



STAFF REPORT

Company: BHP Billiton Diamonds Inc. (BHPB)	
Location: Ekati Diamond Mine	Water Licenses: MV2001L2-0004; MV2001L2-0008; MV2003L2-0013 and MV2002L2-0002
Date Prepared: December 13, 2006	Meeting Date: December 19, 2006
Subject: Review comments on the proposal to amalgamate Type B water licenses for road watering into Type A water licenses	

1. Purpose/Report Summary

The purpose of this staff report is to present to the Board the review comments received on the proposal made by Board staff to regulate the road watering activities, currently licensed under the Type B water licenses, under BHPB's Type A water licenses.

Specifically, this report is provided to assist the Board in making rulings on the following three questions related to the amalgamation of the licenses:

- a) Are the road watering activities regulated under the Type B water licenses within the scope of the Type A water licenses?
- b) Do the conditions of the Type A water licenses allow for the road watering activities currently regulated under the Type B water licenses?
- c) Do the conditions of the Type A water licenses ensure the protection of affected waters to an equal or greater extent than the existing Type B water licenses?

2. Background

At the last Board meeting, Board staff proposed an alternative regulatory approach for the road watering activities currently regulated by two Type B water licenses (MV2001L2-0004 and MV2002L2-0002). These Type B licenses allow freshwater to be withdrawn and applied to roads for dust control. The alternative regulatory approach involves the cancellation of the Type B water licenses and the regulation of the road watering activities under the Type A water licenses, a more stringent type of license. The Board agreed to consider this approach.



STATISTICS

Probability and Statistics

When the sample size is large, the distribution of the sample mean is approximately normal with mean μ and variance $\frac{\sigma^2}{n}$.

The standard deviation of the sample mean is $\frac{\sigma}{\sqrt{n}}$.

Central Limit Theorem: If X_1, X_2, \dots, X_n are independent and identically distributed random variables with mean μ and variance σ^2 , then the distribution of the sample mean \bar{X} approaches a normal distribution with mean μ and variance $\frac{\sigma^2}{n}$ as $n \rightarrow \infty$.

Probability

The probability of an event occurring is a number between 0 and 1. The probability of the complement of an event is 1 minus the probability of the event.

Two events are independent if the occurrence of one event does not affect the probability of the other event occurring.

Two events are mutually exclusive if they cannot occur at the same time.

The probability of the union of two events is the sum of their probabilities minus the probability of their intersection.

The probability of the intersection of two events is the product of their probabilities if they are independent.

Statistics

Statistics are numerical measures that describe the characteristics of a data set. Descriptive statistics summarize the data, while inferential statistics use the data to make inferences about the population. The most common measures of central tendency are the mean, median, and mode. The most common measures of dispersion are the range, variance, and standard deviation.

The process for considering this approach involves a number of steps, the first being the solicitation of input from stakeholders on the three factors that must be satisfied in order for the Board to proceed with cancelling the licenses. The three factors are:

- the road watering activities must be within the scope of the Type A water licenses
- the conditions of the Type A water licenses must allow for the road watering activities to occur
- the conditions of the Type A licenses must ensure the protection of affected waters to an equal or greater extent than the existing Type B licenses.

Input was solicited from stakeholders by way of a letter signed by the Chair that outlined the proposed alternative regulatory approach and the background for the three factors listed above. The comment deadline was set for December 15, 2006.

3. Review Comments

Although no written comments were received to date, I spoke with Sean Kollee of the Independent Environmental Monitoring Agency and with Anne Wilson of Environment Canada. Both indicated that they support the alternative regulatory approach.

Any comments received following the submission of this staff report will be provided to the Board at the meeting.

4. Conclusion

There appears to be no concerns with either the proposed regulatory approach or the three factors for consideration.

5. Recommendation

I recommend that the Board rule that all three factors are satisfied and proceed to the next step in the process for considering this regulatory approach. The next step, if the Board rules that the three factors are satisfied, is to notify all parties of the Board's ruling and to request that BHPB notify the Board whether or not the company wishes to proceed with the cancellation of the licences.

If BHPB agrees to proceed with the cancellation of the Type B licences, a public hearing will have to be advertised. If BHPB disagrees, BHPB will submit a renewal application for WL MV2001L2-0004 within 60 days of their notification.

6. Attachments

- Excerpts from my last staff report on this issue (November 30, 2006) that provide further detail on the three factors for consideration.

Respectfully submitted,



Sarah Baines
Technical Coordinator

The process of determining the structure of the system is a complex task that involves a deep understanding of the system's requirements and the underlying hardware. This process is often iterative and involves a lot of communication between the system designers and the hardware engineers.

- The first step in the process is to define the system's requirements. This involves identifying the system's purpose, its intended users, and the environment in which it will be used.
- The next step is to determine the system's architecture. This involves deciding on the system's overall structure, including the number of processing units, the type of interconnections, and the system's control logic.
- The final step is to design the system's hardware. This involves creating a detailed schematic diagram of the system, which shows the individual components and their interconnections.

The design of the hardware is a complex task that involves a deep understanding of the system's requirements and the underlying hardware. This process is often iterative and involves a lot of communication between the system designers and the hardware engineers.

Hardware Design

Hardware design is the process of creating a physical system that can perform a specific task. This process involves a deep understanding of the system's requirements and the underlying hardware. The hardware design process is often iterative and involves a lot of communication between the system designers and the hardware engineers.

Conclusion

The design of a hardware system is a complex task that involves a deep understanding of the system's requirements and the underlying hardware. This process is often iterative and involves a lot of communication between the system designers and the hardware engineers.

References

1. "Hardware Design: A Systematic Approach." *IEEE Transactions on Computers*, vol. 38, no. 1, pp. 1-10, 1989.

2. "Hardware Design: A Systematic Approach." *IEEE Transactions on Computers*, vol. 38, no. 1, pp. 1-10, 1989.

3. "Hardware Design: A Systematic Approach." *IEEE Transactions on Computers*, vol. 38, no. 1, pp. 1-10, 1989.

Appendix

The following table provides a summary of the hardware design process. It is intended to provide a high-level overview of the process and is not intended to be a substitute for a detailed design document.

Hardware Design

1. Introduction

2. System Requirements

EXCERPTS FROM MY NOVEMBER 30, 2006 STAFF REPORT

Proposed Regulatory Approach

With the goal of more effectively regulating water use and waste disposal at the Ekati Mine, Board staff proposes to regulate road watering activities under the provisions of BHPB's two Type A water licences:

- The Sable Haul Road watering activities under Water Licence MV2001L2-0004 would be regulated through a drawdown plan in accordance with part E, item 2 of Water Licence MV2001L2-0008ⁱ (the Sable, Pigeon, Beartooth expansion licence).
- The Misery Haul Road watering activities under Water Licence MV2002L2-0002 would be regulated through a drawdown plan in accordance with part D, item 1 of Water Licence MV2003L2-0013ⁱⁱ (the main licence).

Implementing this approach would require the cancellation of the two Type B licences under the provisions of section 18(1)(c)(iii) of the *Northwest Territories Waters Act*, followed by BHPB's submission of the two drawdown plans described above. The drawdown plans would be subject to stakeholder review and would require approval by the Board before activities commence.

Factors for Consideration

For the Board to proceed with this approach to regulating road watering activities, it must be satisfied that the activities are within the scope of the corresponding Type A water licence; that the conditions of the corresponding Type A water licence allow for the activities; and that the conditions of the Type A licences ensure the protection of affected waters to an equal or greater extent than the existing Type B licences.

A) Scopes of the Type A water licences

The scopes of the two Type A water licencesⁱⁱⁱ both allow for the use of water for activities associated with diamond mining and milling in specific watersheds. The Board recognizes that the Misery and Sable haul roads and associated water intake structures cross areas between these watersheds, however, the road watering activities were assessed in the 1995 Environmental Impact Statement for the main licence^{iv} and the 2001 Environmental Assessment Report for the expansion licence^v.

B) Type A water licence conditions

Sable Haul Road: Road watering is a recognized use of water under part D, item 1 of Water Licence MV2001L2-0008 which states that BHPB "...shall obtain water for road watering and associated uses from Two Rock Lake Sedimentation Pond...or as otherwise approved by the Board." This implies that the Board has the flexibility to evaluate other sources of water for the watering of the Sable Haul Road.

Misery Haul Road: Part C, item 1 of Water Licence MV2003L2-0013 states that BHPB "...shall obtain water for domestic purposes, processing and associated uses from Grizzly Lake, Little Lake,...or as otherwise approved by the Board." This implies that the Board has the flexibility to evaluate other sources of water for the watering of the Misery Haul Road.

C) Protection of affected waters

If this regulatory approach is adopted, the road watering activities would be subject to all conditions of the Type A licences and would have to be carried out in accordance with the approved drawdown plans.

Department of Chemistry

1. The first step in the synthesis of the target molecule is the reaction of the starting material with the reagent to form the intermediate.

2. The second step involves the reaction of the intermediate with the reagent to form the product.

3. The final step is the purification of the product by recrystallization from a suitable solvent.

4. The yield of the product is approximately 85% based on the starting material.

Experimental Procedure

1. Weigh out 10.0 g of the starting material and transfer it to a 100 mL round-bottom flask.

2. Add 50 mL of the solvent to the flask and stir the mixture at room temperature for 1 hour.

3. Add 5.0 g of the reagent to the mixture and stir for 2 hours.

4. Filter the mixture and wash the residue with 10 mL of the solvent.

5. Recrystallize the product from a mixture of the solvent and water.

ⁱ Part E, item 2 of Water Licence MV2001L2-0008 reads as follows:

Prior to the commencement of dewatering or draw-down of and lakes, the Licensee shall submit to the Board for approval, a Dewatering Plan for each lake that shall include, but not be limited to, the following information:

- a) *volume of water to be dewatered from each source;*
- b) *the expected quality of water to be discharged to the receiving environment;*
- c) *a schedule for dewatering and daily discharge rates;*
- d) *pumping methods including locations of intake and outflow structures;*
- e) *the design of any erosion protection structures in the discharge areas;*
- f) *the description of procedures for visual inspections of any erosion along the affected water course;*
- g) *the frequency and locations for water quality monitoring as referred to in the "Surveillance Network Program";*
- h) *the frequency, location and procedures for monitoring flow rates in the discharge stream;*
- i) *the design of pipeline and related facilities;*
- j) *the procedures and rates for dewatering during the winter months to minimize erosion of the downstream watercourses, adjacent shorelines and damage to fish habitat; and*
- k) *the identification of any treatment that may be used to ensure that effluent quality criteria are met, in accordance with Part G, Item 11(d).*

ⁱⁱ Part D, item 1 of Water Licence MV2003L2-0013 reads as follows:

Prior to the commencement of Dewatering or Drawdown of any natural water bodies, excluding the Drawdown of Grizzly Lake, Little Lake and Thinner Lake (Misery Camp), the Licensee shall submit to the Board for approval, a Dewatering or Drawdown Plan for each water body that shall include, but not be limited to, the following information:

- a) *volume of water produced by Dewatering or Drawdown of each water body;*
- b) *a schedule for Dewatering or Drawdown and maximum pump rates;*
- c) *pumping methods including locations of intake and outflow structures;*
- d) *the design of any erosion prevention structures in the areas where water or Waste is discharged;*
- e) *the description of procedures for inspecting any erosion along the affected watercourse;*
- f) *a description of and mitigation measures for any predicted hydrological or water quality impacts to downstream water bodies;*
- g) *the schedule and locations for water quality monitoring;*
- h) *the frequency, location and procedures for monitoring flow rates in the discharge stream and in the receiving water body;*
- i) *the design of any pipelines and related facilities; and*
- j) *the procedures and rates for Dewatering or Drawdown to minimize erosion of downstream water bodies and adjacent shorelines, and, in winter, damage to spawning habitat from the development of icings, overflows or glaciation.*

ⁱⁱⁱ Scope of Water Licence MV2001L2-0008

*This Licence entitles BHP Billiton Diamonds Inc. to use water, dewater Sable, Pigeon, and Beartooth Lakes for the purpose of mining, to drawdown Two Rock Lake, divert Pigeon Stream around the Pigeon Pit, pipe water from Bearclaw Lake outflow around Beartooth Pit, use water from Ursula and Upper Exeter Lake, deposit processed kimberlite into the Beartooth Pit for the purpose of creating a pit lake, and dispose of waste for industrial undertakings in diamond mining and milling production and associated uses in the **Koala, Pigeon and Sable Watersheds**, Northwest Territories as shown on Figure 6, 8 & 10 of the Class A Water Licence and Land Use Permits supporting document, submitted August 21, 2001... [emphasis added]*

Scope of Water Licence MV2003L2-0013

*This Licence entitles BHP Billiton Diamonds Inc. (the Licensee) to divert water from Upper Panda Lake to Kodiak Lake, and to use water and dispose of Waste for the purpose of mining the Panda, Koala, Koala North, Misery and Fox kimberlite pipes and for operating the processing facilities and infrastructure associated with diamond mining within the **Koala, Misery, King-Cujo and Desperation-Carrie Watersheds of the Lac de Gras basin**, Northwest Territories. [emphasis added]*

The activities listed above are to be conducted as described in the 1994 NWT Diamonds Project Description which was assessed in the 1995 Environmental Impact Statement, as subsequently amended through approvals by the Board during the term of Water Licence N7L2-1616, and as described in the Water Licence Renewal Application.

^{iv} Volume 3, Section 6.4 in the 1995 Environmental Impact Statement.

^v Section 4.5.3 in the 2001 Environmental Assessment Report.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice to ensure transparency and accountability.

2. The second part outlines the procedures for handling discrepancies. It states that any variance between the recorded amounts and the actual cash flow should be investigated immediately to identify the source of the error and prevent it from recurring.

3. The third part details the process of reconciling the books. It requires that the general ledger be compared against the bank statements on a regular basis to ensure that the two records match. Any differences should be explained and corrected promptly.

4. The fourth part describes the role of the internal audit function. It is responsible for conducting periodic reviews of the financial records to assess the effectiveness of internal controls and to identify any areas of weakness that need to be addressed.

5. The fifth part discusses the importance of segregation of duties. This principle ensures that no single individual has control over all aspects of a financial transaction, which helps to reduce the risk of fraud and errors.

6. The sixth part covers the requirements for the preparation of financial statements. It specifies that these statements must be prepared in accordance with the relevant accounting standards and should be reviewed by a qualified professional before being presented to the management and the board of directors.

7. The seventh part addresses the issue of confidentiality. It stresses that all financial information is considered sensitive and should be shared only with those who have a legitimate need to know. Appropriate security measures should be implemented to protect this data from unauthorized access.

8. The eighth part discusses the importance of staying up-to-date with changes in tax laws and regulations. It advises that the accounting system should be regularly updated to reflect these changes to ensure that the company remains in full compliance with all applicable laws.

9. The ninth part covers the process of archiving financial records. It requires that all records be stored securely and for a sufficient period of time to allow for future audits and investigations.

10. The tenth and final part summarizes the key points of the document and reiterates the commitment to maintaining the highest standards of financial integrity and transparency.