NORTH SLAVE MÉTIS ALLIANCE

PO Box 2301 Yellowknife, NT X1A 2P7

February 13th 2007

Sarah Baines
Wek'èezhìi Land and Water Board
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Ekati Diamond Mine 2005 Air Quality Monitoring Program (October 2006)

Dear Ms. Baines,

We have reviewed the aforementioned report written by Rescan Environmental Services Ltd for BHP Billiton Diamonds Inc. Although the report is extensive and provides much information, there are also some editing problems with the report, which make it hard to read. The following are examples, but is by no mean extensive, of readability problems with this report that we expect should be addressed by Rescan and BHP in future reports:

- **Layout of Report:** It would be easier to read if the methodology for each study (Air and Greenhouse Gas Emissions, High-Volume Sampling, and Snow, Vegetation and Lichen Sampling) were followed by its corresponding results. The current layout requires a reader to flip back and forth to fully understand results and any calculated variables.

- **Excessive Condensation of Text**: Sections 3.3 to 3.5 are hard to read and the reviewer has to spend extra time flipping back and forth to review relevant information. This is because the text for Section 3.4 and 3.5 is dissociated with its corresponding figures due to the large number of figures and tables for Section 3.3. This could be remedied if every section is placed on its own page with the corresponding figures immediately following.

- **Incorrect Citation in Text**:
  - On page 3-1, the citation for Table 3-5 should be Table 3-3
  - On page 3-5, the citation for Figure 3-3 should be Figure 3-4. Figure 3-3 should be correctly cited in the first paragraph along with Table 3-4.

- **Mistakes In Presented Information**:
  - In Table 4-4 of Appendix 4 has inconsistent results. The table mentions an alpha of <0.01 (a value we disagree with, see the next section), however both Manganese and Zinc with p=0.050 and 0.026, respectively, are said to be significant, while pH with p=0.036 is said to be not significant.

- In Table 4-5 of Appendix 4 not all the compounds with >20%RPD are highlighted. For maximum tissue concentration cadmium, lithium, mercury tin and uranium are not highlighted. For the 95% UCLM uranium and vanadium are not highlighted plus thallium is falsely highlighted.

- **Results Missing From Main Text**: Some information from Appendix 4 should be in the main part of the text. A table in the main text should include, at least, mean tissue concentration near the mine and background with some form of variability, and results of the three approaches used to answer the research questions (pg 2-10). It is not sufficient to show the results of two selected chemicals.

- **Missing Information from Report**:
  - Figure 2-1 has a dot west of Ekati that is not labelled. Is this AC-44 referred to in the text as being excluded in the baseline data due to proximity to the 0.5 isopleth?
  - Table 4-4 of Appendix 4 should include some form of effect size so the reader can determine, without having to flip to another table, the nature of the significant difference, i.e. are the concentrations higher at the mine site or in the background.
  - Table 4-6 of Appendix 4 should have the results for each of the 36 chemicals, not only the significant chemicals. This is particularly important when a reviewer does not agree with the alpha number chosen to test for significance.

- **Accountability**: Who is accountable for the information in this report? Who is accountable for the editing of this report? A signature page with the names, positions and qualifications of the individuals who take responsibility for this report would increase the reader's confidence in the validity of the reports' results.

This said, the following are our specific comments and concerns with this report:

- **High Volume Air Sampling (HVAS)**:
  - BHP should increase the number of HVAS and should add dust collection stations to provide field data for comparison with the CALPUFF model. Particulate deposition is particularly important in the summer and this is not covered during the more thorough snow core sampling.
  - BHP should investigate the use of climate-controlled shelters for Partisols to collect TSP, PM_{10} and $PM_{2.5}$ measurements during the winter, as suggested by Golder Associates in the "Snap Lake Project Air Quality, Meteorological Monitoring and Emissions Reporting 2005 Annual Summary", pg. 20. This would also increase the TSP data available during the summer in the event of technical problems with the high volume samplers as occurred in 2005, which resulted in the lowest number of samples collected since the beginning of monitoring at Ekati.

- **Snow Core Sampling**: Why are the surface loading rates only calculated for seven sites? We note that in Figure 3-1 sampling locations AQ-03 (the sampling location nearest to the mine site) and AQ-05 are missing aluminium and TSS surface loading values for 2005. This brings the temporal comparison to only 5 sampling sites for 2005. We believe this is inadequate to make a valid temporal comparison, in particular since data is missing for two of the three sampling sites nearest to the mine site and the remaining sampling location that is nearest to the mine does seem to have an increasing temporal trend in 2005.

- **Lichen Tissue Sampling**: We believe it is important to compare absolute values of RPD (%). This monitoring should not only be concerned with compounds that are found in higher concentrations in lichen tissue near the mine site, but also compounds that are deficient in lichen tissue near the mine site. If lichen are deficient in a limiting compound they could suffer from growth problems and those nutrients would not be available for organisms that eat lichen, such as caribou. Of particular concern noted by this reviewer is the significant decrease in nitrogen and phosphate in lichen near the mine site, two compounds important in plant growth. Also, the higher concentration of antimony and arsenic in the baseline data is of concern and the baseline data should be investigated for possible sources of contamination.

- **Alpha Value**: The alpha value used in the lichen tissue sampling is 0.01, and it is unclear if this alpha is also used for the regression analysis with the snow core sampling. Such a conservative alpha value is of concern to the NSMA because, although it means the monitoring program is less likely to suffer from a false positive (finding a significant difference when none exists), there is an increased chance of committing a false negative (finding no significance when in fact there is one). Generally accepted in scientific literature is an alpha of 0.05. However, the reader can make their own decisions regarding alpha values, as long as they are provided with all the information to do so. This is not the case in this report; we are not given all the p-values for the zone of influence calculations in the snow chemistry data (Table 3-4, pg. 3-5) or for the analysis of variance (Table 4-6, Appendix 4) for every chemical analysed.

- **Traditional Knowledge**: The 2005 report has no traditional knowledge component. Traditional Knowledge should be incorporated into the design, implementation and interpretation of results for air quality monitoring.

Sincerely,

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Manager, Lands and Resources
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