



## PLAIN LANGUAGE ANNUAL REPORT 2012-13 A PUBLIC WATCHDOG FOR ENVIRONMENTAL MANAGEMENT AT EKATI DIAMOND MINE<sup>TM</sup>

ENVIRONMENTAL MONITORING AGENCY



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**Glossary** (A listing of all *italicized* words used in this report except the names of laws, policies and publications.)



Whatì, September 2012. L - R: Bill Ross and Isadore Zoe.

**O** n April 10, 2013, Dominion Diamond Ekati Corporation (DDEC) took over the Ekati Diamond Mine. The sale started months earlier. The *Environmental Agreement* will stay in place with DDEC. The same people who worked for BHPB's Environment department are working for DDEC, and so I expect our good working relationship will continue.

I am glad to report that BHP Billiton (BHPB) is still doing a good job of environmental protection at the mine. Our working relationship with staff at Ekati has also been very good. We do not agree on everything, but we work respectfully toward good environmental management. Major developments last year have been:

- Renewal of the water licence

   a good process;
- 2012 Environmental Impact Report – much improved; and
- The company's first progress report on the Interim Closure and Reclamation Plan (ICRP)
   has some weak points

We stress in this report how important it is that all of the monitoring works together for better management. This includes monitoring of air, wildlife and water. For example, dust is a possible reason

# MESSAGE FROM THE CHAIR 2013

that caribou avoid the mine. Air quality monitoring could give us a better understanding of dust. This could be used to reduce dust, which could help the caribou. The results of this work could show us that caribou avoid the mine less if there is less dust.

Last year, I was hopeful about the process to decide the financial security (the money set aside to properly close the mine) needed when the mine closes. I am sad to report that the process stalled. An amount has now been proposed (\$224 million). Despite this, the Agency is not able to assure our Society Members that the public will be protected from having to pay to reclaim when the mine is closed.

The Agency has continued work with our communications plan:

- We have information available in many Aboriginal languages, French and English.
- We send out summaries of our activities to interested people.
- Our website is greatly improved.

At the beginning of this year, Allison Anderson left as our Communications and Environmental Specialist. She has been replaced by Jessica Simpson, whom we welcome. We also had a change in the director appointed by the North Slave Métis Alliance. Sheryl Grieve was replaced by Arnold Enge. We thank Sheryl and Allison for their work.

In the coming year, we will watch the change from BHP Billiton to Dominion Diamond Ekati Corporation. We will continue to insist that Ekati Mine is operated in a way that protects the environment, as it has been for the last 16 years.

As always, we welcome your input. We will try to answer any questions or concerns. ■

1. Rad

William A. Ross, Chairperson March 31, 2013

# **MINING AT EKATI**

BHP Billiton (BHPB) is mining diamonds using large open pits and underground tunnels to remove the kimberlite rock that contains the diamonds.



#### Long Lake Containment Facility

The Long Lake Containment Facility (tailings pond) holds the crushed wet kimberlite that remains after diamonds are removed. It is a lake divided into five sections (cells A to E) by dykes (rock walls) so the processed kimberlite can settle. Water is eventually released into lakes downstream when it is clean and pollutants are below the amounts set in the water licence.





**Main Camp** This area includes

an accommodation building for hundreds of workers, a power plant, a truck shop and a processing plant where the diamonds are removed from the kimberlite.





Rock that does not contain diamonds is piled in layers up to 50 metres high.





Incinerator The building where garbage is taken to be burned.



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#### **Beartooth Pit**

BHPB has finished mining Beartooth Pit. The company currently stores water from underground mining in the pit. In late 2012, BHPB will start to store *processed kimberlite* in the pit.

### Panda and Koala Pits

Open pit mining has finished here. Underground mining is finished at Panda, but is still happening at Koala. BHPB has built an underground tunnel (located between Panda and Koala pits) to provide access to the bottoms of the pits. A conveyor belt system takes the *kimberlite* rock to the processing plant.



### Panda Diversion Channel and Pigeon Stream Diversion

The Panda Diversion Channel and Pigeon Stream Diversion (proposed) are man - made streams diverting water that would otherwise flow into the pits. Fish, mostly grayling, use the new channels for travel and spawning. The Pigeon Stream Diversion will be opened in 2013.

#### **Haul Roads**

BHPB has built all-weather roads to connect the pits to the main camp. BHPB carefully applies chemicals to reduce dust on the roads to try to make sure that chemicals do not seep into the lakes and streams near the roads.



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#### Fox Pit

This is the biggest pit at Ekati and most diamonds are found in here.





#### **Misery Pit**

BHPB stopped mining at Misery Pit in 2005. The company has begun work to push back the walls and mine deeper in the pit.



Meeting in Agency boardroom.

## **HIGHLIGHTS**

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Four board meetings, the annual general meeting and an open house in Whatì.

More improvements in our communications and website.

Taking part in water licence renewal, 2012 Environmental Impact Report and financial security reviews.

#### Site visits to Ekati Mine.

# HOW WE DO OUR WORK

## Activities 2012-13

This year, the Agency held four board meetings in Yellowknife. We also had our annual general meeting (AGM) and an open house in December 2012. At our AGM we talked about water quality downstream in the Coppermine River, the ability of Aboriginal Affairs and Northern Development Canada to inspect the mine, jobs for Aboriginal youth, and the possible change in mine owners.

We made two visits to Ekati Mine this year. We visited in April 2012 to see the widening of the Panda Diversion Channel and the Pigeon Stream Diversion. We also toured the mine and met with staff in June 2012.

# Technical Reviews and Input

All year, the Agency took part in reviews of regulatory and environmental reports, plans and studies done by the company.

We focused on two major things this year: the water licence renewal and 2012 Environmental Impact Report. We met with BHPB in June 2011 to tell them early about our concerns with the water licence renewal. BHPB's water licence application had much new and helpful information. We took an active part in the Wek'èezhi Land and Water Board's technical sessions for the water licence renewal in October 2012. Our opinion on the water licence application was filed in December 2012. We presented at the public hearing in February 2013. Final arguments were made later in the month. We also reviewed the draft water licence in April 2013. We look forward to the final results.

We were pleased that BHPB took our advice and began early talks on the findings of the 2012 Environmental Impact Report (EIR). An EIR is done every 3 years to look at the longerterm impacts and how the company is doing at managing its changes to the environment. The company also shifted its focus toward lasting effects and how to deal with them. We attended good EIR meetings in July and November 2012. We then recommended that the EIR be accepted by the federal and territorial ministers. We look forward to the

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### **New Agency Communications Tools**

The Agency's Communications Plan was completed in October 2011. It gives the main things we need to say and who should hear them. The plan tells the aim of our communications and ways that we will communicate. It also has ways to measure success. In 2012-13, we made:

- Two issues of our newsletter, the 'Ekati Monitor', in April and November 2012 with a bigger distribution list.
- Brochures about the Agency in six languages – Chipewyan, Tłįchǫ, Weledeh, Inuinnaqtun, French and English.
- An updated poster about the Agency in the six languages.
- Improvements to our website, including the Ekati Mine history (timeline).
- A summary brochure after our visit to Whatì in September 2012.

We also hired a new Communications and Environmental Specialist – Jessica Simpson. She started work in April 2013. In 2013-14, we will be working on more communications:

- Write and send out our 2012-13 annual report in technical, plain language and summary.
- Index and reorganize our public registry and resource library. This includes our large photo collection.

- More changes to our website.
  - Community visits.
  - Hold an Environmental Workshop along with our annual general meeting, likely in December 2013.
  - Possibly use social media (Facebook and Twitter) by the Agency.
  - Changes to our website and communications products to show the change in ownership of the Ekati Mine.
  - A display about the Agency for use in schools and trade shows.
  - A video about the Agency in the Aboriginal languages, French and English. It would be posted to our website and available on CD or DVD.

For more details on our 'Communications Plan', please visit our website at www.monitoringagency.net.



Whatì community government office.

final report from the company.

In July 2012, at our suggestion, BHPB held a meeting to talk about future monitoring of fish habitat in the Panda Diversion Channel. Also, a target for the permitted amount of *nitrate* in water coming from Long Lake Containment Facility was discussed in September 2012. The company wanted to drain a backlog of water using this higher *nitrate* level. In December 2012, we went to a workshop to discuss the review of the Aquatic Effects Monitoring Program. For wildlife, we took part in GNWT Environment and Natural Resources workshops held in March 2013. We looked at goals and standards for wildlife monitoring. We also talked about use of data from carnivore and caribou monitoring. Much work must still be done.

#### Agency Communications and Joint Work

The Agency did not host an environment workshop in 2012-13. The company carried out the EIR and held two helpful workshops. We were pleased with these efforts.



Site visit in June 2012.

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Agency annual general meeting, December 2012.

Working together was most helpful for a much improved EIR.

We were very pleased with the help we got from the Community Government staff in Whati in planning and hosting our Board meeting in their community. At the open house, questions were asked about mine impacts on caribou and water. We were able to answer most questions. We followed up with a brochure sent to the community. We also sent a letter about community concerns to the company and governments. Read more about our communications on page 5.

The Agency and the signers of the *Environmental Agreement* (BHPB, GNWT and Canada) hold meetings twice a year. This time they were in June 2012 and February 2013. The meetings help us work and communicate together. Then we can give updates on our activities. We also report on

expenses and future plans. It also gives the others an opportunity to respond to our recommendations made in the last annual report.

In March 2013, a meeting was held by the Inter-Agency Coordinating Team (IACT). IACT includes the Agency and a group of government regulators. This meeting helped us understand the process for the change of mine ownership.

# Assessing the Agency

The Agency has made progress on our Communications Plan. We have several new tools that help us explain our role to the public.

We were happy with the good feedback from our Society Members at the annual general meeting. We think there may be chances for us to use the skills and enthusiasm of community youth. We will be looking at the use of social media, too.

The Agency held a good open house in Whatì. We have now visited all of the directly affected communities at least once. We look forward to more community visits. We were pleased that many of our recommendations on the water licence renewal were adopted by the WLWB. This is especially true for regulating *nitrate* and chloride. We have always pushed for a complete review of the costs to restore the mine site. The public needs to know there is enough financial security to cover the full *closure* plan. We are concerned that *reclamation* research is slipping. Chances for an early start to *reclamation* (cleaning up and returning the mine to nature) have not been realized.

The Agency has also spoken strongly for better wildlife monitoring programs. The aim should be to reduce the influence on caribou and to better test the program results. We will continue to pursue these matters. ■



Back row, Left to Right: Jessica Simpson, Arnold Enge, Bill Ross, Tony Pearse, and Kim Poole. Front Row, Left to Right: Laura Johnston, Kevin O'Reilly, Jaida Ohokannoak, and Tim Byers.



Agency open house in Whati, September 2012.



Processed kimberlite deposition into Long Lake.

## **HIGHLIGHTS**

Processed kimberlite tailings are now being put into Beartooth Pit.

#### Some waste rock piles not freezing as planned.

Follow-up work needed on oil and grease residue in coarse kimberlite rejects and cause of some waste rock piles remaining unfrozen.

# WASTE ROCK AND PROCESSED KIMBERLITE MANAGEMENT

## Activities 2012-13

Mining in 2012 continued at Koala North, Koala Underground, and Fox pipes. Mining started again at the Misery Pit in 2012, after 7 years of inactivity. Fourfifths (82%) of *kimberlite* processed in 2012 came from the Fox Pit.

The Wek'èezhii Land and Water Board (WLWB) approved revised management plans for both *waste rock* and operating the Long Lake Containment Facility (LLCF).

The latest version of the company's Wastewater and Processed Kimberlite Management Plan (WPKMP) now includes the Beartooth Pit. It will be used for *tailings* disposal. The plan also allows for disposal in new areas of LLCF cells A and C. Roads have been built around the far sides of the two cells. These will allow more *kimberlite tailings* to be deposited there. By this move, it is possible that disposal of *tailings* in cell D can be avoided. *Tailings* discharge to the LLCF totaled 5.8 million m<sup>3</sup>. This is a slight rise from last year's total.

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Seepage sampling of *waste rock* and waste kimberlite piles was done in spring and fall 2012. There was more sampling at Misery because mining operations have started again. There was less sampling at Fox since no mining of *waste rock* was done there during 2012. The results were about the same as other years. Some seeps show slightly higher levels of ammonia. This shows blasting residues are still coming from the *waste rock*. Other sites had less ammonia. A few seeps in the northeast section of the Panda/Koala *Waste Rock* Storage Area show more sulphate, calcium, and magnesium. This is likely a result of *kimberlite* reacting directly with tundra water.

Samples from Fox also showed *kimberlite* breaking down. Sampling at Fox during spring melt showed that the total suspended solids (TSS

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which are very fine particles that float around) and aluminum (Al) were a little higher than they should be.

The larger pieces of waste *kimberlite*, called coarse *kimberlite* rejects, also show higher levels of sulphate, calcium, magnesium, sodium, and *molybdenum*. This shows the *kimberlite* is breaking down. There were high rates of flow at two seeps, despite low rainfall in 2012. Maybe the waste *kimberlite* is adding chemicals to the LLCF.

Sampling at the waste *kimberlite* pile also showed some toluene, styrene and benzene (usually used as cleaners), and *hydrocarbons* (petroleum product). *Hydrocarbons* were also detected in 2010 and have been increasing since that time.

As in past years, temperatures inside the *waste rock* and ore piles were recorded by a consultant for the company called EBA Engineering Consultants (EBA). Trends from past years continued in 2012. The waste *kimberlite* pile remains unfrozen. The Koala-Panda-Beartooth *waste rock* pile has a frozen core. Large parts of the Fox *waste rock* pile remain unfrozen. The temperatures go up to 5.6°C. The lack of freezing may come from placing warmer rock on the pile or from dumping in above-freezing temperatures. The consultant EBA



Processed kimberlite spill recovery, June 2012.

does note that chemical reactions within the pile may also be a cause.

The '2012 Annual Seepage Report' recommends that *kimberlite* waste should be watched carefully for acid as that shows that metals from the rock are being dissolved and getting into the water downstream. This waste is affecting waters draining into Cujo Lake and Desperation Pond. The report notes that disposal of *kimberlite* and schist (clay and mud turned into rock under great pressure and often having mica or shiny specks) together has previously caused significant deterioration in water quality at Misery.

The picture emerging at Ekati is that there is metal dissolving out of the *waste rock* piles without much acid being present. It will continue because of weathering of *waste rock*. The company expects that long-term drainage from the *waste rock* piles will show minor increases in some metals. Seepage is not expected to be more than the water licence allows. Sulphate should eventually decline. After mining stops, ammonia will decline as blasting residues decompose.

## **Agency Comments**

No big issues with *waste rock* management or drainage from the *waste rock* piles emerged in 2012. Water quality standards are usually being met. The trend for regulated *contaminants* is stabilized or decreasing. Other *contaminants* not regulated in the water licence are increasing and may become a concern at *closure*.

We support the recommendations in the '2012 Annual Seepage Report':

- To follow up on the causes of *hydrocarbons* in the seepage from waste *kimberlite* piles; and
- To find how much and how quickly *kimberlite* is breaking down and what changes it will cause.

The lack of freezing of the Fox *waste rock* pile is a concern that we have noted in previous years. The company's plans for controlling the quality of water draining relies largely on the inside of the piles being frozen. This is happening for most rock piles, but not the Fox *waste rock* pile. EBA, the company's consultant's report does not explain why this happens only at the Fox *waste rock* pile and in some of the waste *kimberlite* areas.

We suggested before that more work is needed to explain the trends. Some thinking is needed to develop an approach to the problem in case there are more or future issues.

In 2011 and 2012, the company's consultant EBA recommended that surface rock around where the temperatures of the rock are being measured, be properly recorded to find how much rock has been removed for use in other places at the mine. This work was apparently not done by BHPB.

Some of the ground temperature devices have become lost, buried or broken over the years. This means less and less data is being collected. The approved *reclamation* research program, however, required the more temperature devices be installed into the *waste rock* piles. (More information is provided in the Closure and Reclamation section.)



Widening of the Panda Diversion Channel, June 2012.

### HIGHLIGHTS

Company submitted its first annual progress report on carrying out the approved closure plan.

Panda Diversion Channel widening and Old Camp reclamation delayed without a known start date.

Updated financial security estimate of \$224 million submitted by BHPB.

# **CLOSURE PLANNING**

## Activities 2012-13

The Interim Closure and Reclamation Plan (ICRP) was approved in November 2011 by the Wek'èezhìi Land and Water Board (WLWB). BHPB was told to update the estimate for mine *closure* costs. The new numbers were submitted in March 2013.

The other main event in 2012 was the company submitted its first progress report on *reclamation* research. This is required by the WLWB.

## **Security Estimate**

The amount of *closure* security for the Ekati Mine currently held by the Aboriginal Affairs and Northern Development Canada (AANDC) is \$126.8 million. This security is held as 'irrevocable letters of credit' (ILOCs), which are letters from banks that can be cashed in by the federal government to carry out the work if the company cannot or does not do it themselves. This money is split between the Class A Water Licence, the *Environmental Agreement*, and the Land Use Permit. The amounts are based on figures provided by AANDC. The amount of the security over time is shown in Figure 1.

On December 6, 2011, the WLWB asked for a new security estimate. The first deadline (January 31, 2012) was changed to November 16, 2012.

There were further delays while sorting out what should be included. Finally on March 4, 2013, the WLWB formally asked BHPB for the new security estimate. It should include all the costs of completing the *closure* activities in the ICRP.

At the end of March 2013, BHPB sent in its new reclamation security estimate of \$224,790,094.

### **Agency Comments**

The last time a detailed review was done on the financial security for Ekati was in 2004. The company submitted an estimate but it was not accepted. We were not happy with the financial security review process in 2012-13. Because the company took

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#### Figure 1: Ekati Diamond Mine Financial Security

Notes: The company estimates are based on the Annual Reports for 1999-2012. No estimate was provided in 2012. The 2013 figure is from the BHPB estimate provided to the WLWB on March 22, 2013. Security held by AANDC is based on the *Environmental Agreement* and relevant water licences covering the main site and Sable, Pigeon and Beartooth areas. Financial security held by AANDC is likely to increase in 2013.

Below: Fox Pit.



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a long time to submit its estimate, we had less time to study the new estimate. There was also less time for the interested parties to discuss the estimate. There was no time to talk together about the split of the financial security between the water licence and the *Environmental Agreement*.

We have now looked over the '2013 Reclamation Security Estimate'. At the time of writing, we had just received the AANDC review of the estimate.

The Agency does not have enough information to judge the split of financial security. We can do better after AANDC reports on its review.

We find that BHPB made good use of RECLAIM (a computer model used to estimate how much it would cost to reclaim a mine site to a natural state) to make its estimate. It was not hard to follow the thread from the ICRP to the cost estimates. The activities and ideas about operations and costs seem reasonable.

Our main concerns are:

- How were rising costs over time calculated?
- How were costs for *reclamation* research estimated?

### **RECOMMENDATION 1**

The WLWB should issue a directive to the company to conduct and complete reclamation and closure of Phase 1 tailings pond and Old Camp in accordance with a prescribed deadline determined by the WLWB.

• Where are the costs to prepare a final Closure and Reclamation Plan and other items after *closure*?

The review process for the company's estimated *reclamation* costs is continuing. Right now, we cannot tell our Society Members that there will be no public cost when the mine is closed.

### Progressive Reclamation

Since the 1997 Class A water licence was issued, the company is required to try to reclaim mining areas as soon as is it can. Unfortunately, there has not been much success on this goal so far:

- The Phase 1 *tailings* pond and Old Camp area has not been reclaimed, as promised. The company's reason was "business decisions." This is not a good reason for delay.
- The Panda Diversion Channel widening project was not complete in

2012-13 as promised. The company's reason was "business decisions." This is not a good reason for delay.

## **Agency Comments**

The *reclamation* work has slipped for years now. The ICRP Annual Report did not give any new dates for finishing it. Therefore, we asked in February 2013 that the WLWB set a deadline for a plan to start this work. We also asked that, after approval by the WLWB, the *reclamation* work should be done right away. So far we have not had any reply.

In our review, we also found that required *reclamation* research is not on schedule. Many projects are falling behind by one or more years.

The end of mining is expected by 2019. We are concerned that vital information from the research program will not be ready in time. Both the company and the WLWB need to make sure research projects are on time. ■

# 2013 Reclamation Security Estimate

The goal of the 2013 Security Estimate is to give a good idea for the cost of mine *closure*. It has to include reclaiming the site and meeting rules and policies. The estimate also gives a single cost model for each work item. It includes all costs such as:

- Engineering designs;
- Reclamation actions;
- Support actions and infrastructure;
- Environmental monitoring;
- Reporting; and
- Unexpected extras.

### Progress on Reclamation Research

The new ICRP includes things like flooding the open pits and covering the LLCF with plants and rocks. Most important, and as a result of the Agency's comments in the planning process, the new plan allows fish to use the final pit lakes. It also requires the company to do a lot more research to get the information necessary to close the mine properly. A progress report on the

research is needed once a year.

![](_page_13_Picture_0.jpeg)

![](_page_13_Picture_1.jpeg)

Pigeon Stream.

## HIGHLIGHTS

Results of three-year AEMP review will be put into practice in 2013.

Some contaminants continue to increase downstream of the mine.

Plankton changes in lakes downstream of the mine.

Strong ties between metals in lake mud and in fish.

Panda Diversion Channel (PDC) work on final habitat construction is almost done.

# **FISH AND WATER**

ach year BHP Billiton (BHPB) checks if the water downstream from its mine is changing. Water from the mine is released into two watersheds which are tested. Places away from the mine are also tested for water quality changes. The Aquatic Effects Monitoring Program (AEMP) measures any changes downstream. This includes water, bottom mud, microscopic plants, bugs and fish. Two special studies were also done.

## Activities 2012-13

*Tailings*, treated sewage and pit water were pumped into the Long Lake Containment Facility (LLCF). Water was released from the LLCF from June to December 2012. Mine water was also pumped into Beartooth Pit.

Wastewater also came out of the Misery site. Water from the *Waste Rock* Dam was sent into King Pond Settling Facility (KPSF) in August 2012. No water was pumped from Misery Pit in 2012. In June and July, water was released from the KPSF to Cujo Lake which eventually drains into Lac du Sauvage.

## 2012 Aquatic Effects Monitoring Program (AEMP) Plan

Every 3 years, BHPB has to take a new look at the Aquatic Effects Monitoring Program (AEMP). There were 33 improvements the company recommended. We took part in a technical workshop to talk about the changes. We have no major concerns with the current program or the proposed changes.

#### Changes to the 2012 AEMP

A new work plan for 2012 fish monitoring was approved by the Wek'èezhi Land and Water Board. These are the changes:

- Slimy sculpin added to the fish being sampled. These small fish will be monitored every 3 years starting with the 2012 program.
- For lake trout, muscle tissue samples were taken without having to kill the fish to check for metals.

- Round whitefish and slimy sculpin were tested for exposure to *hvdrocarbons*.
- Organochlorine chemicals (*PCBs, dioxins and furans*) were measured for the first time, but only in whitefish.

#### AEMP Monitoring Results Water Quality Sampling and Results

Each year BHPB reports the results of its work and gives the highlights in its annual report.

The Koala-Lac de Gras system has been checked for 15 years and King-Cujo for 12.

Under-ice temperature seems to be cooler in all lakes downstream of the LLCF as far as Nema Lake. We don't know why. Warming was seen in Kodiak Lake along with a change in oxygen in the water. These changes began in 2007 when aerators, machines used to add oxygen, were no longer used. Grizzly Lake is showing some layers of different temperatures. The cause is not clear. There will be more testing done in 2013.

During open water, iron amounts increase farther downstream from the LLCF. This could be tied to the rising amounts of *nitrate* in LLCF waters.

*Molybdenum* levels downstream are lower than last year, but are still higher than they should be, especially under ice. The levels did stay below the goal set by the company. The levels in the Cujo Lake outflow were higher than any previous year. These levels are of concern as *molybdenum* can affect trout just after they hatch. Other changes include:

- Potassium amounts have reached the company's limit;
- Selenium remains at pre-2007 levels after the spike that occurred in 2010;
- Copper amounts in the PDC and Kodiak Lake continued to rise a bit. They are still at or above the guideline.
- Arsenic levels were high under ice in Leslie and Moose lakes but not yet to the point of being a health hazard; and
- Total organic carbon (TOC) amounts are high in Cujo Lake, Cujo Outflow and Christine-Lac du Sauvage. Amounts get lower downstream from the KPSF.

#### Animal and Plant Sampling and Results

**Plankton:** Plankton (tiny water plants and bugs) seems to be changed by the mine both downstream of the LLCF and of the Misery operations. There are fewer kinds of plankton now in Leslie Lake. Leslie also now has more green algae than other lakes. LLCF discharges may be responsible. Most of the green algae in Leslie are not edible for the bugs that fish eat, so this change in plant plankton could affect fish food in years to come.

In Cujo Lake, there are not so many tiny plants as there used to be in 2003. There aren't as many water fleas in Moose and Nema lakes too. These changes in the plankton may be important for fish health as certain fish like whitefish seem to prefer to eat water fleas.

**Fish:** Trout growth rate and fitness seem to be less in all lakes downstream of the LLCF. So far, this is not true of whitefish.

**Selenium:** Amounts of selenium in trout and whitefish muscle have been increasing to levels above guideline amounts. This is likely caused by the mine. What does this mean for the health of the fish populations? What can be done to reduce the selenium? The information is not found in the AEMP report. We think that DDEC will need to do more work to answer these questions.

**EROD:** The enzyme (chemicals that control processes such as growth and reproduction in animals) Ethoxyresofurin-O-Deethylase (EROD) in fish shows exposure to either *hydrocarbons* or organochlorines. There were signs of this in slimy sculpin and whitefish. The company says there may be a link between mining at Ekati and hydrocarbon releases into the environment but the source is unknown.

**Dioxins and Furans:** Three whitefish in each of six lakes were sampled for *PCBs, dioxins and furans.* Yet only one fish was sampled from Kodiak Lake. A previous study showed Kodiak mud had these chemicals in it. No sculpins were tested.

In all lakes *PCBs* were not detected in fish. Results were not certain for *dioxins and furans*. These were found in whitefish only in two lakes downstream of the LLCF. We believe that *dioxins and furans* need more study in lakes near the mine.

**DELT:** Both trout and whitefish were seen by Aboriginal fishers for deformities, eroded fins, lesions and tumours (DELT). The fish looked to be in good health. Tumours were seen less than in 2007 (except in Cujo Lake trout). In some lakes downstream of the mine, sores and bad eyes were found on fish more in 2012 than in 2007. But this was also true in lakes untouched by the mine. Lots of eroded fins were seen in both whitefish and trout.

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**Parasites:** Some parasites were found in fish downstream from the LLCF. The highest infection rates are in lakes closest to the mine.

# Special Studies and Monitoring Program

In 2012, two special studies were done:

- Endocrine-Disrupting Compounds (EDCs)
- 2012 Panda Diversion Channel Habitat Enhancements

#### **Endocrine-Disrupting Compounds:**

EDCs can cause problems for fish reproduction and are found in personal care products, some drugs and cleaners. BHPB checked this for the first time. Amounts in Ekati sewage were lower than lab machines can even detect. These results are good.

Panda Diversion Channel Habitat Enhancements: During the summer of 2012, a search was done to find the best places for vegetation mats and rocks in the Panda Diversion Channel (PDC). Mats of eelgrass taken from Pigeon Stream were placed in the PDC during the summer. Rocky ramps were placed during winter so as to not bother the fish.

More work is to be done on the

PDC channel after the widening is finished. Lessons learned from the 15 years of PDC monitoring will be used for the Pigeon Stream Diversion.

## **Agency Comments**

Our review of the 2012 reports shows that the company is generally doing a good job of protecting the water at the mine site. There are still a few challenges. The AEMP has the scope to find small changes downstream of the mine. This can alert managers to any new problems before they start to harm the lakes and streams. We still have concerns with some metals increasing downstream from the mine.

The three-year review of the AEMP made a good program stronger. Our recommendations were used by both the WLWB and BHPB. We urge the company to do more to find out how far up the food chain changes are occurring because of water pollution from the mine.

Plant and animal sampling was done in the summer of 2012. Plankton seems to be affected by the mine. This may be bad for fish health but more study is needed. Trout growth and fitness seem to have decreased over time. The element of most concern is selenium. Concentrations in lake trout and round whitefish muscle have increased and are above guidelines. More study is needed about possible ways to reduce this pollutant. None was found in the current AEMP. Exposure to *hydrocarbons* or organochlorines (*PCBs, dioxins and* 

*furans*) as higher closer to the LLCF. *PCBs* were below detection in all lakes, but results for *dioxins and furans* were inconclusive. We were disappointed that the company did not test sculpins to see if there are

![](_page_15_Picture_17.jpeg)

![](_page_15_Picture_18.jpeg)

Panda Diversion Channel, before and after the widening of the west side.

### **Ekati Water Licence Renewal**

The Wek'èezhìi Land and Water Board (WLWB) regulates how land and water is used and how deposit of waste into waters is managed. The WLWB does this by issuing water licences or land use permits that have terms and conditions attached so companies can operate mines or other resource development.

Ekati's first water licence was issued in 1997 and has been renewed a few times since. The latest renewal process started in June 2011. Staff from the company met with the Agency to talk about what the new water licence should look like and to hear any concerns the Agency had.

In April 2012, BHPB put in an application to the WLWB for a new water licence. The company did a lot of work to look at what *contaminants* should be regulated in the licence and what the upper limits should be for those *contaminants*. There was a lot of supporting documents that the company submitted. Some of the changes that BHPB asked for included:

- To have fewer pollutants that need to be monitored and regulated;
- To change the location of some monitoring stations; and
- To include a new plan for what would happen when pollution levels reach certain limits.

The Agency thought that there were some issues with some of these

changes. On October 23-24, 2012, the WLWB held a technical meeting where these problems were talked about with the company and other parties. Many of the problems were resolved at that time and it was also identified that there was still some information needed to make a sound decision on what requirements should be in the water licence. The Agency made 26 recommendations to the WLWB, including setting new licence limits for *nitrate* and chloride, not using Cujo Lake as a mixing area for minewater coming from the Misery area, and the need for a new financial security estimate (money set aside to return the mine to its natural state if the company cannot or does do the work).

A public hearing was held in Behchoko on February 12–13, 2013. A number of the Agency's remaining issues were resolved at the hearing or in the draft water licence put together by the WLWB.

Overall, the Agency was pleased with how the WLWB ran the renewal process and with BHPB for putting a lot of effort into the work. We were pleased to see that *nitrate* and chloride will be regulated in the new licence and that there will be a special plan to reduce *nitrate* from explosives. We will report next year on the new water licence when it is issued in the summer of 2013. *dioxins and furans* in these small fish that live on the lake bottom. This would help everyone to understand if the relatively high levels of *dioxins and furans* found in the sediment at Kodiak Lake is getting into the fish. We believe that more work is needed.

Two special studies were done in 2012. The endocrine-disrupting compounds study that we asked for was done in a timely way and showed that the most common compound is not a problem. We were pleased to see BHPB's action on this new concern. Work remains to be done on the Panda Diversion Channel (PDC) but we do not know when the company will do it. The Agency is pleased to see that lessons learned will be used in the building and monitoring of Pigeon Stream Diversion Channel.

Finally, the Agency was pleased that BHPB followed our advice to study dust deposits on water systems. Its AEMP re-evaluation report (December 2012) states that contributions of dustfall to lake water at Ekati were very small. The company has committed to studying this again whenever its Air Quality Monitoring Program shows higher amounts of dust. ■

![](_page_16_Picture_16.jpeg)

Pigeon Stream Diversion construction, April 2012.

![](_page_17_Picture_0.jpeg)

Misery Road.

### HIGHLIGHTS

2011 Air Quality Monitoring Program Report (2009-2011) submitted in June 2012. The Agency hired outside experts to review the report.

Agency concerned same problems still occurring with air quality sampling methods.

Some progress on incinerators but need to test and develop an operating plan.

# **AIR QUALITY**

## Activities 2012-13

- he Ekati Air Quality Monitoring Program (AQMP) has 7 parts:
- 24-hour air monitoring;
- Monitor weather daily;
- Measure total suspended particulates (TSP or dust) every 6 days;
- Monitor dustfall in the summer;
- Calculate air emissions and greenhouse gas yearly;
- Sample snow chemistry every three years; and
- Sample lichen every three years. Results are reported every three years. The last AQMP report was issued in June 2012 for 2009-2011. In 2012 we hired a consultant to review each part of the Air Quality Monitoring Program (AQMP).

Two new waste incinerators for Ekati began to operate in 2012. In 2013 the company expects to start an incinerator monitoring program. It will include incinerator stack testing. This is when they test the smoke from the burning garbage.

BHPB has made some changes to reduce the amount of plastics sent to

the incinerator. They have switched from plastic to bamboo and other material for cutlery and dishes that burns with fewer bad chemicals released. They are also going to use a new type of corn based garbage bag. We commend BHPB on using more environmentally friendly products.

## Agency Comments What is Working

The Agency is pleased with BHPB's work to improve the AQMP. The continuous air monitoring building is now in a better place, downwind from the mine. The snow and lichen sampling programs are better and in some cases dustfall sampling sites are at the same place. This lets the company compare the results. The lichen monitoring program seems to be well designed and gives useful data.

BHPB has begun to consider the long-term effects of stray dust. BHPB has also followed our suggestion and has examined possible dust effects on water. This was done in its 2012 Aquatic Effects Monitoring Program (AEMP) re-evaluation report. That report states dust amounts in lakes were too small to have any impact.

BHPB has agreed that its longterm air monitoring datasets are not very complete due to problems with equipment. The company says it is working on improving this situation.

The new incinerators at Ekati are in place and operating. This should lower the amount of *contaminants* entering the air and water.

#### What isn't working?

The air quality program still needs a lot of improvements. The company goals are fine, but high volume air sample (HVAS – uses a big machine that sucks in air and filters it to measure the dust) and continuous air monitoring have had a lot of problems. Machines have not worked well or been fixed quickly enough. This means the results are often poor or useless.

#### **High Volume Air Sampling**

Between 2009-2011, some HVAS filters gave negative values after analysis. There are two possible reasons for this: Parts of the filter paper was sticking to the edge of the machine and were torn, possibly making the filter paper lighter. We also noticed that there is no process in place to check the scale used to weigh the filter to make sure the scale being used is working properly.

The company should also look into why the dust collected from air samples go beyond the Canadian Ambient Air Quality Objective and the GNWT air standards.

There is another problem. The HVAS samples are being run from midafternoon to mid-afternoon. Sampling may miss events that do not happen every day, like blasting. Samples also cannot be compared to continuous air monitoring results, which are averaged from midnight to midnight. We recommend that HVAS samples be run from midnight to midnight too.

HVAS was conducted during the winter of 2010 -2011. The winter program had a number of sampling problems. There were freezing motors, filter paper covered in snow, and severe weather. Other mining companies and the government successfully

![](_page_18_Picture_12.jpeg)

operate HVAS in these conditions. We recommend BHPB ask them for help to improve the winter sampling methods.

#### **Continuous Air Monitoring**

During the 2009-2011, most of the continuous air monitoring numbers were not valid due to equipment problems. We note that there were two years of bad measurements before staff removed the equipment for repair. When air quality standards are exceeded, there are no efforts to look for causes.

#### **Dustfall Monitoring**

Helicopter landings might mess up dust samples that are taken nearby. BHPB noted this in its 2008 AQMP report. We see that the same problem is still occurring. New procedures have not yet been put in place.

Dust suppression is one way to reduce dustfall impacts. Different products are used on roads to keep the dust down. We would like to see more work by the company to study whether its dust control measures actually work. The amount of dustfall may be explained by changes in road usage, wet or dry conditions, the amount of time passed since suppressant was applied, and so on. Results may tell us that dust suppression activities need to be changed.

#### **Snow Chemistry Sampling**

In past reports, we have noted there were quality problems with snow sampling methods. Allowing samples to melt before analysis may cause some loss of *nitrates* and sulphates in the samples. We know that BHPB carried out a separate study to compare frozen and unfrozen snow core samples. The results were not helpful. We suggest the study be redone with more samples for a better comparison.

#### **Other Issues**

Local weather is watched to support monitoring programs at Ekati. The Koala weather station, however, was not operating in January, February, April and May of 2011. There are numbers missing for this time period. BHPB gives no explanation. Was the company aware of the problem? What steps were taken to fix it quickly? Weather measurements are important as temperature and wind direction will determine where dust and *contaminants* may go.

We would like to see the AQMP improved more. In past reports we have stressed the importance of understanding links between monitoring programs. We would like the mine to continue work on dust problems.

Inside the incinerator building.

![](_page_19_Picture_0.jpeg)

Grizzly bear.

## **HIGHLIGHTS**

Lac de Gras grizzly bear DNA study in 2012.

Limited monitoring of caribou being done.

Use of remote cameras to photograph animals near roads.

# WILDLIFE EFFECTS

## Activities 2012-13

The Wildlife Effects Monitoring Program (WEMP) looks at the mine's impact on wildlife. It measures how well the company is managing wildlife in and around the mine. The WEMP at Ekati is 16 years old. The 2012 WEMP focused on wildlife habitat and on caribou, grizzly bear, and wolverine. The WEMP reports what happened and what was seen. A major change is the use of remote cameras to count caribou and watch how they act.

GNWT's Environment and Natural Resources (ENR) held two wildlife workshops in Yellowknife in March 2013 that the Agency took part in. The main purpose was to review and set standard monitoring programs. The mines presented their monitoring program methods and results. ENR talked about regional monitoring.

#### **Ekati Mine Footprint**

The mine footprint increased by 212 hectares during 2012. The total area of the mine site is now 3,214 ha (32 km<sup>2</sup>).

#### **Wildlife Incidents**

BHPB continues to improve waste management. With fewer attractions in the dump, there are not so many wildlife incidents. The company tries to keep wildlife out of dangerous places. It is hard to get all workers to follow all the waste rules. The company reported:

- Fourteen vehicle-related animal deaths, but none were caribou or grizzly bear.
- Four animal deaths not caused by vehicles. Two were caribou, caused by wolves.
- Four groups of grizzly bears, two wolves, and two foxes had to be moved away from the mine site.

### **Caribou Monitoring**

In the past, BHPB has used air and ground surveys to monitor caribou. No air surveys have been done since 2009. In 2012, about 4,674 caribou were in the Ekati study area. Most were seen during northern and southern migration.

Caribou are of top concern for northerners. The recent big decline in the Bathurst herd numbers is important for the Ekati Mine. Low numbers of caribou make it harder for them to adapt to changes, which puts the caribou at more risk. The Bathurst herd count in June 2012 suggests that the population decline has stopped. However, the herd is not having a fast recovery. Mine development likely did not cause the whole decline. Communities, though, have singled out the diamond mines for changing caribou patterns and causing injuries from roads. What is causing caribou to avoid the land around the mines?

We hear that in 2012 BHPB worked with Diavik to do air surveys for caribou. No mention of the program was in the 2012 WEMP. During 2012, the behaviour of 69 caribou near Ekati was written up.

Seventy-six remote cameras were placed in 2012 to watch wildlife at the mine site, especially on the Misery Road. The cameras take the place of older snow tracking programs. The

![](_page_20_Picture_4.jpeg)

main goal for the cameras is to find out if tundra roads stop caribou from crossing. The cameras show more caribou in the Sable Road and Pigeon areas and less along the Misery Road, likely due to habitat differences. About 8% of caribou groups that came to roads turned back.

#### **Grizzly Bear Monitoring**

There are not many grizzlies on the barrens. In 2012 BHPB and Diavik Diamond Mine worked together to do a large-scale study to find how many grizzly bears are in the area around the two mines. Results are not ready yet. They will do the study again in 2013.

#### Wolf Monitoring

Yearly surveys of den sites are the main way used to watch wolves around Ekati. Of 22 historic dens checked in 2012, four were occupied in June, but no pups were seen in August. Only

> one den has been successful since 2007. This is likely due to lower caribou numbers rather than anything the mine has done.

![](_page_20_Picture_11.jpeg)

White-fronted Geese.

#### **Wolverine Monitoring**

Wolverine DNA sampling was done in 2005 and 2006. Then in April 2010 and 2011, studies were done at Ekati, Diavik and Daring Lake. Results were given at the March 2013 workshop. They showed that the Ekati sampling in 2011 was poor. This made it hard to figure out a trend. A final report about all four years of data has not been completed yet.

#### **Bird Monitoring**

Ekati no longer monitors tundra breeding birds. Regional raptor (predatory birds) surveys will be done once every 5 years. Hawks, falcons, and ravens nested successfully in pits during 2012.

### Agency Comments Review of the 2012 WEMP Report

In the 2012 WEMP report it was hard to see how Traditional Knowledge has been used in wildlife monitoring. Monitoring results were well presented, but their conclusion was sometimes off. For example, in talking about caribou monitoring, the WEMP report says that results in 2012 are like those of 2011, so caribou are getting used to the mine. We think this is wrong. The company needs to compare what the caribou are doing far from the mine too. Also, we believe that the wildlife research permit application is not the best place to announce

Long-tailed Duck.

### **RECOMMENDATION 2**

The Agency recommends that GNWT-ENR establish guidelines for when and how carnivore and caribou monitoring programs should be conducted. The guidelines should focus on standardizing methods and the use of monitoring data for mitigation, species management, and cumulative effects management. We suggest that draft guidelines be circulated by October 1st 2013, prior to the next scheduled wildlife monitoring workshop in late 2013.

changes to the WEMP methods.

We suggest that the discussion for each section should stress longer trends and the importance of results. The Agency would like to see future WEMP reports include more information on what is happening to wildlife at Ekati. We also need to know how the methods that the company uses to reduce its impacts on wildlife are working.

BHPB has removed raw wildlife monitoring data and weather data from the WEMP. We would like to see some of these data, like dates of snowmelt. This type of information aids in the understanding of results.

BHPB and Diavik Diamond Mine have worked on several joint programs in

recent years. BHPB took part in air surveys of caribou in 2012. However, the WEMP makes no mention of them. Just before writing this, it became clear that BHPB and Diavik asked ENR to stop the requirement for caribou monitoring using aircraft. We are very worried about this decision. We recommend looking at what happens to caribou when there is a change in mine activity. We strongly suggest that BHPB should either restart the air surveys or provide another monitoring program to do the same job.

Major changes have been made to the WEMP over the past several years. We congratulate BHPB for their leadership on the grizzly bear DNA study. However, progress has been slow in offering alternate programs to monitor caribou. The remote camera program seems to give interesting data on road crossings. But are the cameras giving us an understanding of how caribou react to the mine? Links between the Air Quality Monitoring Program (AQMP) and the WEMP should be made stronger, particularly how dust may be affecting caribou when they get closer to the mine site.

#### Wildlife Monitoring and Management

The March 2013 workshops highlighted the need to set guidelines for when and how monitoring should

![](_page_21_Picture_12.jpeg)

be done. Timing for when the Zone of Influence (ZOI – an area influenced by the mine and avoided by the caribou) should be looked at again has not been set. ENR is responsible for guidelines. They should include:

- Standard sampling methods, including timing;
- Development of ways to test and measure how well the company reduces its impact on wildlife;
- Triggers for measuring the ZOI;
- Shared data storage and study details to aid future efforts; and
- Making sure that the results from wildlife monitoring can be compared across mine sites. ■

![](_page_21_Picture_19.jpeg)

Remote camera on Misery Road.

![](_page_22_Picture_0.jpeg)

Frank Channel near Behchokò.

### **HIGHLIGHTS**

GNWT completed the Bathurst caribou herd summer range pilot project. More work is needed.

Little progress from AANDC and GNWT on best practices for caribou protection.

CIMP is focused on caribou, fish and water. Purpose of information not clear.

# REGIONAL MONITORING AND CUMULATIVE EFFECTS

## Activities 2012-13

Regional monitoring and analysis is a good way to understand possible combined effects from past, current and future human activities. What is new in this field?

The GNWT Department of Environment and Natural Resources (ENR) promised to do a study in the Bathurst caribou summer range in 2008. The work was finally released in 2012. The idea was to show how different ways of monitoring can work together to assess *cumulative effects*. It is not clear if GNWT is doing more on this project.

ENR hosted a caribou workshop in March 2013. The Agency took part as did people from the diamond mines. Some information was shared, and there is to be a working group. However, there was little real progress. The WRRB made its decision on caribou management on October 8, 2010. They recommended that AANDC and ENR work together on documenting the best ways to protect caribou during calving and after. There was little progress on this work in 2012-2013.

The Cumulative Impact Monitoring Program (CIMP) was expected to give information on the environment of the Mackenzie Valley. It was also to check on the integrated resource management system of the Mackenzie Valley, including how land use planning, environmental assessment, and land and water laws are working together. CIMP had a workshop in Yellowknife in February 2013 to talk about managing long-term effects. Fish, caribou and water are now the priorities for CIMP, but much of the work so far seems not to apply to the Ekati Mine. For example, there is no plan yet for studying impacts on Lac de Gras from the Ekati and Diavik Diamond mines.

![](_page_23_Picture_0.jpeg)

Whatì Community Hall.

### **HIGHLIGHTS**

Some community TK consultations done by BHPB, but no results yet reported.

Community-based TK projects are still funded by the company.

#### First stages of using TK in closure planning complete.

Use of TK in wildlife monitoring not reported in the Wildlife Effects Monitoring Program report.

# TRADITIONAL KNOWLEDGE

### Activities 2012-13 Community-Based TK Projects:

Proposal for Digitization of Elders Stories'. This will move elders' stories from old audio tapes to a computer digital form. The Prince of Wales Museum is also part of the project.

**Lutsel K'e Dene First Nation:** Phase III of Łutsel K'e's 'Traditional Knowledge Archive Project'. This will make a computer database to keep Łutsel Ke's TK for the future.

North Slave Métis Alliance: 'Community Heritage Project'. The project develops family trees for North Slave Métis. Community workshops are included.

#### Kitikmeot Inuit Association:

'Content Development of the Naonayaotit Traditional Knowledge Project (NTKP) Publication'. The KIA is building TK content for future books. The books will be for schools, Hunters and Trappers Organizations, Elders Centres, Libraries and Visitor Centres.

#### **Tłįcho First Nations:**

The 'Thcho Digitizing Tapes and Database Project' is preserving storites from elders and hunters. The stories are saved into computers and maps at the Thcho Land Protection Department.

#### **Ekati-Based TK Projects:** Community Engagement

Community members went to the mine site for tours. They saw how environment monitoring and management are done at Ekati. Activities in 2012 include:

- 'Freshet Tour' (June 2012). It showed how the Ekati Mine manages water during the spring melt.
- 'Non-lethal Fish Sampling' (August 2012). It gave hands-on experience of the new fish sampling program where fish are not killed.
- 'Ekati/Diavik Community Caribou Monitoring' (September 2012 for Yellowknives; October 2012 for Tłıchǫ). It showed how caribou monitoring programs are done at both diamond mines. The Yellowknives Dene took part for 4 days at each mine site.

### TRADITIONAL KNOWLEDGE | 23

- 'Interim Closure and Reclamation Plan (ICRP)'. An update on the ICRP was given. Workshops were proposed to bring communities together to talk about *reclamation*.
- 'Grizzly Bear DNA Project'. North Slave Métis helped BHPB to locate suitable grizzly bear habitats to set up hair sampling posts, based on what they consider to be areas that bears may use a lot.

The company also told us that its wildlife monitoring programs benefit from job-shadowing. Aboriginal community members work with the Ekati Environment Department for five to seven days. They say this allows for sharing information. It also builds capacity in the community.

In 2012, the TK focus in the Aquatic Effects Monitoring Program was on fish health. Experienced Aboriginal fishers worked with biologists to check the health of fish in lakes downstream of the mine. Notes were taken on deformities, eroded fins, sores, tumours, and parasites. The insides of the fish were also checked and problems noted.

#### **Reclamation Research**

- TK literature was searched for help on design of barriers. These would stop animals getting into mined out pits during flooding. No details have been reported yet.
- A literature review on TK use in restoring other northern mines was done in 2012. Thirty-three projects were reviewed. They included the Alberta Oil Sands, Faro Mine, Giant Mine and Colomac Mine. BHPB reports it learned and will use these ideas:

![](_page_24_Picture_9.jpeg)

- Keep communities informed of *reclamation* activities. Name local people to aid communications.
- Studies to look at conditions before mining started are a good reference point for *reclamation* plans.
- The links between *reclamation* and culturally important plants and wildlife provide a common goal for all.
- Use a targeted approach to data collection. Develop agreement and science-based standards.
- Choose ways to measure the landscape and ecosystems scales.
   Focus research on relationships.

## **Agency Comments**

The effective use of TK in environment management and in *closure* plans is a challenge. This important mandate was given to the company by our Aboriginal Society Members when the mine was licenced. While there are some good things here and there, it is sad that there has been so little success over the past 15 years.

In 2011, it seems some progress was made in community consultations. We have asked to see BHPB's reports from the consultations in 2012 but were told the visits were not documented. We also asked to see the company's TK literature reviews and reports done in 2012. We have not yet received these items. Without this information we cannot tell if the community program is working. We also do not know how TK is being used by BHPB.

Progressive reclamation (returning the mine to nature) and planning for *closure* work are behind schedule. DDEC should move ahead with a TK working group like the Diavik Environmental Monitoring Advisory Board's TK panel to help with *closure* planning. We believe it is vital to involve TK-holders in the design of *reclamation* and *closure*. Do not rely only on recording Aboriginal comments on the company's own study designs.

The company has not followed its own rules to report TK learned from community visits. The company needs to report on lessons learned from the communities. The company should tell us how the lessons are used in the *closure* plan. Checking fish health with community TK experts should help identify mine impacts. The company should look for more ways to use TK in aquatic and wildlife effects monitoring.

We are disappointed that use of TK in wildlife monitoring is not reported in the WEMP. ■

Rivière la Martre, near Whatì.

![](_page_25_Picture_0.jpeg)

Wek'èezhìı Land and Water Board Technical Session, October 2012.

### **HIGHLIGHTS**

24

WLWB ran a good water licence renewal process for Ekati. However, the financial security review was not done in a timely way.

AANDC still has too few inspection staff. Helpful technical support was given during the water licence renewal.

# DFO was downsizing but gave very helpful advice during water licence renewal and AEMP work.

GNWT workshops on carnivores and caribou were helpful but there was little leadership from ENR.

# HOW ARE THE GOVERNMENT REGULATORS DOING?

# The Regulators and Our Mandate

e are the public watchdog for environmental management at Ekati. We watch the government regulators, as well as the mine operation.

## **Agency Comments**

The regulators are still good at making sure that BHPB runs an environmentally sound mine. We were pleased to see the willingness among all regulators to work together and share resources.

#### Aboriginal Affairs and Northern Development Canada (AANDC)

The inspections carried out in 2012 by Jason Brennan, the AANDC inspector for Ekati, have been thorough and effective as in past years. However, we note that they were reduced from nine in 2010-2011, six in 2011-2012 to five in 2012-2013. This was due largely to the use of this inspector for other duties. This trend of too few inspections for NWT mines was also noticed by the federal Commissioner of the Environment and Sustainable Development. He reported in March 2013 on the need for more mine inspections by AANDC and greater efforts to ensure sites are not left to the public for costly clean up.

AANDC staff were very involved in the water licence renewal process. They continued to give good technical advice to the WLWB. We know that this has been hard due to their reduced resources. It is important for AANDC to keep the ability to hire independent experts despite the devolution process.

## Department of Fisheries and Oceans (DFO)

DFO staff continue to be helpful to the Agency. They do good technical reviews too. We await publication of their *toxicity* testing on northern fish species. This should help to set water quality goals and *contaminant* limits. DFO completed its work on Pigeon Pit development on time.

### HOW ARE THE GOVERNMENT REGULATORS DOING? | 25

#### Government of the Northwest Territories (GNWT), Department of Environment and Natural Resources (ENR)

ENR gave good advice in 2012 on air quality monitoring. We were also pleased with their lead in hosting caribou workshops. While the diamond mines were willing to take action, it is clear that ENR will need to take on more of a leadership role on monitoring and protecting wildlife. The Agency has heard that a new *Wildlife Act* is a priority for GNWT. We look forward to formal regulation of wildlife monitoring and management plans under the new law.

ENR has a broad mandate for environmental protection. They should have been more involved this year in a technical role when checking BHPB reports to the WLWB. With a devolution agreement now signed, it will be important for GNWT to take a more active role in reviewing Ekati applications and reports.

#### **Environment Canada (EC)**

EC continues to give essential technical advice. Its input over the last year was less than before. It plans to change the *Metal Mining Effluent Regulations* to cover diamond mines. We look forward to more details on this.

#### Wek'èezhìi Land and Water Board (WLWB)

We were satisfied with the water licence renewal process. We were pleased to see that the WLWB hired a water pollution expert to provide advice along with its capable staff.

WLWB completed some guidelines. We are still waiting for clear direction on the content and detail in management plans. We urge that support documents be written for the 'Water and Effluent Quality Management Policy'.

A guideline on *adaptive management* is still needed.

We were disappointed that the WLWB did not take steps earlier to make sure that a joint review of the financial security requirements was done before the water licence renewal.

![](_page_26_Picture_14.jpeg)

Flowering heather at Ekati.

![](_page_26_Picture_16.jpeg)

Road to Pigeon Stream Diversion.

![](_page_27_Picture_0.jpeg)

Pigeon Stream Diversion, April 2012.

### HIGHLIGHTS

#### BHPB still runs Ekati in an environmentally sound way.

Strong leadership on grizzly bear monitoring.

## Could improve on reporting wildlife monitoring program changes.

Good work on the water licence renewal.

#### AEMP improved. Better analysis and reporting.

2012 EIR much better than the 2009 EIR.

Poor progress on reclamation research and progressive reclamation.

# HOW IS BHP BILLITON DOING?

The Agency thinks that BHP Billiton (BHPB) still runs Ekati in an environmentally sound way, as it has for many years. Nothing bad happened this past year, largely due to BHPB's good environmental management. We have noted some areas that should be improved.

The Agency still has a good working relationship with the Environment Department staff.

We commend BHPB for their work on the water licence renewal. The water quality model was improved to predict downstream water quality until mine *closure*. This work made for a smooth and helpful process.

The Aquatic Effects Monitoring Program (AEMP) study was done well. We thank the company for accepting our advice about looking into possible effects from dust settling on lakes. The company responded well to comments on its proposed fish sampling. The company also acted quickly on our concern about endocrine-disrupting compounds (chemicals that can hurt fish reproduction). We were, however, sorry that 2012 fish sampling did not have enough data to tell us about possible harmful effects from chemicals (*dioxins and furans*) deposited into Kodiak Lake by the incinerator.

We were pleased with the improved 2012 Environmental Impact Report (EIR) that looks at longer term changes in the environment around the mine. A workshop looked at early EIR results and advice was provided to the company on how to improve the report format. We had urged the company to focus on how effective its environmental programs are and what impact there may be from the mine over a long period of time. We are pleased to say that the company largely did what we recommended.

BHPB showed strong leadership on grizzly bear monitoring. We would like to see better caribou monitoring. At the March 2013 wildlife workshops, we were pleased to see that BHPB was in favour of improved wildlife monitoring.

We urge the company to use its monitoring to help find what causes changes to wildlife and to find ways to reduce these impacts. For example, more work is needed to find what drives some caribou away from Ekati Mine. We think that more work on keeping dust down may help.

Air quality work has improved over the years at Ekati. There are still issues with the air quality monitoring program. No smokestack testing was done on the new incinerators. We are pleased the company has reduced plastic use, which is a big step.

Where is the progress on *closure* and *reclamation* at Ekati? The widening of the Panda Diversion Channel was

promised but not completed. Scheduled *reclamation* research has slipped by 1-2 years. Little work has been done on *progressive reclamation*, which is the fixing and cleaning up parts of the mine that are no longer in use. With the mine's plan to close in 2019, we need to see much more progress and soon.

Lastly, the Agency is happy with the better records of community site visits last year but the company did not do this in 2012-13. We urge the company to pick this up again. ■

![](_page_28_Picture_5.jpeg)

# **ACRONYMS**

- AANDC Aboriginal Affairs and Northern Development Canada, previously known as "Department of Indian Affairs and Northern Development (DIAND)" and "Indian and Northern Affairs Canada (INAC)"
- AEMP Aquatic Effects Monitoring Program
- AQMP Air Quality Monitoring Program
- BHPB BHP Billiton Canada Inc. ("the company")
- CIMP Cumulative Impact Monitoring Program
- DDEC Dominion Diamond Ekati Corporation
- DFO Fisheries and Oceans Canada (also known as "Department of Fisheries and Oceans")
- **DIAND** See AANDC
- DNA deoxyribonucleic acid
- ENR Department of Environment and Natural Resources (NWT), previously known as "Department of Resources, Wildlife and Economic Development (RWED)"
- **GNWT** Government of the Northwest Territories

- IACT Inter-Agency Coordinating Team
- ICRP Interim Closure and Reclamation Plan
- INAC See AANDC
- KIA Kitikmeot Inuit Association
- **KPSF** King Pond Settling Facility
- LKDFN Łutsel K'e Dene First Nation
- LLCF Long Lake Containment Facility
- MVLWB Mackenzie Valley Land and Water Board
- **NSMA** North Slave Métis Alliance
- NWT Northwest Territories
- PCBs Polychlorinated biphenyl
- PDC Panda Diversion Channel
- TK Traditional Knowledge
- WEMP Wildlife Effects Monitoring Program
- WLWB Wek'èezhìı Land and Water Board
- WRRB Wek'èezhìı Renewable Resources Board
- YKDFN Yellowknives Dene First Nation

# **AGENCY RECOMMENDTIONS 2012-13**

### **RECOMMENDATION 1**

The WLWB should issue a directive to the company to conduct and complete reclamation and closure of Phase 1 tailings pond and Old Camp in accordance with a prescribed deadline determined by the WLWB.

**WLWB Response**: Our intention is to present this topic to the Board at their upcoming meeting on June 17, 2013. Following this meeting, the Board's decision on how to proceed with DDEC's Annual Progress Report will be communicated to DDEC and all members of the Board's distribution list. [In a letter dated June 25, 2013, the WLWB required DDEC to submit a plan for the closure of Old Camp by July 31, 2013.]

![](_page_29_Figure_5.jpeg)

#### **RECOMMENDATION 2**

The Agency recommends that GNWT-ENR establish guidelines for when and how carnivore and caribou monitoring programs should be conducted. The guidelines should focus on standardizing methods and the use of monitoring data for mitigation, species management, and cumulative effects management. We suggest that draft guidelines be circulated by October 1st 2013, prior to the next scheduled wildlife monitoring workshop in late 2013.

**GNWT-ENR Response:** At the wildlife monitoring workshops held in March 2013, the Wildlife Division agreed to draft standardized monitoring protocols for wolverine, grizzly bears and barren-ground caribou. Draft protocols will be reviewed and refined with partners during our fall 2013 follow-up workshops.

The intention is to share the draft protocols with workshop participants so they have time to review them before the fall workshops. Work on the drafts is ongoing and in some cases, results of previous year's work still need to come in before statistical analyses that will inform the development of the protocols can be conducted.

The Wildlife Division is also working to develop a Bathurst Caribou range plan with our co-management partners (first meeting coming up in early July). The Wildlife Division believes that this type of plan – and other programs/products discussed at the March 2013 workshop, including the development of a research and monitoring program for wildlife in the Slave Geological Province - will inform how monitoring using agreedupon protocols will link to species management, mitigation of any project specific impacts, and cumulative effects assessment and management.

# GLOSSARY

Adaptive Management – Learning from environmental monitoring results and using the results to change and improve operations and monitoring.

**Closure** – Act of ceasing mining, processing and other production activities (final closure of the mining operation).

**Contaminant** – A substance not naturally present in the environment or present in amounts that can negatively affect the environment.

**Cumulative Effects** – Environmental changes or impacts from past, present and future human land use activities (e.g., exploration and mining) combined with natural factors (e.g., fires, climate change).

**Dioxins and furans** – A type of organochlorine that can cause cancer and other health problems. A group of chemicals that mainly come from the burning of waste.

**Effluent** – Wastewater that flows into a receiving body of water.

**Environmental Agreement** – Signed by BHPB and the federal and territorial governments in 1997 to provide environmental monitoring for the Ekati Mine not covered by other licences and permits. The Tł<sub>2</sub>cho Government, Akaitcho Treaty 8 First Nations (LKDFN and YKDFN), KIA and NSMA were involved in the negotiations.

Hydrocarbons – Elements made of only hydrogen and carbon. Hydrocarbons are found in oil products.

Kimberlite – A rare type of rock rich in iron and magnesium that sometimes contains diamonds. Created deep below the earth's surface, kimberlites are usually found in long pipe-shaped forms. **Molybdenum** – A metal that can affect trout just after they hatch.

**Nitrate** – A nutrient formed from nitrogen. Nitrate can affect the growth of baby fish.

**PCBs** – A type of organochlorine called polychlorinated biphenyl (PCB). A chemical used in electrical transformers as a coolant and insulating fluid. This chemical is dangerous for peoples health and requires special handling.

**Processed Kimberlite** – The crushed rock and water mixture that is left over after kimberlite ore has been processed by the mill to collect diamonds. Also called "tailings".

**Progressive Reclamation** – Reclamation that can be carried out during the construction and operation phases of a mine prior to final closure (e.g., rock waste dumps). See also "Reclamation".

**Reclamation** – The process of returning areas of land and water to healthy ecosystems after being disturbed by mining or other human activities.

Tailings – See "Processed Kimberlite".

**Total Suspended Particulates** – Portion of dust released into the air that remains in the air.

**Toxicity** – The ability of a material to cause harmful effects in a living creature.

Waste Rock – Rock that must be removed to access kimberlite pipes, or rock that contains diamonds but that is not worth mining or processing.

**Wastewater** – Water that contains wastes from the mining process (e.g., sewage and chemicals from explosives).

![](_page_30_Figure_21.jpeg)

NUNAVUT

![](_page_31_Picture_0.jpeg)

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# PLAIN LANGUAGE ANNUAL REPORT 2012-13

A PUBLIC WATCHDOG FOR ENVIRONMENTAL MANAGEMENT AT EKATI DIAMOND MINE™

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