Addressing potential for conflict of interest at Board meetings through a broader COI policy; this is being finalized with legal advice.

CONFLICT OF INTEREST

The Board discussed the potential for conflict of interest (COI) where a member's Party may have a financial interest in the decision, along with expanding EMAB's current COI policy. These were complicated and difficult discussions with a number of different points of view. EMAB finalized the policy early in August 2022.

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 have been circulated to the Parties to the Environmental Agreement for review and comment. Only one Party has agreed to the proposed amendments to date.

OPERATIONS

Mohannad Elsalhy is EMAB's Environmental Specialist since August 2022. John McCullum has been the Executive Director since November 2015.

EMAB's Operations Manual was reviewed and updated.

EMAB's office building was sold and EMAB negotiated a lease for the same location with the new owners.

WHAT ARE EMAB'S PLANS

With COVID restrictions relaxed EMAB is planning on a more normal year for 2022-23, including community updates and in-person meetings. We will continue to maintain awareness of COVID-19 and to follow the guidance of the Chief Public Health Officer.

Our priorities for 2022-23 will continue to focus on closure plan developments. Other planned activities include:

OVERSIGHT AND MONITORING

Review Diavik's Final Closure and Reclamation Plan submission.

Participate in ENR Ministerial investigation of adequacy of current Environmental Air Quality Monitoring Program.

Track the new Wildlife Management and Monitoring Plan description that Diavik submitted to ENR.

Continue participation in GNWT-Lands initiative to develop regulations for the *Public Lands Act*.

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 mine sites.

Review Reports:

- 2022 AEMP Annual Report.
- AEMP Annual Version 6.0.
- 2022 WMMP Report.
- 2022 EAQMP Report.
- ICRP Progress Report and draft Final Closure Plan.
- 2022 EAAR.

ABORIGINAL AND COMMUNITY INVOLVEMENT

- Attend Traditional Knowledge Panel meetings as possible keeping COVID-19 guidance in mind.
- Engage Communities through Board members and community update meetings keeping COVID-19 guidance in mind.
- Assess implementation of TK Recommendations including assessment of Diavik response and followup.

COMMUNICATIONS

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

GOVERNANCE

- Hold regular meetings while respecting COVID-19 guidance.
- Oversee EMAB operations.
- Review and continue to 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, 2022, 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 and other schedules and supplementary information.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the organization as at March 31, 2022, and its results of operations and its cash flows for the year then ended in accordance with ASNPO.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the organization in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

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 organization 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 organization'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 organization'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 organization 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 Yellar Knife Accounting Put lovp.

Yellowknife, NT October 6, 2022

EPR Yellowknife Accounting Professional Corporation Chartered Professional Accountants

ENVIRONMENTAL MONITORING ADVISORY BOARD Statement of Operations For the year ended March 31, 2022

	2022 Budget	2022 Actual	2021 Actual
Revenues			
Diavik Diamond Mines Inc.	\$ 527,300	\$ 527,300	\$ 516,960
Transfer to deferred revenue - annual surplus	-	(95,630)	-
Transfer to (from) deferred revenue	-	(111,134)	111,134
Contributions repaid (repayable)	-	111,134	(111,134)
Interest income	900	1,044	1,604
	528,200	432,714	518,564
Expenditures			
Amortization	-	3,665	3,925
Administration, Schedule 1	67,679	71,249	71,717
Management Services, Schedule 2	187,350	185,798	201,210
Governance, Schedule 3	109,825	98,011	99,045
Oversight and monitoring, Schedule 4	131,096	67,277	115,468
Involving and supporting communities, Schedule 5	22,250	-	406
Communications, Schedule 6	 10,000	10,379	10,037
	528,200	436,379	501,808
Surplus (deficit) before transfer of capital items	-	(3,665)	16,756
Other item			
Transfer to Tangible Capital Asset Fund	-	3,665	3,925
Purchase of capital assets	-	-	(20,681)
	-	3,665	(16,756)
Surplus for the year	\$ -	\$ -	\$ -

ENVIRONMENTAL MONITORING ADVISORY BOARD Statement of Changes in Net Assets For the year ended March 31, 2022

	C)perating Fund	Cap	Tangible ital Asset Fund	Total 2022	Total 2021
Balance, opening	\$	-	\$	21,200	\$ 21,200	\$ 4,444
Surplus		-		-	-	-
Amortization		(3,665)		-	(3,665)	(3,925)
Additions		-		-	-	20,681
Transfer from operating fund		3,665		(3,665)	-	
Balance, closing	\$	-	\$	17,535	\$ 17,535	\$ 21,200

ENVIRONMENTAL MONITORING ADVISORY BOARD Statement of Financial Position As at March 31, 2022

		2022		2021
ASSETS				
Current				
Cash	\$	23.348	\$	31 192
Prepaid expenses	9	1 278	Ψ	3 715
Restricted cash (Note 3)		644,173		680,418
		668,799		715,325
Tangible Capital Assets (Note 4)		17,534		21,200
	\$	686,333	\$	736,525
LIABILITIES				
Current				
Accounts payable and accrued liabilities (Note 5)	¢	25 222	¢	76 801
Deferred revenue (Note 6)	Φ	53,343	Φ	70,091
Contributions repayable (Note 7)		033,475		527,500
		-		111,134
		668,798		715,325
Net Assets		17,535		21,200
	\$	686,333	\$	736,525

APPROVED ON BEHALF OF THE BOARD

, Member

- V Cellondin Member

ENVIRONMENTAL MONITORING ADVISORY BOARD Statement of Cash Flows For the year ended March 31, 2022

	 2022	2021
Operating activities		
Surplus	\$ -	\$ -
Change in non-cash working capital items		
Decrease in prepaid expenses	2,437	1,637
(Decrease) increase in accounts payable and accrued liabilities	(41,567)	47,813
Increase (decrease) in deferred revenue	106,175	(100,794)
(Decrease) increase in contributions repayable	(111,134)	110,256
(Decrease) increase in cash	(44,089)	58,912
Cash, opening	711,610	652,698
Cash, closing	\$ 667,521	\$ 711,610
Cash consists of:		
Cash	\$ 23,348	\$ 31,192
Restricted cash	644,173	680,418
	\$ 667,521	\$ 711,610

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)(1) 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.

(c) *Tangible capital assets*

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Tangible capital assets are recorded at original cost plus any costs of betterment less accumulated amortization and excludes any assets not in current use. Amortization is calculated when the tangible capital assets are ready in use by the declining balance at rates set out in note 4.

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 prepaid expenses, accounts payable and accrued liabilities, deferred revenue and contributions repayable..

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.

	 2022	2021
Carried forward funding Cash received in advance for the 2021/2022 fiscal year Cash received in advance for the 2022/2023 fiscal year	\$ 217,462	\$ 153,118 527,300
	\$ 644,173	\$ 680,418

4. TANGIBLE CAPITAL ASSETS

				2022	2021
	 Cost	Acc am	cumulated ortization	Net	Net
Office equipment Furniture and fixtures Computer equipment	\$ 33,017 24,209 81,575	\$	32,471 23,343 65,453	\$ 546 866 16,122	\$ 780 1,238 19,182
	\$ 138,801	\$	121,267	\$ 17,534	\$ 21,200

5. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

	 2022	2021
Trade accounts payable Accrued payroll	\$ 17,572 9,257	\$ 63,121 7,529
Government remittance	 8,494	6,241
	\$ 35,323	\$ 76,891
6. **DEFERRED REVENUE**

			Balance, opening	Received	R	ecognized	Repaid	Balance, closing
Diavik Inc.	Diamond	Mines	\$ 527,300	\$ 426,711	\$	(432,714)	\$ 111,178	\$ 633,475

7. CONTRIBUTIONS REPAYABLE

	 2022		2021
Diavik Diamond Mines Inc.	\$ -	\$	111,134

8. COVID-19

On March 11, 2020, the World Health Organization categorized COVID-19 as a pandemic. The potential economic effects within the Board's environment and in the global markets due to the possible disruption in supply chains, and measures being introduced at various levels of government to curtail the spread of the virus (such as travel restrictions, closures of non-essential municipal and private operations, imposition of quarantines and social distancing) could have a material impact on the Board's operations.

The extent of the impact of this outbreak and related containment measures on the Board's operations cannot be reliably estimated at this time.

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 \$657,521 (2021 - \$611,610) 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.

11. COMMITMENTS

The Board is committed to a lease of office space until December 31, 2022. The Board has the option to renew the lease for an additional one-year period ended December 31, 2023 with the same terms and conditions. The lease was payable \$2,493.75 per month (inc. GST) to December 31, 2021. The lease payable increased January 1, 2022 to \$2,543.63 per month (inc. GST), an increase of 2%.

ENVIRONMENTAL MONITORING ADVISORY BOARD **Schedules of Expenditures** For the year ended March 31, 2022

SCHEDULE OF ADMINISTRATION			5	Schedule 1
	2022 Budget	2022 Actual		2021 Actual
Audit fees	\$ 8,000	\$ 7,980	\$	7,980
Bank charges and interest	800	865		873
Bookkeeping fees	4,500	4,336		4,110
Capital equipment	1,150	-		-
Insurance	4,319	4,319		4,195
Janitorial	3,000	1,005		2,205
Library/Publications	200	-		227
Office supplies	2,750	1,710		2,565
Postage and freight	510	714		190
Printing and photocopy	2,100	1,751		1,847
Professional fees	1,050	6,127		5,410
Rent	31,500	31,650		31,500
Repairs and maintenance	1,000	2,580		162
Telephone and internet	6,800	8,212		10,453
	\$ 67,679	\$ 71,249	\$	71,717
SCHEDULE OF MANAGEMENT SERVICES			1	Schedule 2
	2022 Budget	2022 Actual		2021 Actual

Employee benefits \$ 19,300 21,069 \$ 18,485 \$ Employer's costs - CPP, EI, WSCC 12,650 14,339 14,109 Professional development 5,400 -Salaries 166,013 150,000 152,974 Travel --187,350 185,798 \$ 201,210 \$ \$

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ENVIRONMENTAL MONITORING ADVISORY BOARD Schedules of Expenditures For the year ended March 31, 2022

SCHEDULE OF GOVERNANCE					:	Schedule 3
		2022 Budget		2022 Actual		2021 Actual
Accommodations	\$	7.300	\$	5.803	\$	4.206
Board of directors training	Ŷ	1,100	Ψ	-	Ψ	-
Executive Committee		4,975		4,475		4.877
Honoraria and teleconference		32.637		22,782		26.010
Meeting expenses		1.000		51		315
Per diems		5.000		5,146		4.822
Personnel committee		1.245		_		-
Preparation		48,768		52,871		50,601
Transportation		6,550		6,688		8.034
Board equipment		1,250		195		180
		,				
	\$	109,825	\$	98,011	\$	99,045
SCHEDULE OF OVERSIGHT AND MONITORING					;	Schedule 4
		2022 Budget		2022 Actual		2021 Actual
Aquatic Effects Monitoring Program	\$	46.000	\$	30.543	\$	14.984
Air Quality Management Program	Ψ	7 400	Ψ	8 090	Ψ	9 240
Interim Closure and Reclamation		46 196		3 570		27 165
Other reviews and reports		18 500		9 401		34 109
Traditional Knowledge Panel Review		13.000		-		-
Wildlife Monitoring Plan		-		15,673		29,970
	\$	131,096	\$	67,277	\$	115,468

ENVIRONMENTAL MONITORING ADVISORY BOARD Schedules of Expenditures For the year ended March 31, 2022

CHEDULE OF INVOLVING AND SUPPORTING COMMUNITIES					5	Schedule 5	
		2022 Budget		2022 Actual		2021 Actual	
Board member consultation honoraria	\$	2,450	\$	-	\$	406	
Kitikmeot Inuit Association		6,450		-		-	
Lutsel K'e		5,800		-		-	
North Slave Metis Alliance		1,900		-		-	
T'licho Government		3,200		-		-	
Yellowknives Dene First Nation		2,450				-	
	\$	22,250	\$	-	\$	406	

SCHEDULE OF COMMUNICATIONS

2022 2022 2021 Budget Actual Actual Advertising, public relations and promotions \$ \$ 2,010 1,750 371 \$ Annual report 8,250 10,008 7,869 Website maintenance 158 --\$ 10,000 \$ 10,037 10,379 \$

Schedule 6

EMAB RECOMMENDATIONS

EMAB RECOMMENDATIONS TABLE 2021-2022

AEMP Design Plan Version 6

EMAB submitted 21 recommendations to Diavik via the WLWB on AEMP Design Plan Version 6. Highlights can be found on pages 27-28. The complete list of recommendations can be found on the WLWB Public Registry.

AEMP 2021

EMAB submitted 23 recommendations to Diavik via the WLWB on AEMP 2021. Highlights can be found on pages 28-29. The complete list of recommendations can be found on the WLWB Public Registry.

Water Licence Amendment: Progressive Reclamation

EMAB submitted 22 recommendations to Diavik via the WLWB on the Water Licence Amendment: Progressive Reclamation. Highlights can be found on pages 31-33. The complete list of recommendations can be found on the WLWB Public Registry.

Draft Water Licence - Diavik Water Licence Amendment - Progressive Reclamation

EMAB submitted 19 recommendations to Diavik via the WLWB on the Water Licence Amendment: Progressive Reclamation - Draft Water Licence. Highlights can be found on pages 33-34. The complete list of recommendations can be found on the WLWB Public Registry.

PK to Pits Engagement Plan

EMAB submitted 8 recommendations to Diavik via the WLWB on the PK to Pits Engagement Plan. Highlights can be found on pages 34-35. The complete list of recommendations can be found on the WLWB Public Registry.

PKC Management Plan Version 6

EMAB submitted 15 recommendations to Diavik via the WLWB on the PKC Management Plan Version 6. Highlights can be found on pages 35-37. The complete list of recommendations can be found on the WLWB Public Registry.

Contingency Plan Version 23

EMAB submitted 3 recommendations to Diavik via the WLWB on the Contingency Plan Version 23. Highlights can be found on page 38. The complete list of recommendations can be found on the WLWB Public Registries.

2020 EAAR

EMAB submitted 15 recommendations to Diavik on the DRAFT 2020 EAAR. Diavik addressed most of the recommendations so EMAB did not comment on the Final Version of the 2020 EAAR. Highlights can be found on page 53. The complete list of recommendations can be found on our website: emab.ca.

2020 EAQMP Report

EMAB submitted 7 recommendations to Diavik on the 2020 EAQMP Report and Yellow Haze issue. Highlights can be found on pages 50-52. 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
DDMI-EAQ-22: With the unknown source for the elevated dustfall estimated at Dust 11, EMAB recommends introduction of two (2) temporary stations to the north and east of the current Dust 11 station location, where the source of the dust can likely be verified.	The dustfall deposition rates found at Dust 11 are most likely a result of dust emissions from A21 and from the South Country Rock Pile (SCRP). Dust 11 is downwind of the A21 pit and with the activity at that location there are significant emissions of dust. In addition, the SCRP, where material from A21 is dumped, is located to the east of Dust 11 and is also a source of dust emissions. The combination of these two sources results in higher then expected dustfall rates at Dust 11. Dust 10, which is immediately to the west of A21 had dustfall rates approximately twice as high as Dust 11 which is consistent with its location. Dust 12 which is further afield from both A21 and SCRP has dustfall rates that are roughly half the rate at Dust 11. Therefore, the dustfall rates at Dust 10, 11, and 12 are entirely consistent with dust emissions at A21 and SCRP when the distances from those sources to the sampling location are taken into account. There is not a need for additional dustfall monitoring locations to determine the sources of dustfall at Dust 11.
DDMI-EAQ-23 : Data pertaining to meteorological observations and records of on-site activities, including any visual dust observation and mitigation logs, be used to document the cause/rationale for events of high dustfall values measured at the various stations.	In Section 2.4 of the 2020 Air Quality Monitoring Report there is discussion around watering of roads, dust deposition rates near ice roads, haulage of waste rock and ore etc. and associated effects on site. The information already provided in this section is sufficient to understand the effects of activities onsite to overall dustfall rates. The frequency of dustfall monitoring does not allow for individual dust events to be captured or explained, only the overall seasonal or annual emissions can be resolved.
DDMI-EAQ-24: A detailed comparison of monitored and modelled dustfall should be included within the EAQMP Report.	Comparing modelled and measured dustfall rates is of limited value on a year-to-year basis. Firstly, the model was run for one year of meteorology (2002) that is not necessarily representative of any other specific year. Wind speed and direction are naturally variable, which will result in spatially varying dust deposition rates from year to year. Secondly, particulate matter emission rates and locations will vary as mining activity changes. The modelled emission year (2015) is different from emissions during other years. The year-to year variability in meteorology and emissions is reflected by the year-to-year variability of dustfall deposition rates at measurement sites presented in the EAQMP Report (see Figures 3.1-2 and 3.1-3 in the 2020 Dust Deposition Report). Additionally, the results of the modelled dust deposition only include locations greater than 250 metres from the mine area boundary and many of the monitoring locations are within this range and therefore cannot be compared. Background dust deposition rates were also assumed to be zero which, based on the results of the control sites, is an underestimation.
DDMI-EAQ-25: Details of the NPRI and GHG calculations should be included, or amended as an included document, to allow for validation of methods and quantities reported.	Calculation inputs vary based on emission source and may include fuel usage or operating hour statistics. DDMI uses equations from the most current Quantifications Requirement document available on the canada. ca webpage (Canadas Greenhouse Reporting Program - Quantification Requirements) to calculate emissions reported through the GHGRP. More specifically, equations 2-2, 2-13, 11-18 and 11-19 are used to calculate total CO2, CH4, and N2O in the reporting year. The NPRI is more complex and involves a number of workbooks to calculate total emissions. The workbooks are available from the NPRI toolbox webpage https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/tools-calculating-emissions.html#n6. As an example, DDMI uses the workbook "Large Stationary Fuel" to calculate emissions from diesel fuel used to generate power at site. The diesel-powered generators are one of the main contributors of NOX and CO emissions at Diavik.

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DDMI-EAQ-26: The 2012 dispersion modelling assessment should be updated to reflect current operations and be used to evaluate the appropriate locations for assessment of dustfall observations with predicted concentrations within the updated assessment	For the same reasons that comparing modelled and measured dustfall for previous modelling studies are not recommended (see DDMI-EAQ-24 above), conducting additional modelling is not recommended. The general locations where increased dustfall are expected are downwind of emissions sources and these regions already have dustfall stations. Additional modelling is not needed to locate these areas and continued monitoring will provide a more accurate assessment of actual dustfall deposition rates than would modelling.
DDMI-EAQ-27: Diavik should monitor for yellow haze - with the use of hand-held nitrogen dioxide (NO2) monitors following the methods described in Arcadis's July 2021 Memo.	DDMI will purchase a handheld monitor for a one-year monitoring program, inclusive of handheld air quality measurements and confirmatory photos when possible, to assess the yellow haze phenomenon.
DDMI-EAQ-28: NO2 monitoring should be accompanied by visual confirmation of presence of yellow haze. This should be done by driving 5 km south of the mine site on the ice road for a visual check, and photograph. Measurements of NO2 and a visual confirmation should be done daily, and at similar times of day, coinciding with the ice road season. Alternate locations (for visual confirmation) with access via snowmobile should be included in the monitoring plan for additional confirmation. Photographs should be taken with the sun behind the photographer.	Due to operational contraints and safety risks, DDMI cannot commit to daily sampling as per the recommendation by Arcadis but will commit to a monitoring frequency of once per week at the four locations proposed by Arcadis. The winter road season is busy with heavy vehicle traffic; hence, DDMI considers daily access of the road to monitor the yellow haze phenomenon as a safety risk for both site personnel and other winter road users. Instead, visual confirmations (i.e. photographs) of the site horizon will be completed during existing winter programs (wolverine track surveys, AEMP etc.) when environment personnel are in the field. In addition, DDMI will also take a horizon photo at each of the four locations when conducting the weekly air quality monitoring events.

2020 WMP Report

EMAB submitted 17 recommendations to Diavik and 4 recommendations to the GNWT-ENR on the 2020 WMP Report. These recommendations were included in last year's Annual Report, but we didn't have Diavik's responses by then. So these are included to show Diavik's responses. 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

DDMI-WMP-10: We recommend DDMI clarify their responses to DDMI-WMP-10 and GNWT-20-WMP-3 to clearly address EMAB's original recommendation and the apparent contradiction as to the applicability of the approach used in White and Gregovich (2017) to estimate a ZOI.

Also see Caribou Movement (DDMI-WMP-47).

The response is edited by EMAB to decrease the length. EMAB previously recommended the use of the selection ratio approach by White and Gregovich (2017) to DDMI. Golder, EMAB and MSES participated in a conference call in 2020 where the approach of White and Gregovich (2017) was reviewed. At this meeting, MSES agreed with DDMI that the selection ratio approach of White and Gregovich (2017) characterized a statistical interaction between distance and habitat quality. DDMI maintains that the application of habitat selection theory (Fretwell and Lucas 1970) should explain the reference caribou distribution in the absence of a ZOI. Comment DDMI-WMP-10 requested that that selection ratios within distance zones be used to monitoring a ZOI. The response by DDMI notes that there are other limitations to the selection ratio approach such as delineation of distance categories is subjectively determined and many distance categories increases model parameter cost using information theory model selection (Burnham and Anderson 2002). At the 2021 Mine Wildlife Monitoring Meetings (previously referred to as the SGP Wildlife Workshop) there was a presentation by Golder on the assumptions of ZOI analysis and in particular, the importance of demonstrating that the assumption about the spatial trend in habitat quality is valid and that it is easy to test. Boulanger et al. (2012, 2021) have not demonstrated that their assumption of an assumed uniform spatial trend in habitat quality is valid. Please refer to DDMI's response to DDMI-WMP-47 where DDMI provides additional evidence that the spatial trend of habitat quality is not uniformly distributed around the Ekati and Diavik mines (attached Figure 1). At the 2021 Mine Wildlife Monitoring Meetings ERM presented their study of the aerial survey data but using different methods than Golder (2020) and arrived at the same conclusion that caribou are distributed in accordance with quality habitat. ERM concluded that the existence of a ZOI was not supported. It is DDMI's view that two independent studies arriving at the same conclusion, using different methods and that demonstrate their assumptions are valid provides stronger evidence than two studies by the same investigators using the same method but have not tested and verified the assumptions in their model.

The GNWT hosts the mine monitoring meetings and has historically been responsible for production of a meeting report (e.g., Marshall 2009; Handley 2010). DDMI indicated that while it was suggested that caribou behaviour monitoring be discontinued, DDMI would engage EMAB and communities for input before deciding to discontinue this monitoring. It should be noted that the EER did not make predictions about caribou behaviour activities and that the predictions were an outcome of past wildlife monitoring meetings (Handley 2010). At this time DDMI intends to continue to collect caribou behaviour data (i.e., group scans) as done historically. DDMI believes the behaviour data are important for assessing a demographic effect linkage associated with a mine-related change in caribou behaviour and movement (i.e., a different scale of ZOI than Boulanger et al. 2021).
DDMI maintains that the application of habitat selection theory (Fretwell and Lucas 1970) and with respect to use of an interaction between a distance from mine and habitat variables is appropriate for testing a behavioural response by wolverine and is scientifically defensible. Please refer to responses to DDMI-WMP-54 and DDMI-WMP-55.
Please see response to DDMI-WMP-54 and DDMI-WMP-55
DDMI provided responses to EMAB's comments 17, 18 and 19 on for SW4 Closure Objective during the WLAWB review phase of the ICRP version 4.1.
Please refer to DDMI response to DDMI-WMP-47.
The comment is directed to ENR so no response by DDMI is required. Appendix D of the 2019 WMP report included a table of separate estimates (\pm 1 SE) of bedded, feeding, standing, alert, walking, trotting and running within and beyond 15 km as requested by EMAB. Estimates that with overlapping standard errors are considered to be statistically similar. Please refer to DDMI's response to DDMI-WMP-11.

DDMI-WMP-17: We recommend that DDMI re-evaluate these relationships through quantitative analysis of GPS collar data at the time of the next comprehensive analysis (2022). The analysis would verify that autumn range fidelity remains high and that the travel routes for the northern migration remain correlated with the location of the winter range (i.e., that the mine is having no measurable effect on the caribou migration). If changes in caribou range attributes are detected in future GPS collar data analysis that incorporates more recent data, this assumption regarding the extent of the energetic cost may need to be reconsidered.	DDMI previously committed to provide range attributes for Bathurst caribou in lieu of discontinued monitoring of caribou east-west deflections (Golder 2019a). As described in Golder (2019a) resulting changes in range attributes from mining activities would reflect cumulative effects from multiple overlapping developments and would not be solely attributable as an incremental effect from the Diavik Mine. As well, range contraction would result from reduction in caribou population size and in response to natural factors (Virgl et al. 2017). As such, any such analysis provided by DDMI would reflect a contribution (at DDMI's discretion) toward cumulative effects assessment and management. Cumulative effects assessment and management are a responsibility of the GNWT. EMAB's recommendation assumes that further contraction and northern shift of the autumn range would be attributable to Diavik Mine, which DDMI disagrees can be demonstrated or concluded. Figure 4.2-4 from Golder (2017) shows the decline of Bathurst caribou from 1986 to 2015, which corresponds with the contraction of and northern shift in the autumn range. Figure 4.2-4 is provided in this document as Figure 3. The results in Tables 3 and 4 of Boulanger et al. (2021) show variable annual detection of ZOIs depicting attraction, avoidance and no ZOI. These results are not consistent with patterns of contraction and northern shift in the autumn range of Bathurst caribou. Of note is the Jay Project analysis included a number of conservatisms to overestimate energetic effects and subsequent costs to fecundity as a precautionary approach. For example, the energetic model assumed caribou did not acclimatize to stressors, responded by running for 15 minutes and applied the same cost to animals regardless of their distance from the mine. A more technical precautionary assumption included that the variation around each of the model parameter estimates was not propagated through the results so that conclusions were only based on point-estimates. Had variation of mul
DDMI-WMP-44: Please clarify this difference in disturbance area reporting. The methods applied for this part of monitoring are adequate	Similar to the 2019 WMP report, natural areas occurring within the Diavik Mine footprint perimeter were again reclassified from disturbed to their original land cover type as they have not been altered by development. As described in the 2020 WMMR small areas of new disturbance were associated with the South Country Rock Pile expansion in 2020 but overall, the Mine's footprint remains smaller than predicted in the ERR.
DDMI-WMP-46: Can DDMI please clarify what is meant by 'annual but unmeasured factors' and discuss how 'unmeasured factors' were incorporated in their previous analysis of the aerial survey data.	A mixed model analysis was completed in the 2019 WMP report with a categorical year variable specified as a random factor. A categorical year variable is correlated with all factors that contribute to annual variation in caribou abundance. Measured temporal factors such as insect harassment and the Bathurst autumn range distribution were included in models as fixed effects. The variation of the categorical year variable reflects the cumulative variation of all other temporal factors that were not measured and explicitly modeled as fixed effects.

DDMI-WMP-47: We recommend DDMI integrate the findings of Boulanger et al. (2012; 2021), particularly regarding the analysis of collared caribou habitat selection, into the discussion of ZOI around the mine in the WMR. Further, based on the published analyses of caribou collar data, we recommend EMAB request GNWT and DDMI develop a ZOI mitigation and monitoring plan to be implemented immediately.

DDMI-WMP-48: In addition, based on the published analyses showing the presence of a ZOI around the mine, we recommend EMAB request DDMI, in collaboration with GNWT, immediately develop monitoring techniques to identify mine-related sources of sensory disturbance and new methods for monitoring caribou abundance and distribution relative to the mine whenever they are in the area. DDMI does not revise and re-issue annual reports. Instead DDMI will consider comments by EMAB for future reporting. Boulanger et al. (2012) completed a resource selection function (RSF) model based on collared caribou, which describes habitat selection. Habitat data used included water land cover and NDVI values. Boulanger et al. (2021) used this same RSF. The results of the RSF indicate that caribou avoid water land cover (i.e., lakes), which is also supported by the results of aerial surveys (<0.1% use relative to 30% availability of deep water land cover in the aerial survey study area [RSA]). The spatial trend in deep water land cover in the RSA exhibits a significant negative association with distance from mines (Spearman correlation, rho = -0.89, P <0.01), which was shown in Figure 12 of the 2019 WMP report. Consistent with the results of the 2019 WMP, the trend in lakes should result in a positive relationship with caribou abundance (or occurrence) in the absence of a ZOI effect. When examined further, the location of aerial survey segments that contain 100% water, shows a pattern of increasing frequency near the Mines (e.g., Lac de Gras) and from 10 km to 20 km north of the Mines (Exeter and Ursula lakes and Lac du Sauvage) (see attached Figure 1). Note that the UTM value ticks on the x-axes are equivalent to 20 km intervals. The distances of these lakes from mines are consistent with the threshold depicted by Boulanger et al. (2012) that estimated a ZOI at 14 km (95%CI: 12.0 to 15.5 km). Different annual ZOIs described by Boulanger et al. (2021) may reflect changes in where caribou were concentrated as they entered the RSA. While Boulanger et al. (2012, 2021) assumed their statistical threshold reflected a disturbance response by caribou, further examination shows that the process leading to this threshold can be explained by the trend and location of large lakes that caribou avoid.

The response is edited by EMAB to decrease the length. At the 2021 Mine Wildlife Monitoring Meetings there was a presentation by Golder on the assumptions of ZOI analysis and in particular, the importance of demonstrating that assumptions about the spatial trend in habitat quality are valid and that it is easy to test. Boulanger et al. (2012, 2021) have not demonstrated that their assumption of a uniform spatial trend in habitat quality is valid... It is DDMI's view that two independent studies arriving at the same conclusion and that demonstrate their assumptions are valid provides stronger evidence than two studies by the same investigators using the same method but have not demonstrated that their model assumptions are valid. While Boulanger et al. (2012, 2021) are peer-reviewed articles this does not mean that these studies are immune from scientific scrutiny. DDMI does monitor and has evaluated a number of mine activity covariates such as fugitive dust deposition (Golder 2019b; Watkinson et al. 2021), number of flights and blasts, waste rock hauled and full-time-equivalents (Golder 2017). To date none of these have demonstrated a significant relationship to wildlife monitoring data at Diavik (Golder 2011, 2014, 2017, 2020). Review of Tables 3 and 4 in Boulanger et al. (2021) show that avoidance of mines does not occur regularly in either collar (avoidance in 5 of 9 years and attraction or no ZOI in 2 years each) or aerial survey data (avoidance in 8 of 13 years and no ZOI in 5 years). Some of the years where ZOIs are measured, the ZOI magnitude overlaps zero (3 years each for collar data and aerial survey data), which indicates no measurable ecological effect. Collectively this means that a change has been measured in 4 of 9 years and 5 of 13 years in collar and aerial survey data, respectively. Furthermore, ZOIs were not detected during construction years. Mine construction is a time with high levels of human activity (greater labour force, more frequent blasting, big machinery, lights and noise are novel on the landscape), when little to no mitigation was occurring and habitat is actively and initially being removed. The magnitude of sensory and habitat disturbance is high during construction and a strong response by caribou would be expected but there was none. DDMI disagrees that there is strong evidence to support that caribou are responding to sensory disturbance by the Diavik and Ekati mines as there are many lines of evidence that show no response or a weak response by caribou.

DDMI-WMP-49: We support this type of forum as it could be a successful avenue to adaptively manage mine-related changes in caribou movement. We encourage Indigenous community participation in the forum, particularly those already involved in caribou monitoring programs. We support this forum and recommend that actionable items from meetings be developed whenever possible to ensure that relevant advancements in managing ZOI issues are implemented in Mine monitoring programs.	DDMI would participate in a such a follow-up meeting.
DDMI-WMP-50: We continue to emphasize the importance of these data in understanding the influence of the Mine on caribou and recommend that DDMI continue their efforts to collect caribou behaviour data annually and complete statistical analyses when data permits (also see Table 1, Reference #: DDMI-WMP-11).	These monitoring data are included in Diavik Mine's WMMP (Rio Tinto 2021). DDMI intends to continue caribou behaviour monitoring.
DDMI-WMP-53: We recommend EMAB review the meeting notes from the 2021 workshop, when made available by GNWT, before determining the appropriate frequency of future hair snagging surveys. We recommend EMAB confirm with GNWT the need for and preferred frequency of hair snagging surveys moving forward. We recommend developing triggers for reinstituting future annual hair snagging at an increased frequency (e.g., annually), for example, if the number of mortalities associated with the mine increases substantially, or if mortalities are recorded for 3 years in a row.	At the 2021 Mine Wildlife Monitoring Meetings program partners decided to discontinue the grizzly bear hair snagging program. Resuming this program requires agreement by all of the program partners as it cannot be implemented by one mine. DDMI would also like to note that Diavik's cost share to run this program was \$171,500 in 2012 and 2013 and \$217,300 in 2017. Grizzly bear mortalities and incidents will continue to be monitored and adaptively managed at the Diavik Mine.
DDMI-WMP-54: We recommend following the guidance of Efford and Boulanger (2018) who recommended repeating the hair snag surveys every four to six years to confirm regional wolverine populations remain stable.	At the 2021 Mine Wildlife Monitoring Meetings program partners decided to discontinue the wolverine hair snagging program. DDMI has shown previously that trends in occurrence from the wolverine snow track monitoring program correspond with trends in abundance from the hair snagging program (DDMI 2007; and attached Figure 2). Wolverine snow track monitoring is included in the WMMP and regularly involves community participation.
DDMI-WMP-55 : We recommend developing triggers for reinstituting future annual hair snagging surveys, for example, if the number of wolverine mortalities associated with the mine increases substantially, or if mortalities are recorded for 3 years in a row.	Hair snagging surveys for wolverine have never been part of the annual monitoring program but were completed in collaboration with ENR. DDMI has shown previously that trends in occurrence from the wolverine snow track monitoring program correspond with trends in abundance from the hair snagging program (DDMI 2007; attached Figure 2). Monitoring wolverine incidents and mortalities is included in the WMMP (Rio Tinto 2021). Efford and Boulanger (2018) showed that the wolverine population is approximately stable, which predicts that the population is resilient to natural mortality and the low frequency of mine-related mortality over the past decade.

GNWT-WMP-1: We recommend GNWT and DDMI develop a ZOI mitigation and monitoring plan to be implemented immediately.

GNWT-WMP-2: we recommend DDMI, in collaboration with GNWT, immediately develop monitoring techniques to identify mine-related sources of sensory disturbance and new methods for monitoring caribou abundance and distribution relative to the mine whenever they are in the area.

ENR is of the view that, given increased number of collars on barren-ground caribou herds, data from geofenced collars will suffice for meeting the monitoring objective "to determine whether ZOI changes in relation to mine activity" and is not requiring DDMI to resume aerial surveys as the primary data collection method for monitoring the ZOI at the site level. ENR agrees with EMAB's statement that "In order to develop and implement meaningful mitigation measures to try to address the ZOI issue, the focus must shift to gathering information on covariates of mine activity (i.e., traffic volumes, noise disturbance) that can be used in ZOI models to determine whether these are important mechanisms contributing to the ZOI." As DDMI did not provide a satisfactory level of detail in the WMMP about how they would carry out their ZOI analyses using GPS collar data, ENR included conditions on approval of the WMMP that require DDMI to submit a detailed description of their proposed ZOI analysis methods, including which metrics of mine activity levels will be included as covariates in the analyses and how they will be derived, at least six months prior to the submission of the comprehensive WMMP report in 2023. ENR will circulate the description of proposed ZOI analysis methods for a 30-day review period so that EMAB and other parties have an opportunity to provide feedback on the proposed methods before DDMI carries out their analyses. ENR has required that DDMI respond to reviewer comments and indicate how feedback will be incorporated into the comprehensive WMMP. ENR has also required that ZOI be estimated annually (but reported on in 2023, at the end of closure, and in post-closure) if the sample size of collar locations is sufficient, and that these analyses included covariates reflecting variation in the annual level of mine activity. Finally, ENR will require DMMI to contribute to future GNWT-coordinated efforts to undertake periodic aerial-based ZOI surveys, if deemed necessary.

ENR is of the view that, given increased number of collars on barren-ground caribou herds, data from geofenced collars will suffice for meeting the monitoring objective "to determine whether ZOI changes in relation to mine activity" and is not requiring DDMI to resume aerial surveys as the primary data collection method for monitoring the ZOI at the site level. ENR agrees with EMAB's statement that "In order to develop and implement meaningful mitigation measures to try to address the ZOI issue, the focus must shift to gathering information on covariates of mine activity (i.e., traffic volumes, noise disturbance) that can be used in ZOI models to determine whether these are important mechanisms contributing to the ZOI." As DDMI did not provide a satisfactory level of detail in the WMMP about how they would carry out their ZOI analyses using GPS collar data, ENR included conditions on approval of the WMMP that require DDMI to submit a detailed description of their proposed ZOI analysis methods, including which metrics of mine activity levels will be included as covariates in the analyses and how they will be derived, at least six months prior to the submission of the comprehensive WMMP report in 2023. ENR will circulate the description of proposed ZOI analysis methods for a 30-day review period so that EMAB and other parties have an opportunity to provide feedback on the proposed methods before DDMI carries out their analyses. ENR has required that DDMI respond to reviewer comments and indicate how feedback will be incorporated into the comprehensive WMMP. ENR has also required that ZOI be estimated annually (but reported on in 2023, at the end of closure, and in post-closure) if the sample size of collar locations is sufficient, and that these analyses included covariates reflecting variation in the annual level of mine activity. Finally, ENR will require DMMI to contribute to future GNWT-coordinated efforts to undertake periodic aerial-based ZOI surveys, if deemed necessary.

GNWT-WMP-3: EMAB recommends GNWT confirm the need for and preferred frequency of grizzly bear hair snagging surveys moving forward. EMAB also recommends developing triggers for reinstituting future annual grizzly bear hair snagging at an increased frequency.	ENR commits to developing regional triggers for industry-related bear and wolverine mortalities to inform the need to pursue reinstatement of any of these regional programs.
GNWT-WMP-4: EMAB recommends GNWT confirm the need for and preferred frequency of wolverine hair snagging surveys moving forward, taking into account Efford and Boulanger (2018). EMAB also recommends developing triggers for reinstituting future annual wolverine hair snagging at an increased frequency ENR should require Diavik to develop triggers for reinstating annual hair snagging surveys within Diavik's Wildlife Study Area. For example, if the number of mortalities associated with the mine increases substantially, or if mortalities are recorded three years in a row. EMAB recommends that ENR require Diavik to fulfill their commitment #33 from the MVEIRB Environmental Assessment, and to provide details on specific deterrent measures that will keep migratory birds and waterfowl, and other wildlife out of the pits during PK infilling, and prior to stabilization of water quality (commitments 14, 23, and 34).	ENR commits to developing regional triggers for industry-related bear and wolverine mortalities to inform the need to pursue reinstatement of any of these regional programs.

2021 Wildlife Monitoring Report

EMAB submitted 12 recommendations to Diavik on the 2021 WMR Report. Highlights can be found on pages 47-49. 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

Caribou Movement (DDMI - WMP-10): For reasons described below (DDMI-WMP-48), we concur with ENR that Golder 2020 is not a conclusive test of ZOIs around the Mine. We note that in the 2021 WMR, DDMI states they will continue ZOI monitoring using alternative methods and data presented by the ZOI Technical Task Group (GNWT-ZOITTG, 2015). It will be helpful to see annual estimates of the ZOI once DDMI begins analyzing the collar data as closure approaches and activity winds down at the site.

Diavik Response

ZOI monitoring and analyses are described by Diavik's Tier 3 Wildlife Management and Monitoring Plan (WWMP). DDMI intends to examine annual ZOI patterns following ZOI Technical Task Group guidelines (ZOITTG 2015) based on collared caribou data as part of the 2022 Wildlife Management and Monitoring Report. DDMI will prepare a Tier 2 WMMP that will address monitoring during the closure phase. Annual ZOI estimates from collared caribou data (2009 to 2017) for the Diavik-Ekati mine complex are available in Boulanger et al. (2021). The annual ZOI patterns vary from year-to-year and range from negative (attraction) to positive (avoidance) estimates. In four of nine years a ZOI of avoidance was not detected. The results of Boulanger et al. (2021) indicate that indirect habitat loss is not constant during mine operations as was assumed in the EER (DDMI 1998). The presence of negative ZOIs (attraction) also suggests there are occasional increases in the suitability of habitat adjacent to the mines

Vegetation and Wildlife Habitat (DDMI - WMP-14): We recommend removing this issue from the WMMR review process and addressing it through the ICRP process. Wildlife use of re-vegetated or reclaimed areas must be assessed using a scientifically defensible and repeatable method. All data collected needs to be standardized to ensure comparability between sites and years. Data on dust levels and vegetation abundance/composition should be collected at the same control and impact sites to evaluate factors influencing foraging rates.	DDMI agrees that the Diavik Mine Tier 3 WMMP designed for Mine operations cannot address Closure Objective SW4.
Caribou Distribution (DDMI - WMP-17): Can DDMI propose an alternative approach to monitoring change in caribou migration patterns that could be specifically linked to Diavik Mine activities? Using collar data, could seasonal migration travel routes be evaluated post-closure to evaluate whether the removal of human activity and infrastructure at the Diavik Mine site results in changes to migration travel routes from those observed during Mine operations? This information could potentially be used to information future development activities and impact predictions.	DDMI has used Bathurst caribou collar data (1996 to 2018) to assess east-west deflection of caribou movements (migration routes) during the northern and southern migration (Golder 2020a). The conclusion from long-term results is that the Diavik Mine has not had a strong influence on caribou northern or southern migration patterns during construction and operation, which has led to the discontinuation of this monitoring. DDMI has acknowledged that the use of East Island by migrating caribou during baseline has discontinued since Diavik Mine construction and during operation. Closure of Diavik Mine will not remove all human activity from the Lac de Gras region. The adjacent Ekati mine will continue to operate after Diavik mine is closed making it problematic to assign any change or lack of change in caribou migration routes explicitly to Diavik Mine. Spatial and temporal patterns of caribou distribution should reflect changes in travel routes by migrating caribou at coarse scales but not particular routes. It is possible to assess changes to migration routes at the level of individual collared caribou (e.g., Poole et al. 2021), which is different than population-level patterns and the scale of the EER (DDMI 1998) and effects monitoring (DDMI 2021) by Diavik Mine. An additional consideration for EMAB's proposed analysis would be the timing of the assessment during post-closure. Variation in seasonal range sizes and location over time demonstrate that caribou herd size influences the migration routes of individuals (Virgl et al. 2017; Golder 2020a). The Bathurst caribou herd began declining during baseline years (since mid-1980s [Virgl et al. 2017]) for Diavik Mine, with population cycles estimated to be 40 to 60 years (Zalatan et al. 2006). This type of influence would need to be addressed in order to strengthen inferences for the proposed comparison.

The response is edited by EMAB to decrease the length.
Disass refer to the response DDMI WMD 10 fer annual

Caribou Movement (DDMI-WMP-48): Considering all of the information available to us at this point in time, we recognize that a ZOI exists for caribou around the Diavik Diamond Mine and recommend all future efforts be focused on developing and implementing mitigation measures to counter this impact to caribou. We reiterate our recommendation: DDMI, in collaboration with GNWT, should immediately develop monitoring techniques to identify Mine-related sources of sensory disturbance and new methods for monitoring caribou abundance and distribution relative to the Mine whenever they are in the area.	analyses for the Diavik and Ekati mines (Boulanger et al. 2021a). To date only statistical effects have been demonstrated and that there is yet to be evidence of ecological effects or demographic consequence from mining. Ecological effects analysis was completed by Plante et al. (2020) who found no reduction in caribou survival related to interactions with industrial disturbances by the Leaf River and George River caribou herds. Similarly, Golder (2020b) showed that Lorillard collared caribou interacting with Meadowbank mine road ZOIs reached calving areas and showed similar parturition timing, calving rates and neonate mortality rates as reference caribou despite conclusions of statistical ZOI effects from the same collar data (Boulanger et al. 2020). The studies of Golder (2020) and ACDC (2020) identified available preferred and selected habitats based on results from use-availability (resource selection function [RSF]) analyses of collared caribou (e.g., Johnson et al. 2005; Boulanger et al. 2012). Preferred and selected habitats were then applied to the analysis of aerial survey data. Boulanger et al. (2012, 2021) also identified selected habitats from the same collared caribou data and applied the results of their RSF to the analysis of aerial survey data. The application of selected habitats for analysis of aerial survey data was the same for all studies. All four studies (Boulanger et al. 2012, 2021; ACDC 2020; Golder 2020) used the same aerial survey data so any location error is present in these studies and within the 1.2 km2 sampling unit. A more direct way to test whether selection of habitat(s) changed with proximity would have been to include an interaction term between distance and habitat variables in the RSF model.
Wolverine (DDMI-WMP-54): To have a clearer understanding of potential wolverine population trends, as inferred by snow track occurrence, we recommend producing a figure annually in the WMMR that is similar to the one provided by DDMI in its' response, in order for reviewers to easily note potential population trends by demonstrating the temporal trend in occurrence estimates. We recommend EMAB discuss regional wolverine population trends with ENR and what, if any triggers they have to undertake another round of regional DNA- based population surveys.	Correspondence concluded from Figure 2 (Golder 2021) was qualitatively assessed from similar temporal trends (measured in the same years) between snow track monitoring designs (IQ = Inuit Qaujimajatuqangit, SRS = simple random sampling) and hair-snagging results (DNA = hair snagging). Figure 2 included demarcation of values included in correspondence determination. The requested figure will be included in annual reports. Direct mine-related wolverine mortalities at Diavik continue to be infrequent (WSP Golder 2022), which is a key driver of population demography. Hair snagging is not necessary to determine presence. Snow track counts provide more than presence; the current design (two rounds) provides detection rate and relative abundance. DDMI will provide another copy of the DDMI (2007) to distribute to MSES.
Vegetation & Wildlife Habitat (DDMI-WMP-58): Please revise the text and table as necessary. In addition, please clarify what type of satellite imagery is used in this analysis as it provides an understanding of the data resolution used in the landscape analysis. Otherwise, the methods applied for this part of monitoring are adequate.	Thank you for identifying misspellings of "heath" in the 2021 WMMR. A SPOT satellite Image was used in Landscape Change analysis. The resolution of the imagery is 150 cm.

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Caribou Movement (DDMI-WMP-60): Following that, we recommend including annual estimates of the ZOI size in order for EMAB to monitor how it changes through Mine closure and reclamation on shorter time scales rather than waiting for the Comprehensive Wildlife Monitoring Reports every third year.	Please refer to response DDMI-WMP-10. As ZOI monitoring does not inform Diavik Mine operations, ZOI estimates will not be provided in annual reports but follow the schedule identified in the WMMP (DDMI 2021).
Caribou Behaviour (DDMI-WMP-62): We continue to emphasize the importance of these data in understanding the influence of the Mine on caribou and recommend that DDMI continue their efforts to collect caribou behaviour data annually and complete statistical analyses when data permits (also see Table 1, Reference #: DDMI-WMP-11).	These monitoring data are included in Diavik Mine's WMMP (Rio Tinto 2021). DDMI intends to continue caribou behaviour monitoring. This issue is satisfied. Please see DDMI-WMP-11 response.
Caribou Deterrence (DDMI-WMP-65): Active deterrence is not required every year; however, when it is reported, it would be helpful if the results included one statement placing them in historical context (e.g., When was the last time it was used? How frequently has it been deployed over the years?). Otherwise, the methods applied for this part of monitoring are adequate.	Historical context of active deterrence for caribou will be provided in the 2022 WMMR.
Caribou Adaptive Management (DDMI-WMP-66): Please discuss why behavioural scans are not included as part of the monitoring, even in cases when caribou are incidentally observed within 5 km of east island.	Section 4.3.2 of the 2021 WMMR indicates that group behaviour scans were completed on 21 caribou groups that were incidentally detected, ranging from 0 km to 15 km from Diavik Mine. In cases where caribou are incidentally detected beyond visibility from the Mine site (e.g., >2 km), group behaviour scans may be recorded if the staff present are familiar with group scan methods and it does not detract from achieving the objective of the off-site work. Beyond visibility from East Island, DDMI wants to avoid traveling to caribou groups to perform scans and potentially introduce caribou to stressors (e.g., snowmobiles). As noted previously to EMAB, winter represents a time with extreme cold temperatures and wind chill and limited daylight hours that increase human health and safety risks. DDMI will not complete this monitoring when it deems it is not safe to do so.
Raptors (DDMI-WMP-70): The methods applied for raptor monitoring are adequate, no further recommendations. However, we recommend developing a figure showing the number of Mine-related incidents and mortalities by year in each future monitoring report. This will allow for easy interpretation of mortality trends over time and should be easy to update each year.	A figure showing annual Mine-related raptor mortalities will be included in the 2022 WMMR
(DDMI-WMP-72): Can DDMI please discuss what, if any mitigation measures are being used to reduce levels of dust deposition? Can DDMI also please discuss if any non-native plant species have been found in any of the monitoring plots?	The Tier 3 WMMP for Diavik identifies several mitigations to reduce fugitive dust deposition. These include use of dust suppressants, low speed limits and a small footprint. Additionally, the use of underground mining techniques has reduced fugitive dust. Non-native plants were not observed at monitoring plots in 2021 and have not been observed previously.

TABLE OF **ACRONYMS**

Acronym	Definition
AEMP	Aquatic Effects Monitoring Program
AGM	Annual General Meeting
CAR	Comprehensive Analysis Report
CCME	Canadian Council of Ministers of the Environment
CES's	Critical Effects Sizes
CIRNAC	Crown-Indigenous Relations & Northern Affairs Canada
CSR	Comprehensive Study Report
DFO	Department of Fisheries and Oceans
EAAR	Environmental Agreement Annual Report
EAQMP	Environmental Air Quality Monitoring Program
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
EMAB	Environmental Monitoring Advisory Board
ENR	Environment and Natural Resources
EPA	Environmental Protection Act
EQC	Effluent Quality Criteria
FCRP	Final Closure and Reclamation Plan
FF	Far-Field
GHGRP	Greenhouse Gas Reporting Program
GNWT	Government of the Northwest Territories
ICRP	Interim Closure and Reclamation Plan
KIA	Kitikmeot Inuit Association
LdG	Lac de Gras
LKDFN	Lutselk'e Dene First Nation
MDMER	Metal and Diamond Mining Effluent Regulations
MVEIRB	Mackenzie Valley Environmental Impact Review Board
MVLWB	Mackenzie Valley Land and Water Board
NCRP	North Country Rock Pile (aka WRSA – see below)
NI	North Inlet





TABLE OF **ACRONYMS**

Acronym	Definition
NF	Near Field
NPRI	National Pollutant Release Inventory
NSC	North South Consultants
NSMA	North Slave Metis Alliance
NWRSA	North Waste Rock Storage Area (aka NCRP or WRSA)
PHC	Petroleum Hydrocarbons
РК	Processed Kimberlite
РКС	Processed Kimberlite Containment Facility
PKMW	PK to Mine Workings
QAPP	Quality Assurance Project Plan
RER	Re-evaluation Report
SEC	Slater Environmental Consulting
SGP	Slave Geological Province
SNP	Surveillance Network Program
SOI	Substance of Interest
SWRSA	South Waste Rock Storage Area
TG	Tłjcho Government
TK/IQ	Traditional Knowledge / Inuit Qaujimajatuqangit
TSP	Total Suspended Particulates
TTG	Technical Task Group
WTA	Waste Transfer Area
WLWB	Wek'èezhìı Land and Water Board
WMMP	Wildlife Management and Monitoring Program
WMP	Wildlife Monitoring Program
WMR	Wildlife Monitoring Report
WMMR	Wildlife Management and Monitoring Report
WRRB	Wek'èezhiı Renewable Resources Board
YKDFN	Yellowknives Dene First Nation
ZOI	Zone of Influence

Working with the People for the Environment

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