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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

October 30, 2006

Larry Connell, P.Eng.
General Manager, Environment
Miramar Mining Corporation
899 Harbourside Drive, Suite 300
North Vancouver, BC, V7P 3S1

Subject: Preliminary Guidelines - Application for a Water Licence
Doris North Gold Project

Dear Larry:

Please find attached the Preliminary Guidelines for the filing of an application for a water licence for the Doris North Gold Project. These Preliminary Guidelines were prepared by the Nunavut Water Board ("NWB") following consultation with interested parties.

However, please note that these Preliminary Guidelines have been developed without the benefit of a complete and thorough review of an actual application. Therefore, as a first step upon receipt of your application, the NWB will conduct an initial review. In accordance with the NWB rules, we will give interested parties the opportunity to review the application and provide comments to the NWB within a 30-day period. Following this initial assessment, the NWB will determine whether the application is complete, or whether additional information and studies will be required to evaluate all quantitative and qualitative effects of this undertaking, as per section 48 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*.

Once the NWB deems your application complete, notice of a public hearing will be published. The particulars of the hearing, including technical meetings and pre-hearing, will be communicated to you and all parties in due time.

If you have any questions, please contact the undersigned.

Sincerely,

ORIGINAL SIGNED BY

Philippe di Pizzo
Chief Administrative Officer

c.c. Doris North Distribution List



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Nunavut Water Board Preliminary Guidelines for Applicant

Miramar Hope Bay Limited – Doris North Project

Dated: 27 October 2006



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PART A: SPECIFIC INSTRUCTION

1.0 Introduction

The Nunavut Water Board (NWB) is an institution of public Government responsible for the regulation, use and management of water in the Nunavut Settlement Area. According to **Section 11** and **12** of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA) *no person shall use, or permit the use of, waters in Nunavut except in accordance with the conditions of a licence and except in accordance with the conditions of a licence, no person shall deposit or permit the deposit of waste in waters in Nunavut or in any other place in Nunavut under conditions in which the waste, or any other waste that results from the deposit of that waste, may enter waters in Nunavut.* In accordance with NWB's mandate, Miramar Hope Bay Limited (MHBL) filed an application for a water license on **20 March 2002** for the use of water and disposal of waste into water for the proposed Doris North Project.

The application for water license and other permits, authorizations, and/or licenses triggered an environmental screening of the project by the Nunavut Impact Review Board (NIRB). Following screening and an **Article 12, Part 5** Review of Miramar Hope Bay Limited's Environmental Impact Statement, the Minister of Indian and Northern Affairs agreed with the NIRB's recommendations in a letter dated **1 August, 2006**. In reviewing the application submitted by MHBL the Board will consider **Sections 57** and **58** of the NWNSRTA which state the following:

Section 57 *The Board may not issue a licence unless the applicant satisfies the Board that:*

- a) *any waste produced by the appurtenant undertaking will be treated and disposed of in a manner that is appropriate for the maintenance of the water quality standards and effluent standards that are prescribed by the regulations or, in the absence of such regulations, that the Board considers acceptable; and*
- b) *the financial responsibility of the applicant, taking into account the applicant's past performance, is adequate for*
 - i *the completion of the appurtenant undertaking,*
 - ii *such measures as may be required in mitigation of any adverse impact, and*
 - iii *the satisfactory maintenance and restoration of the site in the event of any future closing or abandonment of that undertaking.*



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Section 58 *The Board may not issue a licence unless the applicant, with respect to any person, other than an instream user, who would be entitled to use waters in precedence to the applicant under section 47,*

- a) satisfies the Board that the use of waters or the deposit of waste would have no adverse effects on the use of waters by that person;*
- b) satisfies the Board that any adverse effects caused by the use of waters or the deposit of waste would not be significant, and has paid or undertaken to pay the compensation that the Board considers appropriate to that person; or*
- c) has entered into an agreement to compensate that person for any adverse effects.*

In accordance with the *NWNSRTA Section 48(3)* and **Part 13.8.1** of the *Nunavut Land Claims Agreement (NLCA)*, the NWB has decided to issue directional guidelines to MHBL through this document. The guidelines are based on the NWB requirements outlined in the *NWNSRTA*, the *Northwest Territories Water Regulations* and engineering best practices and principles. The guidelines do not relieve Miramar Hope Bay Limited from confirming and following up on other information requirements which may be required. The Reader is to refer to **Part A: Section 3.0** for a list of additional documents, guidelines, legislation and standards that may be of use to MHBL in preparing the supplemental information. MHBL should understand that through **Sections 70 and 71** of the *NWNSRTA* the Board may develop conditions in a licence as per the following:

Section 70 *(1) Subject to this Act and the regulations, the Board may include in a licence any conditions that it considers appropriate, including conditions relating to*

- a) the manner in which waters may be used;*
- b) the financial responsibility of the applicant, taking into account the applicant's past performance, is adequate for the quantity, concentration and types of waste that may be deposited and the manner of depositing waste;*
- c) the studies to be undertaken, works to be constructed, plans, including contingency plans, to be submitted, and monitoring programs to be undertaken; and*
- d) any future closing or abandonment of the appurtenant undertaking.*

(2) The monitoring programs referred to in paragraph (1)(c) may specify responsibilities of the applicant, the Nunavut Impact Review Board or Her Majesty in right of Canada.

(3) The Board shall, to the extent that it is authorized under this Act to do so, include in a licence the terms and conditions of any project certificate, referred to in section 12.5.12 or



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12.6.17 of the Agreement, that is issued in respect of the use of waters or deposit of waste or the appurtenant undertaking to which that use or deposit relates.

Section 71 *In fixing the conditions of a licence, the Board shall make all reasonable efforts to minimize*

- a) any adverse effects of the licensed use of waters or deposit of waste on aquatic ecosystems and on the persons who are entitled to be paid compensation under section 58 or 60;*
- b) any interference by any person referred to in section 62 with the existing use of waters by the Inuit, whether that use is or is not licensed; and*
- c) any loss or damage described in section 63.*

With all of the above in mind, the Applicant shall use its judgment to determine what information is relevant to the scope of the Application, taking into account the information and studies concerning the use of waters or the deposit of waste that are required for the Board to evaluate the qualitative and quantitative effects of the use or the deposit on waters, in accordance with **Section 48(2)** of the Act.



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2.0 Format of Supplemental Information to be Provided by the Applicant

Miramar Hope Bay Limited shall submit with the application a concise executive summary of the application and of any separate supporting document, report or study, in English, Inuktitut and Inuinnaqtun. A summary document should be presented which is to contain details of the information requested rather than general statements.

Individual plans such as: Spill Contingency; Water Management; Monitoring; QA/QC; Waste Management including Tailings Containment, Interim Waste Rock Storage, and Landfilling/Landfarming; Abandonment and Reclamation plan/cost estimate; Detailed engineering design plans and complementary qualified engineered drawings and reports; and Operational/Mine Management etc. shall be submitted. A separate document could provide details of supplemental information that fall outside of the above documents.

In complying with the NWB information guidelines, Miramar Hope Bay Limited, where practical, may combine components of the information requested above into more concise plans to provide clarity and eliminate duplication. If this practice is considered, then Miramar Hope Bay Limited shall clearly outline, through proper referencing and clear detailed statements, how the NWB shall consider the documents that have combined elements of information. Information management is the responsibility of MHBL. MHBL is to guide the NWB and regulatory bodies through its application in a fluid logical manner.

The NWB will not process an application that it deems to be incomplete and/or when supporting documents have not been submitted. The NWB will give the required hearing notice of no less than sixty-days after it deems the application to be complete. MHBL shall understand that the water licence application must be a stand-alone document.

3.0 Additional Documents to Assist the Applicant

For the development of supplemental information MHBL should be guided by, and is directed to, the following standards/guidelines/legislation that includes, but is not limited to:

- CCME – *Environmental Code of Practice for Above Ground and Underground Storage Tanks Systems containing Petroleum Product and Allied Petroleum Products (2003)*;
- CCME – *Canadian Environmental Quality Guidelines*



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- CCME – *Canadian-Wide Standards for Petroleum Hydrocarbons in Soil*
- DFO – *Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat;*
- DFO – *Freshwater Intake End-of-Pipe Fish Screen Guide;*
- DFO – *Guidelines for the Use of Explosives In or Near Canadian Fisheries Water;*
- DFO – *Policy on the Management of Fish Habitat and Habitat Conservation and Protection Guidelines;*
- DFO – *Policy for Management of Fish Habitat;*
- EC – *Guidelines for the Preparation of Hazardous Material Spill Contingency Plans;*
- EC – *MMER Environmental Effects Monitoring Program Protocol;*
- GN – *Contaminated Site Remediation;*
- GN – *Environmental Guideline for Contingency Planning and Spill Reporting in Nunavut;*
- GN – *General Management of Hazardous Waste in Nunavut;*
- GN – *Occupational Health & Safety Guidelines;*
- GN – *Spill Contingency Planning and Reporting Regulations;*
- GNWT/GN – *Spill Contingency Planning and Reporting Regulations;*
- GN – *Environmental Protection Act;*
- GNWT – *Ice Road Guidelines;*
- INAC – *A Policy Respecting the Prohibition of Bulk Water Removal from Major River Basins in Nunavut;*
- INAC – *Mine Site Reclamation Policy for Nunavut;*
- JC – *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*
- JC – *Territorial Lands Act;*
- JC – *Territorial Land Regulations;*
- JC – *Canadian Environmental Protection Act*
 - *Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on federal Lands or Aboriginal Lands Regulation*
 - *Sulphur in Diesel Regulation*
 - *Fuels Information Regulation No. 1*
 - *Sulphur in Gasoline Regulation*
 - *Benzene in Gasoline Regulation*
 - *Interprovincial Movement of Hazardous Waste Regulation*
 - *Federal Halocarbon Regulation*
 - *National Pollutant Release Inventory*
 - *Environmental Emergencies Regulation*
- JC – *Fisheries Act*



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- Metal Mining Effluent Regulations
- JC – Water Regulations (as attached to the Nunavut Waters and Nunavut Surface Right Tribunal Act) and other guidelines adopted by the NWB;
- NWTWB – *Guidelines for Abandonment and Restoration Planning for Mines in the NWT*;
- ASTM - Standards
- The Mining Association of Canada “A Guide to the Management of Tailings Facilities” (1998);
- CDA – Dam Safety Guidelines
- TC – *Transportation of Dangerous Goods Act/Regulations*;
- Workplace Hazardous Materials Information System (WHMIS);

Copies of all guidelines referenced in this document may be available on the NWB ftp site or with Justice Canada for federal legislation and policies. MHBL may have to contact the appropriate author of the above listed guidelines for a copy if needed.

MHBL is encouraged to consult with regulatory agencies on issues related with the above listed guidelines. When a guideline is used by MHBL the NWB requests the use of well-developed statements within the body of a reports text to clearly reference where a Guideline was used. When developing discussion and MHBL's case the licence application should point the Reader to the appropriate section of a regulatory guideline where additional information may be found.

4.0 Guidelines for the Provision of Supplemental Information

The NWB will not engage in an exhaustive process of conditionally approving technical reports through conditions set in a water licence. Thus it will be necessary to provide information related to design and management prior to water licence issuance. With this in mind MHBL is encouraged to develop design and water management beyond the conceptual and intermediate phases before the submittal of a water licence application.

Miramar Hope Bay Limited is to understand that each piece of design or management correspondence shall act as a discrete stand-alone document that effectively discusses the specifics of a particular design or management plan. Through the design of a full scale operational mine, it is intuitively understood that individual designs and management plans will interconnect with one another (i.e. Site water management is a function of the structures on site set to convey waters). Miramar Hope Bay Limited is to communicate the connectivity of discrete design and management plans through



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discussion in the discrete designs and management plans or through a separate document that details the macroscopic view of mine component interconnectivity.

The NWB encourages and expects Miramar Hope Bay Limited to adhere to best engineering practices and sound construction methods when designing and managing infrastructure related to the use of waters or the deposition of wastes. The NWB encourages the use of ASTM standards when defining and developing project specifics in technical documents. Generally the following information should be presented, though not limited to, when submitting application designs and plans:

- i Design requirements, design criteria, design parameters, design standards/analysis/method;
- ii Design assumptions and the limitations associated with such design assumptions;
- iii The inclusion of clear, definable engineering qualifiers with all design drawings and reports;
- iv Site specific data and analysis to support the design and management decisions made;
- v Materials that appropriately delineate the particulars of a design or plan;
- vi Construction methods and procedures in how infrastructure will be put in place on-site.
- vii Instrumentation and monitoring requirements of the proposed designs and plans;
- viii Details on how facilities, structures, and plans will be operated, maintained and implemented;
- ix Details on chemicals or other hazardous or potentially hazardous materials that will be used and will be in contact with or may impact water either directly or indirectly;
- x Mitigation measures that will be implemented when working in close proximity to water;
- xi Appropriate referencing of other documents and annexed materials.

Miramar Hope Bay Limited should also consider that the concept of *Adaptive Management* includes the need to describe the methods used in assessing the risks associated with uncertainty in design and management, and clearly outline the measures and quantifiable markers for when a final design decision will be made. Miramar Hope Bay Limited shall keep in mind that *Adaptive Management* is a flexible framework to implement final decisions through a mature intermediate design and not a “*revolving door*” design method that allows for multi-iterations to a preliminary design. A commitment to a final design needs to be made through the designs and plans submitted in the water licence application, or a clear defined criteria for which final design decisions will be made must be submitted when a final design can not be presented. Installing the strategy of *Adaptive Management* through the design and management of the Doris North Mine can positively refine mine operations through the dynamics of scientific modeling,



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experimentation and monitoring to improve processes and lessen environmental impact. The NWB will consider the key decision points MHL will use to define the *Adaptive Management* framework they plan to implement through mining operations.

The NWB expects that plans and designs shall be presented where the use of water or deposit of waste will take place. MHL shall also consider that information must be presented where there is a potential impact through the deposition of waste, and describe the measures the applicant proposes to take to avoid or mitigate **any** adverse impact of the use of waters or the deposit of waste¹; This may include, but not be limited to, the design and management of the following:

- i. earthwork infrastructure;
- ii. water intake facilities and how water will be withdrawn;
- iii. interim waste rock facilities;
- iv. tailings containment area;
- v. landfills;
- vi. landfarms;
- vii. fuel and chemical storage facilities;
- viii. explosives management areas and facilities;
- ix. construction materials (i.e. quarried rock);
- x. hazardous waste facilities;
- xi. site water management facilities;
- xii. wastewater treatment facilities;
- xiii. ore stockpiles and recovery reject materials;
- xiv. dewatering programs;
- xv. hydrostatic testing programs;
- xvi. road, airstrip and ice road construction;
- xvii. water use;
- xviii. macroscopic site water management;
- xix. spill contingency and emergency response;
- xx. interim and final abandonment and reclamation of the mine site;
- xxi. aquatic effects monitoring;
- xxii. general monitoring;
- xxiii. quality assurance and quality control;
- xxiv. geotechnical and structural monitoring;
- xxv. marine jetty design and management;
- xxvi. the collection of weather data for purposes of mine design.

¹ Section 48(3)(c)



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It is understood that the Doris North Project may not include all of the design, construction, monitoring, and management plans listed above and that other designs and management plans may be required to be submitted by MHL. The NWB is available to assist and provide additional guidance on each design and management plan through future interactions with MHL. MHL shall understand that there will be a requirement to provide appropriately qualified as-built construction drawings once structures have been constructed and are in operation.

The commitments made by MHL during the Nunavut Impact Review Board's (NIRB) process are to be clearly outlined through the application materials submitted. NIRB and other regulatory bodies will be consulted to ensure that all commitments have been appropriately addressed through the water licence application.

MHL is to submit a water application report that communicates structure design and management plans that use waters or may impact waters through the deposition of wastes. MHL is encouraged to develop design and management discussion through a clear methodical layout that is logical in nature. Additional information may be required from MHL following an initial assessment of the application by the NWB. The NWB will assist MHL in completing water licence application materials and recommends that MHL communicates with the NWB if uncertainty exists when preparing water licence application materials.

The NWB understands that MHL has communicated with and will provide each organization included on the NWB's distribution list with the application and determine the number of copies and the format (electronic and/or hard copies) each interested organization requires to complete their respective reviews.

PART B: GUIDELINES FOR THE PROVISION OF SPECIFIC INFORMATION

The NWB has prepared the attached Table of Contents (TOC) to guide the structure and format of the application. This TOC will act as a reference to where information, relevant to the water licence application, has been filed.

Section #	Section Description	Comments
	<u>APPLICATION DOCUMENT</u>	
	Executive Summary - English	
	Executive Summary - Inuktitut	
	Executive Summary - Inuinnaqtun	
1.0	Introduction	
1.1	Conformity Table	
1.2	Modifications to Site Layout	
2.0	Construction Phase	
2.0	Project Description	
2.1	Jetty	s. 41 NWNSRTA
2.2	Construction Rock Quarry Operations	
2.3	Underground Mine Development	
2.4	Waste Rock and Ore Management	
2.5	Tailings Management Facilities	
2.6	Plant Site Facilities	
2.7	Fuel Storage	
2.8	Explosives Storage Facilities	
2.9	Landfill and Land Farm	
2.10	Roads, Airstrip and Winter Roads	
3.0	Operations Phase	
3.1	Management Structure	
3.2	Underground Mine	
3.3	Mill (Ore Processing)	
3.4	Effluent Treatment	
3.5	Site Water Balance	NIRB Condition 14
4.0	Management and Mitigation Plans	
4.1	QA/QC	
4.2	Waste Rock and Ore Management	
4.3	Tailings Management	
4.4	Tail Lake Water Management Strategy	NIRB Condition 13
4.5	Water Balance and Site Water Management Plan	NIRB Condition 14
4.6	Hazardous Materials and Hazardous Waste Mgmt	
4.7	Emergency Response and Spill Contingency Plan	
4.8	Environment Management Plan	NIRB Condition 32
5.0	Water Withdrawal	
6.0	Residual Impacts	
6.1	Receiving Water Quality Estimates	
6.2	Proposed Discharge Limits	
7.0	Monitoring	
7.1	Climate	
7.2	Air Quality	

7.3	Noise	
7.4	Vegetation Metal Uptake	
7.5	Site Water Quality	
7.6	Tailings Geotechnical Monitoring	
7.7	Waste Rock Characterization	
7.8	Aquatic Effects	
7.9	Fish	
7.10	Wildlife	
8.0	Closure Phase	
8.0	Mine Closure and Reclamation	
8.1	Jetty	
8.2	Underground Mine	
8.3	Surface Facilities	
8.4	Tailings Management System	
8.5	Water Management	
8.6	Roads and Airstrip	
8.7	Post Closure Water Quality	
8.8	Post Closure Monitoring	
8.9	Reclamation Cost Estimates	
9.0	Land Leases	
9.1	Confirmation of Ownership	
9.2	Surface Leases	
10.0	Compensation	
10.1	Inuit Impact Benefit Agreement	
10.2	Fish Habitat No Net Loss Plan	
11.0	Project Costs	
11.1	Water Fees	
	Supporting Documents	
S1	Design of the Tailings Containment Area	
S2	Design of the Surface Infrastructure Components	
S3	Detailed Design Technical Specifications	
S4	Detailed Design Drawings	
S5	Hydrology and Meteorology Report	NIRB Condition 14
S6	Water Quality Model	NIRB Condition 13
S7	Geochemical Characterization of Quarry Materials	NIRB Condition 18
S8	Geochemical Characterization of Portal Development Rock	NIRB Condition 18
S9	Environmental Management System	NIRB Condition 32
S10	Environmental Protection Plan	NIRB Condition 32
	Emergency Response and Spill Contingency Plan	NIRB Condition 32
	Air Quality Management Plan	
	Noise Abatement Plan	NIRB Condition 29
	Hazardous Materials Management Plan	
	Ammonium Nitrate Management Plan	
	Landfill and Landfarm Management Plan	
	Mine Closure and Reclamation Plan	NIRB Condition 31 & 32

	Monitoring and Follow up Plan	NIRB Condition 32
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