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Your file - Votre référence
2AM-DOH
Our file - Notre référence
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December 8, 2006

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Sent via email

Re: 2AM-DOH - Miramar Hope Bay Limited - Doris North Project - preliminary review

Indian and Northern Affairs Canada (INAC) has conducted a preliminary review of Miramar Hope Bay Limited's (MHBL) Class A water licence application for its Doris North Project with the aim of determining whether the provided information satisfies the requirements of:

1. the Nunavut Water Board (NWB) guidelines;
2. the Nunavut Impact Review Board (NIRB) Project Certificate;
3. the INAC comments to the NIRB Draft Project Certificate; and
4. the INAC intervention to the NIRB Public Hearing.

Specialist advice has been provided concerning the completeness of the submitted licence application in accordance with INAC's mandated responsibilities for the enforcement of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NW&NSRT), *Arctic Waters Pollution Prevention Act* (AWPPA), and the *Department of Indian Affairs and Northern Development Act* (DIAND Act).

INAC's technical team is providing specialist advice for this initial review on: surface water use, wastewater treatment, tailings containment, jetty design, and cumulative water quality and quantity effects associated with the proposed project. Indian and Northern Affairs Canada believes that this is a preliminary review as an initial component of the regulatory review process and that detailed project design and operating information will be addressed in a subsequent technical review and public hearing.

Indian and Northern Affairs Canada considers the submitted water licence application to be complete. However, additional information will be required on several issues to ensure a proper technical review. Indian and Northern Affairs Canada recommends that a technical hearing be held prior to the technical review submission dead-line to allow interveners and the proponent an opportunity to address various concerns regarding the submitted licence application's content.

Annexed to this letter are summaries of the preliminary review, of issues to be resolved and of technical issues that INAC recommends the proponent address in additional information to the water licence application. Should you have any questions, please contact Jim Rogers, Manager of Water Resources at (867) 975-4550 or Spencer Dewar, Manager of Land Administration at (867) 975-4280.

Sincerely,

Carl McLean
Director of Operations

Enclosure: Annex A
Annex B
Annex C

cc Miramar Hope Bay Limited

Annex A: Summary of Preliminary Review

Indian and Northern Affairs Canada and its technical team have identified a number of issues which should be resolved prior to performing a full technical review of the Doris North Project's water licence application as follows:

1. Geotechnical Characterization of Sulphide Leach Residue
   Through a proposed change to the ore processing method, some tailings that are cyanide leached are proposed to be placed in the underground mine. This change in approach has not been supported in the documentation by geochemical characterization of the leach residue or a description of potential management implications.

2. Adaptive Management Plan
   An Adaptive Management Plan to prevent and mitigate shoreline erosion was a commitment by MHBL to be provided as part of the regulatory approvals phase but has not been provided.

3. Doris Creek Water Quality Criteria
   MHBL provides a general statement of their commitment to achieve Canadian Council of Ministers of the Environment (CCME) guidelines in Doris Creek but do not provide a list of specific values that would benefit a technical review.

4. Doris Creek Water Quality Criteria
   MHBL has proposed a major change to the proposed copper criteria in Doris Creek that should be resolved immediately and, if necessary, assessed.

5. Water Balance / Mass Loading Model
   MHBL was directed by the NIRB to update the site water model with current baseline data; MHBL chose to provide a rationale as to why this was not necessary which INAC considers to be inadequate. INAC recommends that MHBL update its project's water balance / mass loading model.

6. Water Laboratory Quality Assurance / Quality Control (QA/QC) Plan
   MHBL proposes that information required for a full review of its QA/QC Plan be provided at a later date. INAC suggests the this information be addressed in the licence application's technical review.

7. Investigations for Final Design of Dams
   Several information items that were agreed to by MHBL as required

for final dam designs have not been provided.

8. Landfarm

Detailed information on water balance and water release procedures are not provided.

Specific concerns and recommendations regarding each of these issues follows in Annex B.

In addition to the above concerns with the present water licence application, three technical deficiencies were identified in the INAC preliminary review. These deficiencies, which are described later in this letter, are not considered sufficient to prohibit the start of a technical review. However, these technical deficiencies and those which may surface in INAC's upcoming technical review should be resolved prior to the end of the water licence hearing .

Annex B: Issues to be Resolved Prior to Performing a Full Technical Review

Issue #1, Geochemical Characterization of Sulphide Leach Residue

MHBL has proposed a change to the ore processing method, as compared to the ore processing method that was reviewed through the Environmental Assessment. At one stage of the gold recovery process, a sulphide floatation product is leached with cyanide to retrieve additional gold.

Previously, MHBL proposed that high sulphide leach residue solids would be disposed of in Tail Lake along with the rest of the process tailings as a single stream. The leach water and solids, in that case, were to be treated for cyanide destruction and metals removal using the "CARO's acid" method, prior to release in Tail Lake.

MHBL now proposes that high sulphide leach residue solids be filtered and rinsed in the mill and then placed into the underground mine, where the cake is anticipated to freeze into permafrost for long term disposal. The rinse solution would be largely recycled within the mill. A portion of the leach solution removed to allow the input of fresh solution would be treated with the "CARO's acid" method and released to Tail Lake with the tailings (MHBL Support Document, October 2006, page 3).

MHBL states that this change is a means of reducing impacts and risks to Tail Lake. INAC's concern that a full understanding of the potential risks, or benefits, of this proposed change to the project cannot be ascertained from the submitted documentation. Specifically, INAC suggests that the following information be provided as a means of allowing a technical review:

a) description of the filter/rinse procedure which includes an assessment of its effectiveness in removing residual cyanide;
b) geochemical characterization for the filtered/rinsed leach residue solids that would allow for an assessment of potential runoff or leach water quality in the short term (i.e., possible temporary storage on surface) or long term (i.e., in the underground mine); this is needed not only because of the potential for residual cyanide in the solids but also because of the high sulphide content and (assumed) potentially acid generating nature of the tailings;
c) description of how the filtered/rinsed leach residue is proposed to be handled for temporary storage on surface if a suitable disposal location underground is not immediately available; and
d) factor this change into the site water balance/mass loading model to demonstrate the effects, if any, (positive or negative) to the receiving environment.

Issue #2, Adaptive Management Plan for Potential Shoreline Erosion at Tail Lake

MHBL committed to providing an Adaptive Management Plan to prevent and mitigate shoreline erosion as part of the regulatory approvals phase. This plan is necessary so a technical review of the proposed project can ensure that detailed plans are in place to properly monitor for and react to different rates and scale than anticipated shoreline erosion at Tail Lake.

MHBL provided some information relevant to an adaptive management plan in various sections of the application document (S10, Section 5 and S10l, for example). However, a formal adaptive management plan. with implementation triggers, was not identified in the application documents. Submitted information was reviewed as part of this initial review and is found to be deficient in several important areas:

a) triggers for adaptive management responses;
b) method for assessing monitoring information against triggers; and
c) process for developing specific mitigation measures.

Issue #3, Doris Creek Water Quality Criteria

Through the Environmental Assessment (EA) process, MHBL committed to two levels of water quality criteria as part of their proposed effluent strategy: criteria for water released from Tail Lake, and criteria for water in Doris Creek (at the end of the mixing zone).

In the current application, MHBL references the general commitment to the Canadian Council of Ministers of the Environment (CCME) water quality guidelines but does not provide a list of the specific criteria per parameter that they commit to achieving in Doris Creek.

INAC suggests that MHBL provide such a list of specific values to make their commitment clear for regulatory permits.

Issue #4, Doris Creek Copper Criteria

During the EA process, the assessment of effects in the aquatic environment was clearly based, and verified on a number of occasions, on achieving the Canadian Environmental Quality Guidelines (CEQG) for the Protection of Freshwater Aquatic Life, as published by the CCME, in Doris Creek. This was a firm commitment from MHBL that is contained in the NIRB Project Certificate.

At the NIRB Public Hearing, INAC (per Eric Denholm of Gartner Lee) specifically

confirmed that this commitment was in reference to the generic CEQG values, such as the hardness-based value for copper, and not to site-specific calculations or variants of those values. This confirmation occurred throughout the EA process because MHBL had initially proposed, and later withdrew, a proposal for site-specific copper criteria that was higher than the generic value. The proponent clearly confirmed that the site-specific objective was used only for risk assessment purposes and, as a result, was never assessed as part of the EA process.

The CEQG allow for the derivation of site-specific criteria in certain situations but MHBL clearly withdrew this aspect of their proposal. For this reason, the initially proposed site-specific copper criteria did not undergo a technical review and was not included in an assessment of effects to the receiving aquatic environment.

In the current application, MHBL has changed their proposal to now use the site-specific objective for copper to manage the effluent discharge strategy. This is a deviation of the project that was assessed through the NIRB process and, in INAC's view, is a major issue for the project at this stage. INAC strongly recommends that this be clarified with MHBL, and perhaps the NIRB, before the technical review proceeds.

In the event that the site-specific criteria for copper is to be adopted for Doris Creek, INAC's initial recommendations are:

a) MHBL should update the 2004 derivation, with the more recent data collected in 2005 and 2006;
b) the updated derivation should undergo a rigorous and transparent technical review;
c) MHBL should update the assessment of effects in the aquatic environment; and
d) the updated assessment of effects should be rigorously reviewed.

Issue #5, Water Balance/Mass Loading Model

The NIRB Project Certificate required the continued collection of baseline environmental data (water quality, hydrometric, and climatic) and to update the site water balance/mass loading model with the more recent data. INAC had stressed the need for an updated model to the NIRB at the time because the project assessment was conducted on only one effective year of baseline water quality data and a short period of hydro-climatic data, which was considered to be borderline minimal for this project.

MHBL did not update the water quality model in the current application but, rather, provided a rationale as to why updating and re-running the model was not necessary. In support document S6, MHBL provides an assessment of the 2005 and 2006 water quality data and provides a rationale for why the assumptions made using the 2004 data are justified. The justification is primarily based on copper concentrations.

INAC's review of this rationale finds it to be inadequate and, as a result, recommends that MHBL update the water quality model as was initially directed by the NIRB, based on the strong recommendations of INAC and other parties. INAC feels that an updated model be required before the application's technical review can proceed.

INAC's recommendation is based largely on the same rationale that was presented to the NIRB at the time of the Environmental Assessment. One year of useable baseline water quality data is inadequate for characterizing site conditions and demonstrating that the proposed effluent discharge strategy can be implemented and regulated with confidence. INAC recommended and the NIRB specifically required MHBL to continue the baseline data collection programs after completion of the NIRB process. INAC's recommendation at this time is further supported by the following:

a) all the data should be included in the model, including 2005 and 2006, not only because it was asked for but to ensure that the model adequately reflects actual site conditions. This is particularly important for the assessment of trends in water quality data, especially for other parameters such as chromium and selenium, given the proponent's commitment to meet CCME in the receiving environment for all parameters, not only copper. Re-running the water balance / mass loading model will allow for the identification of any other parameters that could constrain the proposed discharge scenario;

b) the additional climatic and hydrometric data and the effect of winter ice accumulation on available storage may affect the site water balance (review of the insert model as well); the rationale in Support Document S6

appears to be based solely on water quality, specifically metal/copper concentrations;

c) the proposed change to the handling of cyanide leach residue (solids and filter/rinse water) in the process plant should be incorporated into the site water model; and

d) the proposed effluent discharge criteria are higher than values that have been previously included in the water model.

Issue #6, Water Laboratory QA/QC Plan

MHBL has provided a Quality Assurance / Quality Control Plan, as required by the NIRB, for the operation of an on-site water laboratory. The plan does not include procedures for initial start-up and operation of the laboratory equipment, as was required by the NIRB.

MHBL recognizes this omission and has proposed that this information be provided at a later date prior to the start of mine operations. INAC recommends that this information should be provided in time to be incorporated into the technical review of other information related to the on-site water analysis laboratory.

Additionally, MHBL has proposed that it test metals on-site and other parameters (such as cyanide, nitrite and ammonia, for example) off-site. The results of the off-site analyses will not be known for a period of several days. MHBL proposes to conduct a quick check that "off-site" parameters are in compliance pending the receipt of results from an off-site laboratory. This analysis procedure entails the use of numerical relationships which relate metal concentrations with typical concentrations of these other parameters. However, MHBL has not provided a description of how this procedure will take place. INAC suggests that MHBL should develop and provide a description of this analysis procedure for its licence application's technical review.

Issue #7, Investigations for Final Design of Dams

MHBL has provided engineering design information for the water retention dams at Tail Lake. However, several omissions will prevent a full technical review of this information. As part of the NIRB Environmental Assessment and Public Hearing, a specific checklist of information items that would be required for final design of the dams was developed by INAC and accepted by MHBL. Several items from this checklist were not identified in the current application documents which are outlined as follows:

a) details on calibration of the thermal model;
b) site investigations upstream and downstream of the dam centerlines; and
c) laboratory strength testing of foundation soils.

This information is required, in INAC's opinion, to conduct a technical review of the application.

Issue #8, Landfarm

MHBL has proposed that a landfarm facility be located in Quarry #2, adjacent to the landfill and has provided a facility design and operating plan for review. The plan proposes to collect and filter water that comes into contact with hydrocarbon-contaminated soils and then to release treated water onto the tundra.

However, the plan does not provide an estimate of the water balance, water volumes, or specific details of water release to the tundra. INAC suggest that MHBL be required to provide these details for the technical review.

Annex C Technical Deficiencies

As described above, the following three technical deficiencies were identified INAC anticipates that additional technical deficiencies will be identified throughout its technical review of the water licence application.

1. Water Quality Monitoring
   The proposed Water Quality Monitoring Program does not address all of the requirements of the NIRB Project Certificate or of INAC's recommendations to NIRB.

2. Construction ML/ARD Monitoring Plan
   The proposed plan does not address all of the requirements of the NIRB Project Certificate or of INAC's recommendations to NIRB.

3. Operations ML/ARD Monitoring Plan
   The proposed plan does not address all of the requirements of the NIRB Project Certificate or of INAC's recommendations to NIRB.

Technical Deficiency #1, Water Quality Monitoring

As compared to INAC's recommendations to the NIRB (January 2006, water quality model and use of conservative assumptions) that did not specifically appear in the NIRB Certificate, the following omissions from the water quality monitoring program have been identified and should be provided prior to the completion of a full technical review. INAC feels this information is necessary to adequately complete our technical assessment.

a) cold temperature kinetics of nitrification;
b) tailings pore water gradient diffusion;
c) effluent from cyanide treatment plant (current plan only addresses testing of tailings once all stream applied); and
d) oxygen consumption in Tail Lake.

Technical Deficiency #2, Construction ML/ARD Monitoring Plan

The NIRB Project Certificate (item 18; FEIS Final Hearing, Appendix A, Water Quality, item 3; FEIS Final Hearing, Appendix A, Jetty, item 1) requires the submission of a program detailing the methodology for testing quarried rock for acid generation and metal leaching potential. Since jetty material will come from the quarry, this issue includes the jetty. Although MHBL states that 100 additional samples will be taken for quarry material characterization, the characterization program does not:

a) address how metal leaching will be characterized; and
b) address appropriate methods to assess effective NP (January 2006 INAC submission to NIRB, Characterization of Quarry Materials); and
c) provide QA/QC procedures throughout construction for the verification of quarry rock (FEIS Final Hearing Appendix B, INAC/HatchAcres, item 1).

Further, INAC recommended to the NIRB (January 2006, Use of Waste Rock for Construction on Surface) that MHBL's proposed option of using waste rock on the project area's surface for unspecified construction purposes should not be considered because the proposed criteria to identify appropriate material was inadequate. In the current application documents, MHBL considers the option of using waste rock for construction but does not include methods of evaluating metal leaching potential in its characterization program.

INAC suggests that these issues require resolution before to the completion of a full technical review.

Technical Deficiency #3, Operations Metal Leachate / Acid Rock Drainage (ML/ARD) Monitoring Plan

The NIRB Project Certificate (Final Hearing Report, Appendix B, INAC item 5) requires the submission of an operational ML/ARD characterization plan. This plan was not identified in the application documents provided by MHBL and should be provided for the technical review.

Several specific requirements for the required operational ML/ARD characterization plan were identified in INAC's recommendations to the NIRB (January 2006, water quality model and use of conservative assumptions, characterization of waste rock, and characterization of tailings) which are described as follows:

a) monitoring of ML/ARD characterization for waste rock materials;
b) monitoring methods proposed to characterize waste rock materials and placement on the temporary storage pad;
c) methods to link waste rock characteristics to final placement in underground locations; and
d) effective buffering capacity of tailings.

Indian and Northern Affairs Canada is appreciative of having an opportunity to provide the above-mentioned comments regarding the completeness of Miramar Hope Bay Limited's Doris North Project water licence application. The Nunavut Water Board is valued for its efforts in ensuring the proper regulation, use, and management of water in the Nunavut Settlement Area. Indian and Northern Affairs Canada looks forward to conducting a technical review of the submitted licence application and working with the Nunavut Water Board throughout its licensing process.