



October 27, 2008

Phyllis Beaulieu  
Manager of Licensing  
Nunavut Water Board  
P.O. Box 119, Gjoa Haven NU X0B 1J0

Dear Ms. Beaulieu:

**Re: Baffinland Iron Mines Corporation (BIMC); Submission of an Addendum to the Landfill Site Design Report for the Mary River Project.**  
**NWB File: 2BB-MRY0710/Part D19**

On September 10, 2008, Baffinland Iron Mines Corporation (BIM) received a letter from the Nunavut Water Board (NWB) approving the above referenced design report dated November 13, 2007. In the same letter, a request was made of BIM that either an addendum be submitted that addresses review comments received from the NWB, the Qikiqtani Inuit Association (QIA)<sup>1</sup>, Environment Canada (EC)<sup>2</sup> and Indian and Northern Affairs Canada (INAC)<sup>3</sup> or that a revised report addressing the review comments be submitted.

It should be noted that a revised Landfill Design Report (Rev 1)<sup>4</sup> was submitted to the NWB on March 31, 2008, as an appendix to the annual Water Licence 2BB-MRY0710 report package. Furthermore, this revised report addressed many of the review comments submitted by the NWB, QIA, EC, and INAC. The main difference between the November 13, 2007 and March 31, 2008, versions of the Landfill Design Reports (Revisions 0 and 1, respectively), is that the latter revision included a section entitled: Section 5.0 - Operations and Maintenance Manual. Revision 0 (the approved design report) did not include an operations/maintenance section. Revision 1 also included additional referencing to guidelines and other documents.

To address the aforementioned request in the NWB September 10 letter for an addendum, BIM attaches, herewith, the following documentation:

- 1) Attachment A: Response to reviewers' comments - This portion of the information package provides BIM's responses to comments received from the NWB, QIA, EC, and INAC.

---

<sup>1</sup> Letter from John Amagoalik, Qikiqtani Inuit Association, to Phyllis Beaulieu, Nunavut Water Board. Subject: Mary River Project, 2BB-MRY0710, Landfill Site Design. Dated: February 13, 2008.

<sup>2</sup> Letter from Mark Dahl, Environment Canada, to Richard Dwyer, Nunavut Water Board. Subject: 2BBMRY0710 Bulk Sampling Program Landfill Design Report. Dated: February 04, 2008.

<sup>3</sup> Letter from David W. Abernethy, Indian and Northern Affairs, to Richard Dwyer, Nunavut Water Board. Subject: 2BB-MRY0710, Baffinland Iron Mines Corporation, Qikiqtani Region, Landfill Site Design Report. Dated: Monday, June 23, 2008

<sup>4</sup> Baffinland Iron Mines Corporation, Mary River Project Bulk Sampling Program, Landfill Design and Operations (Reference No. NB102-00181/10-6).

**Baffinland Iron Mines Corporation**

Suite 1016 120 Adelaide Street West, Toronto, ON Canada M5H 1T1

Tel: +1 (416) 364-8820 • Fax: +1 (416) 364-0193

[www.baffinland.com](http://www.baffinland.com)



- 2) Attachment B: BIM Mary River Project Bulk Sampling Program, Landfill Design and Operations (Reference No. NB102-00181/10-6). This document is taken from Appendix F5 of the March 31, 2008, Water Licence annual report submission.
- 3) Attachment C: Ferguson, Simek Clark Engineers & Architects, 2003. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories. April 21, 2003. Yellowknife, Northwest Territories.

We trust that this submittal satisfies your current requirements. Should you have any questions, please do not hesitate to contact Cheryl Wray or Jim Millard, Environmental Superintendents at 403-450-8843 or by e-mail at [cheryl.wray@baffinland.com](mailto:cheryl.wray@baffinland.com) or [jim.millard@baffinland.com](mailto:jim.millard@baffinland.com).

Best Regards,

**Baffinland Iron Mines Corporation**

Jim Millard  
Environmental Superintendent

cc.  
John Amagoalik, QIA  
Deon Bridge, NWB  
Mark Dahl, Environment Canada  
David W. Abernethy, Andrew Keim, INAC  
David Putnam, BIM

Attach: Attachment A - Response to Reviewers' Comments  
Attachment B – March 2008 Landfill Design and Operations Report  
Attachment C - Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories. April 21, 2003

.

**Baffinland Iron Mines Corporation**

Suite 1016 120 Adelaide Street West, Toronto, ON Canada M5H 1T1

Tel: +1 (416) 364-8820 • Fax: +1 (416) 364-0193

[www.baffinland.com](http://www.baffinland.com)

**ATTACHMENT A**

**Response to Reviewers' Comments**

## 1.0 QIKIQTANI INUIT ASSOCIATION (QIA) REVIEW COMMENTS

1. QIA Comment: QIA was unable to obtain a copy of "Guidelines for the Planning, Design, Operations and Maintenance of Modified Waste Sites in the Northwest Territories" (Guidelines). Thus, QIA requests a copy of these Guidelines are submitted to the NWB and included in the file on the FTP-site.  
BIM Response: A copy of the Landfill Guidelines was included in our March 31, 2008, Water Licence annual report submission to the NWB. A copy of the guidelines is also attached to this information response.
2. QIA Comment: Though it is clear the above mentioned Guidelines were used to develop the Design it is unclear which sections of the Guidelines were considered. Extending further, QIA requests the proponent clearly state the source document, section and page number when cross referencing other documents. In reading the Design it is clear numerous documents have been referenced, directly and indirectly. Thus, adding reference information would clarify for the reader how the proponent draws their conclusions.  
BIM Response: The guidelines<sup>1</sup> and other documents were referenced heavily in our March 31, 2008, Water Licence annual report submission to the NWB and is attached.
3. QIA Comment: The Design states the current active layer thickness on the proposed landfill site is 1m. The document then goes on to state the final cover for the landfill will be 1.5m. QIA requests to know what other considerations were given to determine the depth of the final cover. Furthermore, QIA request to know if the proponent has considered installing thermistors for the landfill. Does the proponent agree that thermistor data could be used during the monitoring stage of the project prior to cessation of post-closure inspections?  
BIM Response: The depth of the final cover was based on typical active layer thicknesses measured elsewhere on the Site. A thermistor installation was not considered for the landfill as the inert waste is not expected to alter the ground temperature significantly. A thermistor installed in 2007 near the proposed landfill site for the proposed railway provides information which will be useful for the landfill site. That being said, BIM is not adverse to considering installation and monitoring of a thermistor in the landfill as part of post closure inspection should the need arise.
4. QIA Comment: QIA requests a landfill specific Monitoring Station is added to the list found under Part I Section 2 of 2BB-MRY0710.  
BIM Response: Regarding the site specific monitoring station, seepage monitoring locations for the landfill site are discussed in Section 5.0 of the March 31/08 report submission. BIM will work with the INAC Water Resource Officer to establish a downstream landfill surface water monitoring location if warranted.
5. QIA Comment: QIA requests the proponent file an Operations and Maintenance (O&M) Manual within ninety (90) days of the approval of the landfill design.  
BIM Response: An O&M manual was provided as part of the March 31, 2008, Water Licence annual report submission. The O&M manual is presented in Attachment B.

---

<sup>1</sup> Ferguson, Simek Clark Engineers & Architects, 2003. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories. April 21, 2003. Yellowknife, Northwest Territories.

6. QIA Comment: QIA requests that final as-built designs, signed by a qualified professional are submitted to the NWB within ninety 90 days of completion.  
BIM Response: QIA will be provided with the same as-built documentation that is specified in our Water Licence and submitted to the NWB within 90 days of facility completion.

## **2.0 ENVIRONMENT CANADA (EC) REVIEW COMMENTS**

7. EC Comment: The Proponent notes that a permanent land fill site is required but then proposes to build a temporary facility. Environment Canada recommends that any facility constructed for the bulk sampling program be sited and constructed with sufficient capacity to be used for the longer term Mary River mine should it ever be built.  
BIM Response: The landfill will be constructed with sufficient capacity for expansion as required.
8. EC Comment: The Proponent discusses monitoring at various points during the Report but there is no discussion of how the monitoring data would be used to manage the land fill. Environment Canada recommends that the Proponent provide information on how the monitoring data will be used to inform site management decisions.  
BIM Response: Section 5.4.8 of the O&M manual states that Management will review records of routine inspections and monitoring to ensure the Operator is fulfilling obligations. In the event any items of note are identified, BIM will take further action in the form of additional monitoring or appropriate corrective action.
9. EC Comment: In section 2.7 the Proponent states that “In coarser overburden with limited organic cover, the thickness of the active layer is anticipated to vary between 1.5 and 2.5 m based on a review of preliminary thermistor data collected in 2007.” The Proponent then goes on to state in section 3.3 that “In order to achieve permafrost encapsulation in the landfill site, the final cover will be thicker than the active layer. Based on an active layer approximately 1 m thick, the final cover will be 1.5 m thick.” Given that the aim is for permafrost to encapsulate the material and that the active layer is potentially 2.5 meters deep it is unclear why then the final cover on closure would be limited to 1.5 meters. Environment Canada requests clarification of this apparent contradiction.  
BIM Response: This is explained in Section 2.7 of the attached report (refer to Appendix B).
10. EC Comment: In Section 3.5 the Proponent states that “If it is determined that fencing is required, a temporary snow fence will be installed for operations.” It is unclear what criteria will be used to determine if fencing is required. Snow fence is designed to generate snow drifts, in the arctic changes to the snow pack can result in impacts on the underlying permafrost. Environment Canada requests that the proponent describe what criteria will be used to determine if fencing is required and recommends that, should fencing be necessary, the appropriate type be utilized.  
BIM Response: Drifting of snow in the arctic environment can present major challenges to operating a facility such as a landfill. The installation of snow fences can reduce the reliance on snow removal activities and allow for improved access and operations for the landfill. The development of snow drifts downwind of infrastructure is commonplace throughout the arctic. BIM considers that snow drifting due to project infrastructure to be a negligible concern for the Mary River Project as related to potential permafrost degradation. It is BIM’s intention to install landfill fencing as required and appropriate to encountered conditions.

11. EC Comment: In Section 5.1 the Proponent indicates that an operations and Maintenance Manual will be completed. Environment Canada requests the opportunity to review/comment on the document prior to site operations.  
BIM Response: An operations and maintenance manual was included as Section 5.0 of the March 31, 2008, Water Licence annual report submission to the NWB. This report is attached (refer to Attachment B).
12. EC Comment: In Section 5.3.5 the Proponent states that “It is expected that the active layer will progress into the landfill waste and cover material” however the proponent only plans to monitor ground warming by observing visual cues such as soil creep. Environment Canada suggests that the proponent utilize a more sensitive method of assessing soil temperature such as thermistors so that any problems can be detected early and remedial action taken.  
BIM Response: See BIM response to QIA Response No. 3.
13. EC Comment: The Proponent states that the waste will be inert and thus not be an attractant for wildlife. All project personnel should receive training on proper waste management to ensure that no food wastes and other wildlife attractants inadvertently end up in the landfill.  
BIM Response: Training will be provided to all personnel as stated in the Operations and Maintenance Manual presented in Section 5.2.1 of Attachment B.
14. EC Comment: The Proponent does not view prevention of windblown debris as an issue because waste will either be too heavy to blow away (i.e. scrap steel) or will consist of ashes that will be placed into containers prior to being brought to the landfill site. However, the Proponent should be careful to not underestimate the strength of the wind in the Arctic. It is not unusual to have winds in the Arctic that exceed 50 km/hr and severe wind-storms with even greater wind speeds. Wind gusts can exceed 100km/hr. The Proponent should ensure that waste is either heavy enough or secure enough to withstand any extreme wind storms than might occur in the area. For example, containers with ash should be a minimum size and filled to a minimum level to ensure they do not blow away in a wind storm.  
BIM Response: BIM shares EC’s concern about the potential for windblown debris and will implement required actions to minimize the potential for windblown debris.

### **3.0 DEPARTMENT OF INDIAN AND NORTHERN AFFAIRS CANADA (INAC) REVIEW COMMENTS**

15. INAC Comment: The Licensee should submit a stand-alone Operations and Maintenance Plan specific to the proposed Bulk Sampling Program Landfill Site. This Plan should be prepared in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories, 1996*, as specified in Part D, Item 19 of the 2BB-MRY0710 licence.  
BIM Response: The requested Operations and Maintenance Plan was submitted on March 31, 2008, as an appendix within the Water Licence annual report. This document is provided in Attachment B of the submission herein.
16. INAC Comment: A surveillance network program (SNP) site should be established to collect runoff from the proposed non-hazardous waste landfill for water quality data analysis, should it be constructed. The INAC Inspector and the proponent should discuss the final selection of the SNP location(s) and inform the Board. This site should be sampled monthly during periods of observed flow and include the following sample parameters: BOD5, pH

Conductivity, Total Suspended Solids, Ammonia, Total Nitrogen Total Nickel, Nitrate-Nitrite, Oil and Grease, Total Phenols, Total Alkalinity, Total Hardness, Calcium, Magnesium, Potassium, Sodium, Sulphate, Total Arsenic, Total Cadmium, Total Copper, Total Chromium, Total Iron, and Total Lead.

BIM Response: BIM will work with the INAC Inspector on this matter.

17. INAC Comment: INAC understands that the Licensee must provide as-built plans and drawings, stamped and sealed by a professional engineer registered in Nunavut, within ninety (90) days of completion of all constructed works, such as the proposed non-hazardous waste landfill. This is in accordance with Part J, Item 4 of the 2BB-MRY0710 licence.

BIM Response: No response required.

#### **4.0\_NUNAVUT WATER BOARD (NWB) REVIEW COMMENTS**

18. NWB Comment: BIM should respond to all issues raised by INAC, EC and the QIA in their submitted comments.

BIM Response: See above responses.

19. NWB Comment: A detailed discussion on how the drainage creek located on the proposed site of the landfill (which can be seen on the reference drawing entitled "Site General Arrangement") will be dealt with such that the landfill stability will be maintained and leachate from the landfill will not reach the stream/creek.

BIM Response: The area in question drains to Sheardown Lake - drainage will be directed around the landfill (to prevent contact of water and waste), and seepage/surface water monitoring will be undertaken. Drainages in the area are typically dry or frozen for most of the year. There are no anticipated stability issues associated with this infrastructure.

20. NWB Comment: A detailed plan for monitoring if leachate from the landfill is entering the surrounding environment and shall include the timing, location and parameters for sampling.

BIM Response: BIM will work with the inspector to ensure that the monitoring plan is adequate for the detection of leachate entering the receiving environment. This was discussed in comment no. 16.

21. NWB Comment: The proponent shall ensure that air blown debris from the landfill does not enter into waterways or otherwise impact water quality.

BIM Response: We are in agreement with this comment.

22. NWB Comment: A plan that identifies how ponding on the surface of the landfill and leachate run-off will be prevented.

BIM Response: This is discussed in Section 3.7.1 of the Landfill Design Report.

23. NWB Comment: Submission of a stand alone, site-specific Operation and Maintenance manual for the landfill including all the information specified in section 5.3 of the submitted Landfill Site Design Report.

BIM Response: An O&M report was submitted as Section 5 within the Landfill Design document submitted as an appendix within the Water Licence annual report submitted on March 31, 2008. This document is provided herein as Attachment B. At the NWB's request, BIM will submit Section 5.0 of this document as a stand alone report.