

**Independent Environmental Monitoring Agency
17th Meeting of the Board of Directors
Rae & Yellowknife, Northwest Territories**

February 11th — 13th, 2000

Summary of Discussion

Directors

Red Pedersen	Tony Pearse
Fikret Berkes	Bill Ross
Peter McCart	François Messier
Kevin O'Reilly	

Staff

Alex Thomson	John Holman
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Friday February 11th, 2000, 8:20 a.m.; Yellowknife

Review of Agenda

Additions to the Agenda:

- Bulk sampling at the BHP Expansion Project (Beartooth, Sable, Pigeon)
- *Impact 2000* Report
- Debriefing on the Cumulative Effects Assessment and Management Workshop

Information Updates

The **chair** mentioned that the West Kitikmeot Slave Study (WKSS) met in Kugluktuk. The Hunters and Trappers Association also hosted a regional meeting in Kugluktuk, where Chris Hanks introduced BHP staff.

François Messier reviewed a draft copy of BHP's 1999 Wildlife Environmental Monitoring Program (WEMP) report, and participated in the workshop on wildlife effects monitoring program in early February. In addition he carried out routine tasks with regards to treasurer's business.

Bill Ross reported that he had talked with Helen Butler (BHP Environment Division). She indicated that heavy metal uptake was evident in vegetation, demonstrated by high concentrations of nickel in samples located near the coarse kimberlite stockpile.

Fikret Berkes participated in the Cumulative Effects Workshop in December 1999 and followed up on some Agency business with the Métis and Lutsel K'e. He commented on the Traditional Knowledge content of the Compliance Report.

Kevin O'Reilly participated in BHP's Aquatic Environmental Monitoring Program (AEMP) and WEMP workshops. He was sent a letter from Akaitcho Treaty 8 notifying him that his directorship was rescinded as of February 13, 2000. Kevin sent them a reply on February 8, 2000, thanking the organization and offering his assistance in the transition to the next Akaitcho Treaty 8 appointee.

Pete McCart reported that the 1999 Aquatic Environmental Monitoring Program (AEMP) was informative. He recommended that the Agency focus on the pending Extension (proposed Beartooth, Pigeon & Sable projects) rather than BHP's existing operating programs.

Alexandra Thomson reported that Geo North is hosting a workshop on Water Licence Security next week, February 18th & 19th. Agency staff attended the Northwest Territories public hearings on the water licence for Diavik Diamond Mines International (DDMI), December 13-15, 1999 in Yellowknife.

BHP Presentation

Don Hayley, EBA Engineering Consultants Ltd.

Ed Grozic, EBA Engineering Consultants Ltd.

Scott Williams, BHP

Derek Chubb, BHP

Chris Hanks, BHP

Tina Markovic, BHP

Denise Burlingame, BHP

Scott Williams reported that the Engineering and Environment department experienced the first injury on-site in 41 days. Production was going well and the winter road was running at 100 per cent. Reverse circulation (RC) large core kimberlite sampling continued on the claim block. The Department of Indian Affairs and Northern Development (DIAND) inspected three sites last week and identified no instances of non-compliance.

Nuna Logistics was hired to complete the Misery Road, install temporary facilities, as well as, begin pre-stripping at North Koala and Misery Lake. Overburden materials will be deposited in the waste rock pile or, in the case of sediment, set aside for reclamation. Rock materials have been stockpiled at Paul Lake for constructing Misery Road. Road construction for Misery is scheduled to continue in March 2000 and will likely be completed in early summer.

A bulk sample of 220,000 tonnes will be done at Koala North. A preliminary RC drill sample showed two or three large diamonds in the sample, which skewed statistical analysis. Pre-stripping of the Koala pipe is beginning and it will be mined between 2001-2006.

BHP's workshops on the Aquatic Effects Monitoring Program (AEMP) and the Wildlife Environmental Monitoring Program (WEMP), held in Yellowknife February 7-10th, 2000, went well. The Operating Environmental Management Plan (OEMP) is scheduled for release in late February. The Environmental Assessment will be released in early March. The *Impact 2000* report will be issued at the end of April.

There may be some community visits in early April to discuss the 1999 Annual Report on the Environmental Agreement, which will be released in March.

Tina Markovic reported that the Environmental Assessment for the project expansion is scheduled for issue in early March. In response to the concerns regarding tailings containment, which were raised in the Agency's most recent annual report and Environmental Agreement Compliance Report, BHP has requested that Don Hayley of EBA Engineering Consultants Ltd. present information on the issue. EBA Engineering Consultants Ltd. designed the processed kimberlite containment area and management system.

Don Hayley gave some background on the kimberlite containment area. He displayed slides of the Processed Kimberlite Management System.

Derek Chubb reported that there is no apparent visual change in Cell C due to an emergency release of tailings. Aerial surveys show no change in the lake water clarity this year from last.

The **directors** were interested in how long Cell C was used for emergency tailings deposition.

Derek Chubb replied that the emergency tailings discharge lasted approximately a week.

Scott Williams pointed out that it was also used for less than 24 hours in this year.

Don Hayley described the operations of the filter zones. Processed kimberlite is discharged in various locations of Cell B. The material has behaved as BHP predicted. An aerial photograph of the area was displayed, dated July 1999. BHP committed to putting together aerial photographs of the various cells at regular intervals to provide a visual demonstration of what is happening in Long Lake.

The **directors** asked about the consolidation of tailings over time and the capacity of the tailing containment area to meet the needs of BHP's existing and proposed development, as well as how extreme conditions were incorporated in the water balance.

Don Hayley replied that the key factor that determines capacity is the height of the dams. The engineers took precipitation for two back-to-back wet years, which is a 100-year-event. A design report has been prepared for each structure that comprises the processed kimberlite containment area. The construction surveillance is documented in an "as-built" report for each structure that includes results from quality control testing.

The original design was developed for 20 years of deposition (1998-2018)--that total capacity has not been changed even though the mine life has been shortened. The revised water/solids balance that includes Sable-Pigeon-Beartooth indicates that Cell A will be filled in 2005, Cell D will be filled in 2014, Cell C at 2012, and Cell B in 2001. Cell D could operate until 2018, providing 4 years of excess capacity. (These calculations are summarized in the Sable-Pigeon-Beartooth Environmental Assessment Report that will be filed at the end of April.)

The **directors** pointed out that extra kimberlite may affect the containment area, and asked what is the contingency storage?

Don Hayley replied that Cell D has four extra years of capacity for Fox-like tailings.

The **directors** asked what is the ratio of Fox-like tailings that have been deposited into the system to date.

Don Hayley replied that it is not being measured.

The **directors** pointed out that even if the Panda tailings are settling as predicted, without the interjection of Fox tailings, it is difficult to ascertain what will occur at the cells over time.

Don Hayley responded that the design capacity of the containment area was based on Fox tailings, which was the worst-case scenario from the tailings characterization testing that was done.

The **directors** asked to confirm whether the key design change is that some kimberlite will be put back in the pits, and the operation of the Processed Kimberlite Containment Area may be shut down earlier.

Scott Williams replied that this observation was correct.

The **directors** asked about the predictions for the anticipated water volume and its turbidity.

Don Hayley said that the site could be operated without any discharge for about 11 years if that were found to be necessary. . BHP is in the process of reworking the water balance. His focus is to eliminate any kimberlite deposition in Cell D by directing the entire processed kimberlite stream into Panda Pit at an earlier date than shown in the current mine plan. That option will continue to be examined as the future for Panda Pit becomes more clearly defined.

Chris Hanks reported that Lorraine Catholique of Akaitcho Treaty 8 and Rachel Crapeau of the Yellowknives Dene First Nation agreed to bring other Aboriginal groups into the Traditional Knowledge (TK) Working Group. Both Dogrib Treaty 11 and Yellowknives Dene First Nations see that the Traditional Knowledge Working Group has merit. The Elders who have repeatedly visited the site are in a position to participate in other projects.

BHP wants to involve the Dogrib group in the caribou monitoring programs at the airport. Chris has received some land use information out of Dogrib Treaty 11 on specific water routes and place names. There are a couple more traditional sites identified in the Lac de Gras area, which will be important in the EA. The Dogrib Treaty 11 map database work is being digitized.

Inuit Traditional Knowledge will be transcribed in the next year. Stanley Anablak is working on this project with the Kitikmeot Hunters and Trappers Association. Natasha Thorpe's work on the Bathurst herd calving grounds is another report BHP is interested in.

The **directors** asked what is the Agency's role. How can the Agency help?

Chris Hanks replied that holding a TK Working Group meeting in conjunction with an Agency could increase benefits from the exchange between disciplines. The Aboriginal groups want to develop a way to maintain participation in the mining industry. The TK Working Group should be formed as soon as possible, and for those Aboriginal groups who do not want to be involved they can choose not to participate.

On the winter road, BHP will do an internal environmental audit from Tibbit Lake to BHP. BHP will fly the route in March and April 2000. Last year the company audited the facilities and the pits, and this will be done again in March and April.

Scott Williams invited Pete McCart to participate in the reconnaissance and will provide the Agency with an overview of the audit findings once it is complete.

Chris Hanks pointed out that the Yellowknives Dene First Nation will be on the interview list for the environmental audit, but it is not clear whether an Elder or a representative from the Lands and Environment Committee will be approached. All functioning winter roads will be examined this year. The audits are tools to make better management decisions.

Scott Williams asked the Directors to use the trademark in the use of the EKATI™. The Dogrib people apparently do not object to the use of the word "Ekati" as long as the accents are removed and capital letters are used. The trademark was made official in the last month. He expressed appreciation for Kevin O'Reilly's work on the Agency.

1. Action Item: Alexandra Thomson will write a short letter thanking BHP for its consultant's presentation and photographs on tailings management at the mine site at the Board Meeting, mentioning that the Agency will look forward to more information on tailing management in the Abandonment and Restoration Plan.

- LUNCH: TRAVEL TO RAE -

™ For the purposes of this document, EKATI™, upon first reference will be identified as property of BHP, but afterwards will be referred to as "Ekati".

Dogrib Treaty 11 representatives were unavailable to meet the Agency

Updates (continued, 2p.m.)

John Holman updated the directors of his activities. He was asked about the minutes and how the drafting proceeded. He replied that it was a long process, but constructive. The **directors** discussed the scope of the comments and the remarks made in the minutes.

2. Action Item: John Holman edit the 16th Board Meeting Minutes as discussed and send to the Chair for approval.

Tony Pearce attended the AEMP & WEMP workshops.

Request for Assistance

The **chair** informed the directors that Jack Kaniak of the Kitikmeot Inuit Association (KIA) has requested assistance from the Agency to gain an understanding of the technical documentation on the BHP Project. The Agency is in a position to provide assistance to Aboriginal groups such as the KIA.

3. Action item: Alex Thomson will draft a letter to Jack Kaniak (KIA), and respond to other Aboriginal groups that make a similar request, offering the Agency's expertise on technical aspects of the BHP Project.

AEMP & WEMP Workshops

Bill Ross said that the bulk of the AEMP was well done and that he looked favourably on the work done by Deborah Mugli and Dave Tyson. BHP proposed several changes to the monitoring program.

François Messier commented that the workshop was well organized with many displays and posters providing visual information. It was accessible to the general public and Elders. The workshop led to excellent Elders' participation, out of which the following suggestions were made:

- There were numerous concerns on the processed kimberlite containment area and its potential risk to caribou;
- The effect of dust on vegetation and how it relates to caribou and its taste, should be studied; as well as;
- The Aboriginal people wish to participate directly in field monitoring using their own methodologies.

The data collection was presented and there were two shortcomings: the baseline monitoring of caribou in relation to the Misery/Sable roads, and the monitoring of grizzly bear activities in the vicinity of the mine site. The Agency and all government agencies noted many deficiencies in the analyses and reporting. The Agency volunteered to provide comments to BHP in the spirit of cooperation, with the hope that BHP will revise the 1999 WEMP report.

There are a number of studies dealing with the effects of the road. One is an aerial survey of caribou tracks along the road to help mitigate effects of road construction on caribou migration. The hope was to gather data on migration paths before and after the road construction. Further, there was no data reported on caribou behaviour close to roads

General thoughts on the AEMP & WEMP workshops included:

- Interpreters were not briefed on terminology beforehand. A workshop on terminology would be helpful;
- BHP should include a short response to the AEMP and WEMP to report on those recommendations it will implement;
- Poster session was good;
- WEMP needs improvement, and;
- There should be a presentation on the tie-in with other monitoring programs e.g. air quality for dust, habitat reclamation, etc.

- SUPPER AT THE SENIORS HOME -

AEMP & WEMP Workshops (continued, 7:10 p.m.)

The **directors** discussed the integration of community-based monitoring in the environmental management of the mine. Elders' participation in field monitoring should be supported, especially for caribou observations around the tailings pond, feeding areas, close to roads, and the airport fence.

4. Action Item: François Messier will draft an assessment of the WEMP report and workshop for review and condense it into a letter to BHP. Pete McCart will draft an analysis of their AEMP report and work. Both items will be compiled in a letter to BHP, which will be given to the directors for approval. Other comments will include congratulatory messages on the poster session, as well as constructive comments on how to improve the format next year.

Technical Reports: Seepage Survey, including Morin's report; Aquatic, Wildlife, Panda Diversion Channel and Kodiak Studies

Dr. Kevin Morin conducted a Geochemical Technical Review of BHP's 1999 Waste Rock Area Seepage Survey on behalf of the Agency. In Section 5.1, Dr. Morin concludes that acid rock drainage (ARD) is occurring on-site. He suggests that further studies are necessary, including mineralogical testing.

A discussion occurred on the implications of the ARD effects on the mine, including the roads and frozen dyke systems. Considering that 220,000 tonnes of all the waste rock may be acid generating, ARD must be seriously considered as a potential environmental problem that may require continual care at the mine. All ARD scenarios must be considered, especially in light of proposed development of Beartooth, Sable and Pigeon, as well as, new waste rock piles at Fox. BHP should be encouraged to investigate the matter further by getting more detailed information than what was provided in the initial seepage study.

Directors requested that Dr. Morin be available for a conference call in order to discuss the extent of the problem and which areas are the greatest source of ARD: the waste rock pile, dykes, or the coarse kimberlite.

The nature of sulphides (ARD rock) and its possible sources, such as mudstone, sediments (overburden), coarse kimberlite, etc., was discussed in the context of results from the AEMP. The **directors** recommended that spring freshet be monitored as it produces a short acid shock to the aquatic systems. Other potential issues to be closely examined are:

- Metal leaching (zinc, copper, and nickel);
- Acid pulses in the spring freshet due to copper and low natural pH;
- Waste rock drainage associated with Beartooth.

5. Action Item: Pete McCart will search for and report back to the directors on low pH levels and elevated metals, especially copper.

Sable, Pigeon, Beartooth Extension Projects: EA including Compliance Report

The **directors** reviewed the letters from BHP, Environment Canada and the Department of Indian and Northern Affairs (DIAND) about the status of the Leslie Pipe. The federal departments agreed that the environmental assessment for the proposed development should not focus on the trade-offs between the Leslie pipe and the new pipes. The cumulative effects must be taken into consideration when assessing the proposed development. It is a positive sign that BHP is being asked to address incremental impacts or cumulative impacts.

6. Action Items: On the Environmental Assessment document, directors will review the road impacts with respect to caribou, eskers and grizzly, the whole document, Traditional Knowledge, and water and fish.

Meeting adjourned for the day, 9:20 p.m.

DAY 2: Saturday February 12th 2000; Rae, 8:15 a.m.

Business Arising from Last Meeting

The September 1999 Newsletter and 1998-99 Annual Report were distributed to a general mailing list including federal and territorial representatives, municipalities, Métis and Dene organizations, and other communities. The poster display remains outstanding.

7. Action Item: The Agency will hire a specialist to update the Web site, add an archive of approved minutes, a copy of the BHP Environmental Agreement as .pdf document, the bylaws, an index of resource documents, and other information, as required.

8. Action Item: Buy a new computer for John.

Treasurer's Presentation

The **treasurer** reported that BHP paid the Agency all outstanding contribution payments for the installments and the move. As per February 1st, 2000 the Agency has utilized approximately 65 per cent of its budget. Aside from costs for the Agency Evaluation, website update, the Annual Report, year-end meeting and audit, the office may benefit from purchasing a computer, a digital video camera, white board and screen, chairs with back support and signage.

The Evaluation of the Agency

The draft terms of reference for the Evaluation of the Agency contract was reviewed and amendments were made. It was recommended that directors and Agency members should be on the interview list, as well as, the regulatory agencies, Aboriginal organisations and BHP. Further discussion was held on the timing of the RFP, awarding the contract, interview times, drafting an evaluation, and debriefing the directors at the next board meeting. The **directors** decided that the job will be advertised, and that an approval committee to evaluate the proposals will be created. The criteria for contract approval should include the following categories:

- Northern experience;
- Aboriginal activities;
- Methodology;
- Dollar value.

9. Action Item: The Agency will proceed with the RFP for The Evaluation of the Agency.

Meeting adjourned at 11:03 a.m.

- LUNCH: TRAVEL TO YELLOWKNIFE -

Tony's Email RE: Gaps

The **directors** identified a need for a more systematic means of tracking the monitoring plans and the fulfillment of goals in the Environmental Agreement. The Agency needs more information on the waste management plan, for example, but it has not been a priority. Only substantial environmental issues need to be followed up, such as the Abandonment & Reclamation plan, regulatory compliance, and archaeological sites. It was recommended that a tracking system be developed to monitor mine sites and pipes, bulk sample dates, results, and map locations.

10. Action Items: Staff will develop a running list of recommendations and follow-up on actions to address these recommendations.

It was recommended that staff forward spill and inspection reports of interest to the directors, as soon as possible. The scope and details of archeological work and reports should also be monitored. Sensitive and confidential archeological reports given to the Agency to review must be reviewed closely, and the site locations kept confidential.

11. Action Item: The introductory segments of the BHP archeological reports, including conclusions and recommendations, can be photocopied as long as locations are not recorded. These reports should be used to review BHP's performance with the appropriate regulators.

Annual Report

It was agreed that the Agency would request a formal quotation from OutCrop to help draft the annual report of 2000. It was decided that the report would reflect last year's annual report format in size and format. As the production is similar, it is expected that the cost would be less than last year. Some of the important issues to be included in the annual report are:

- The budget and work plan for the next year;
- Sediments and waste rock;
- ARD from the coarse kimberlite and waste rock piles;
- Kodiak Lake sewage and the nitrates that pose a threat to downstream waterways, and;
- Eutrophication, Panda Diversion Channel, and metals (Copper);
- The footprint of land disturbance being experienced due to expanding into different drainages should also be added;
- New Project Proposal – Sable Road vs. Caribou;
- Cumulative Impact – New Drainages & Caribou;
- Caribou – Misery Road & Tailings;
- Dust (snowcore reports);
- Traditional Ecological Knowledge – Elders input into workshops and site visits, Phase II Studies, Community Based Monitoring;
- Self-Assessment & Evaluation, and;
- Assessment of Regulators (DOE, DFO performance at the WEMP & AEMP workshops).

12. Action Item: Alex Thomson will draft a Table of Contents and work plan for the Annual Report. *OutCrop* will be contacted to complete the graphics.

Vacation Travel Assistance

A motion was approved to grant staff Vacation Travel Allowance.

Date of the Next Meeting

Next meeting will be held March 31st, April 1st and the 2nd in Yellowknife, in conjunction with the Traditional Knowledge Working Group meeting, if possible. Fikret will join this meeting by conference call on Saturday, and as required. The following meeting will be April 26th and 27th, when all the directors will be available.

Meeting adjourned at 5:20 p.m.

Sunday February 13th, 2000, 9:15 a.m.

Communications

The **directors** reviewed the proposed storylines for the next Agency newsletter. The public should be updated on BHP proposed development. It was recommended that the general comments in the summary of discussion provide stories for the newsletter, such as Elders' participation in the AEMP and WEMP; caribou and nursing pairs; Phase II studies; community monitoring; the current board meeting, cumulative effects workshop, and meeting in Rae and hosting the supper.

Promoting the Agency's profile was discussed.

13. Action Item: Purchase promotional items with surplus money.

Kevin Morin's Seepage Study

Tony Pearce introduced the directors and staff to **Kevin Morin**, who joined the meeting via telephone.

The **directors** asked Kevin Morin what the conclusions in his report meant, and whether BHP's plans to introduce permafrost dykes will prevent ARD.

Kevin Morin qualified his report with the statement that he has conducted contract work for Rescan on the Ekati mine in the past, but has not seen the samples or the site.

He was asked whether permafrost provides effective mitigation to ARD when used in dams.

Kevin Morin replied that permafrost does not stop oxidation, which generates heat. The containment area could be frozen on the outside but could be up to 52 degrees Celsius in the centre. It would be active and waiting for a summer thaw. The frozen berms would have to be built higher and higher as rain and snowfall generates more water. He commented that the 1999 seepage survey showed that BHP has a problem with a high level of sulphates and a decreasing pH.

The seepage survey shows elevated acid levels everywhere. BHP will have to keep track of the water alkalinity.

The **directors** questioned whether the acidification of kimberlite would change as the material is crushed.

Kevin Morin explained that the rejected kimberlite may have mudstone in it or other rock that is not diamond-bearing. It could be that they are getting more pyrite, which will generate high level of sulphates. More analysis is needed to determine the neutralising potential of the materials in the area. He pointed out that Acid Based Accounting should show net acid generating rock. If kimberlite is spread in a thin layer there may still be an acid problem at a lower concentration. There is humidity cell data on the back of the report.

The **directors** asked if there are any indications on how long this may be a problem.

Kevin Morin responded that it could continue for 50 to 100 years before the water is cleaned up, based on sulphate levels above 1,000 milligrams per litre. If sulphates and pH are not regulated, then the water does not have to be treated. If that water is then discharged it could generate a problem.

The **directors** asked about the dilution rates and effects on ambient quality in the case of diverting the waste rock pile water into Long Lake.

Kevin Morin explained that the ARD may be a problem in other areas of the site. Since sulphates are high and pH is low the acidity in the sulphates is starting to climb in other areas. It appears that every concentration will be going up; if it is filling the lake there could be a problem.

14. Action Item: Tony Pearce will draft a letter to BHP suggesting further research and studies on the ARD are needed, as well as adding sulphates to the data for the Panda Diversion Channel and Long Lake discharge SMP stations, and attach the Morin report for its information.

15. Action Item: Tony Pearce will draft a letter to the NWT Water Board, which advises them that amending the pH range in the water license is premature based on ARD concerns. The Morin Report and letter to BHP will be attached.

16. Action Item: Acquire a map of SMP and AEMP stations at the BHP mine site, as well as, the available AEMP and WEMP posters that were at the workshops. Get a copy of BHP snowcore sample report and available aerial photos of the site.

Draft Human Resource Policy

Alexandra Thomson briefed the directors on policies and procedures adopted by other Boards, including Code of Ethics. It was decided that the Human Resources Policy should apply to the staff only and a Code of Ethics was not necessary for the Directors. Another draft will be circulated with the recorded amendments.

Fox Lake, License Amendments

The **directors** examined the issue of the water license amendments to dewater the Fox Lake Basin, and allow it to drain through a boulder field. The EIS does not make any reference to lake dewatering and depositing mine water through land treatment. Discussion focused on the dewatering of the Fox Lake basin and potential impacts. Nero and Slipper Lake may be loaded with phosphorous.

17. Action Item: Investigate whether the dewatering amendment has been granted, and if DIAND has concerns. If the license has not been granted, then recommend that potential impacts of dewatering Fox Lake through a boulder field be evaluated.

Next meeting will be March 31st, April 1st and 2nd in Yellowknife.

-Meeting Adjourned-

**Meeting Summary
Approved by the Board:**

Chair

March 31st, 2000
Date