Fisheries and Oceans Canada | Pêches et Océans Canada

Eastern Arctic Area
P.O. Box 358
Iqaluit, NU X0A 0H0

June 07, 2007

Your file Votre Référence
NWB 2AM-DOH

Our file Notre référence
NU-02-0117

Ms. Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board *Via electronic mail to:*
P.O. Box 119 licensing@nwb.nunavut.ca
Gjoa Haven, NU X0B 1J0

Dear Ms. Beaulieu:

Subject: DFO Intervention Comments to the Nunavut Water Board, Technical Meeting, Water Licence Application for the Doris North Project, Miramar Hope Bay Limited

Fisheries and Oceans Canada (DFO) would like to thank the Nunavut Water Board (NWB) for providing an opportunity to participate in the technical and pre-hearing meetings in support of a "Type A" Water Licence Application for the Doris North Project by Miramar Hope Bay Limited (MHBL).

MHBL proposes to construct and operate a new underground gold mine ("Doris North Project") in the West Kitikmeot Region of Nunavut. The project is located 685 km northeast of Yellowknife and approximately 125 km southwest of Cambridge Bay. The mine is on Inuit owned land, approximately 5 km south of the Arctic Ocean near Roberts Bay. The nearest communities are Umingmaktok, located approximately 75 km to the west, and Bathurst Inlet located 110 km to the southwest.

In preparation for the Public Hearings scheduled for August 13, 2007, Fisheries and Oceans Canada (DFO) offers the following technical comments with respect to the water licence application and the supporting documents as it relates to our mandate.

INTRODUCTION:

The Constitution Act (1982) provides the federal government with exclusive authority for sea coastal and inland fisheries within Canada's territorial boundaries. Fisheries and Oceans Canada exercises this authority under the *Fisheries Act*. Specifically, DFO is responsible for the management and protection of fish and marine mammals and their habitats. There are two fundamental provisions in the *Fisheries Act* that pertain to the conservation and protection of fish habitat. One is section 35 of the Act that prohibits the harmful alteration, disruption or destruction of fish habitat without an authorization from the Minister of Fisheries and Oceans or through a regulation under the *Fisheries Act*. The other is section 36 that prohibits the deposit of deleterious substance into fish bearing waters unless authorized by a regulation under the Act or by another law of Parliament.

Environment Canada, on behalf of the Minister of Fisheries and Oceans, administers section 36 of the *Fisheries Act*. DFO relies upon advice provided by Environment Canada regarding issues

pertaining to water quality. There are other sections of the *Fisheries Act* that pertain to the conservation and protection of fish and fish habitat and these include sections 20 (fishways), 30 (fish guards) and 32 (destruction of fish) among others.

DFO's Policy for the Management of Fish Habitat ("the Habitat Policy"), introduced in 1986, provides general guidance on the application of the habitat protection provisions of the *Fisheries Act* and applies to all projects that have the potential to harm fish habitat. The long-term objective of DFO is to achieve a net gain in the productive capacity of fish habitat for Canadian fisheries resources. A fundamental strategy for achieving this is to prevent the further loss of productive capacity of existing habitats. Productive capacity is defined in the Habitat Policy to mean the maximum natural capacity of habitats to produce healthy fish, safe for human consumption, or to support or produce aquatic organisms upon which fish depend. DFO will strive to achieve No Net Loss by avoiding impacts, by the application of mitigation and, failing that, to balance unavoidable habitat losses through habitat compensation on a project-by-project basis to maintain the productive capacity of habitats supporting fisheries resources. The Habitat Policy also places emphasis on integrated resource planning and review of project proposals on an ecosystem basis taking into account Fish Habitat Management plans and/or Fisheries Management Plans where they exist.

Under the Nunavut Land Claims Agreement, DFO participates in the regulatory review process led by the Nunavut Water Board (NWB). In this context, DFO has reviewed the Water Licence application and supporting documents as submitted by MHBL for impacts to fish and fish habitat. DFO respectfully submits the following comments as expert advice to the NWB to assist in their review of this project. The information requests and recommendations presented in this submission may be subject to change as new information is brought forward by MHBL during the technical review meeting and/or public hearing. Should new information be obtained, any changes in DFO's recommendations will be brought to the attention of NWB.

REGULATORY REVIEW AND TECHNICAL QUESTIONS/COMMENTS:

General Conditions - Water Quality:
Under agreement with DFO, Environment Canada (EC) administers section 36(3) of the *Fisheries Act* which prohibits the deposit of deleterious substances into fish frequented waters, unless authorized by regulation made under the *Fisheries Act*. While many aspects of water quality are administered by EC, DFO does maintain an interest in potential increases in suspended sediment due to the possibility for sediments to smother habitats once out of suspension.

It is DFO's understanding that all aggregate materials used for works or undertakings (including fish habitat compensation measures such as shoals and spurs) in or near water is clean competent rock, non-acid generating (NAG) and non-metal leaching (NML).

Resolution / Recommendations:
DFO recommends that EC's advice for the mitigation of impacts to water quality be adhered to as it relates to the Doris North Project.
Please confirm that all aggregate materials used for works or undertakings (including fish habitat compensation measures such as shoals and spurs) in or near water is clean competent rock that is non-acid generating and non-metal leaching.

General Conditions - Construction:
During the construction, operation, modification, maintenance and decommissioning of the various components of the Doris North Project infrastructure, several works will occur in or near water bodies and have the potential to harmfully impact fish and fish habitat. Activities associated with this project will involve the use of machinery in or near fish habitat, the withdrawal of water from lakes, and disturbing the bed and banks of water bodies with the potential to cause erosion and sedimentation. In most cases, there are common mitigation measures that can substantially reduce impacts to fish and fish habitat.

Resolution / Recommendations:
DFO recommends that all construction, operation, modification, decommissioning, abandonment and restoration plans for all infrastructure works or undertakings in or near water include best management practices for sediment and erosion control that will mitigate potential harmful impacts to fish and fish habitat.

Tail Lake - Construction of Tailings Dam and Dewatering of Outflow Stream:

The construction of the tailings impoundment dam and subsequent dewatering of the outflow channel of Tail Lake will result in the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. The HADD of fish habitat is prohibited under sub-section 35(1) of the *Fisheries Act* unless authorized by DFO under sub-section 35(2). Where the HADD is unavoidable Authorizations are not issued unless acceptable measures to compensate for the habitat losses are implemented by the proponent.

Resolution / Recommendations:
DFO acknowledges and appreciates the fact that MHBL has substantially completed a No-Net-Loss Plan for the mitigation and compensation of impacts to fish and fish habitat.

Tail Lake - Construction of Tailings Impoundment Area:
The use of fish bearing Tail Lake as a Tailings Impoundment Area (TIA) requires an amendment to the Metal Mining Effluent Regulations (MMER). These regulations were made under Sub-Section 36(5) of the *Fisheries Act* and provide conditions under which the deposit of deleterious substances into fish frequented waters will be allowed for metal mines. Under the MMER, if a proposed tailings impoundment area is fish frequented, then the water body in question must be added to Schedule II of the regulations prior to tailings deposition. This is a potentially lengthy process requiring an amendment to the regulation itself which must be approved by Governor-in-Council (GiC).

The regulatory amendments for MMER can only be initiated following the completion of the environmental assessment and once Fisheries and Oceans Canada has determined that impacts to fish habitat are acceptable and can be mitigated and/or compensated. Once these steps are completed, Environment Canada can develop the Regulatory Impact Assessment Statement (RIAS) at which time the amendment can be forwarded to GiC for consideration.

DFO forwarded a letter to Environment Canada on December 20, 2006 indicating that initiation of the *Fisheries Act* Metal Mining Effluent Regulation (MMER) amendment process may begin. With respect to the water licence application for MHBL, DFO defaults to EC's recommendations for the tailings impoundment area (TIA) in Tail Lake and other general water quality parameters as they relate to the Doris North Project.

Resolution / Recommendations:
DFO supports MHBL's continued progress towards meeting all of the obligations under the MMER as directed by Environment Canada, on behalf of DFO.

Doris Creek Bridge and Approaches:

Doris Creek is at least 7 m wide, under normal flow conditions, in the area where the TIA access road must cross. Since Doris Creek is a fish frequented water body, and is defined as navigable water; the crossing will be by means of a free span bridge. A pre-fabricated modular steel bridge will be assembled on two rock fill abutments. The roadway will be widened to 10 m on either side of the stream crossing and raised for a bridge approach angle slope of less than 5%.

Resolution / Recommendations:
DFO recommends that the bridge deck and road approaches be designed in a manner that does not allow stormwater or accidental spills to discharge directly into Doris Creek.

Float Plane and Boat Dock on Doris Lake:

The previous design of the float plane and boat dock was a rock-filled structure that was to be installed at the northwest end of Doris Lake. Construction of the structure would have required blasting to remove bedrock within Doris Lake.

The current design for the float plane and boat dock is a floating structure, located in a small bay of Doris Lake immediately southeast of the proposed mill. The dock portion will be a pre-fabricated modular unit, approximately 25 m long, and about 4 m wide, and will be held in place by six permanently installed bollards.

Resolution / Recommendations:
DFO requests that MHBL clarify the following:

- whether there is any longer a need for blasting associated with this new dock design?
- other than the approach ramp, are there any other shoreline works associated with the dock?
- what were the alternative methods that were considered for securing the dock?

DFO recommends that the dock be secured by tying back to shore (above the ordinary high water mark) and/or in a manner that complies with the DFO, *Nunavut Operational Statement for Moorings* which can be found at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/nu/index_e.htm. The DFO Operational Statement for Moorings only applies to those structures that are not permanently fixed to the bottom.
If the "permanent" bollards are the most appropriate method of securing the dock DFO recommends that these bollards be removed at or below the lake bed level during site decommissioning and restoration.

Water Intake Structure in Doris Lake:
The withdrawal of water from fish frequented waterbodies has the potential to entrain and impinge fish, result in the disruption or loss of fish habitat due to the construction of the water intake structure, and the potential to alter downstream water flows which could negatively impact fish habitat utilization.

The preliminary design included two project-specific water intake structures to be installed at the northwest end of Doris Lake for process water and potable water supply.

The water intakes were to be connected to a floating pump shack, which would have had no in-lake footprint. With mitigation (e.g., intake screening and sediment control during construction and removal), the construction, operation, and removal of the water intake structures were originally assessed as not adversely affecting fish habitat within Doris Lake.

The current design for the freshwater intake facilities includes a pump house located on the north shore of Doris Lake in close proximity to the float plane and boat dock. The pump intake will be a single 100 mm diameter HDPE pipe set on the bottom of the lake, with the intake approximately 25 m from shore. The pipe will be covered by clean rockfill to anchor it in place. The intake end of the pipe will be screened in accordance with the DFO "Freshwater End-of-Pipe Fish Screen Guidelines (DFO 1995). The intake end of the pipe will be out of the rockfill to prevent entrainment/impingement of fish eggs and fry if fish do use the rock substrate for spawning.

Because no detailed fisheries habitat information is available for the specific location of the proposed intake line in Doris Lake, prior to placement of the water intake line, MHBL has committed to the following:

- conducting a detailed habitat assessment of the fisheries habitat quality in the area to be disturbed by the intake line and rock cover,
- if high quality spawning or rearing habitat is identified, the location of the water intake will be adjusted to avoid disruption of the high quality habitat,
- installation of the water intake structure will be conducted in a manner to minimize the release of sediment to Doris Lake,
- the amount of in-water activity will be reduced to the minimum extent possible,
- silt curtains or other sediment control technology will be implemented as needed during the placement of the rockfill,
- total suspended solids (TSS) levels will be monitored during the construction of the water intake to ensure that the federal water quality guidelines for TSS are met (CCME 2006).

Resolution / Recommendations:
DFO recommends that information on fish habitat, and its use by fish, in the vicinity of the pipeline be provided to DFO for assessment along with proposed mitigation measures (including fish habitat compensation) that could offset any negative impacts.
DFO further recommends that the MHBL specify the type and size range of rock fill used to cover the water intake pipe.

General Conditions No-Net-Loss (NNLP) Plan for Fish Habitat

As a result of advancing the detail design and proceeding to regulatory reviews several changes have been made to in-water infrastructure and proposed fish habitat compensation measures in the NNLP.

Resolution / Recommendations:
DFO recommends that the Net Loss Summary (Table 18) be updated to reflect changes in components of in-water infrastructure and fish habitat compensation measures.
DFO recommends that the monitoring plan for in-water works, including compensation measures, be updated and appended to the NNLP.

Specific Conditions No-Net-Loss Plan for Fish Habitat

Creation of Rearing Habitat in Doris Lake:

To provide additional rearing habitat for lake trout and other species in Doris Lake, shallow reefs, created using riprap rockfill, will be constructed at six locations in Doris Lake. Placement of large substrate would create a shallow (<0.25 m deep) area with
interstices that will provide rearing and nursery habitat (e.g., cover for feeding and hiding), thereby reducing predation on the juveniles by adult lake trout or other predators.
The rock substrate will be colonized by periphyton and invertebrates, thereby providing
additional food source for rearing fish (i.e., in comparison to the bedrock or silt substrates). This in turn should result in increased survival of the juvenile fish, and increase the benthic productivity in the enhanced areas. Appropriate design drawings for the proposed rearing habitat areas in Doris Lake are provided.

Resolution / Recommendations:

DFO is substantially satisfied with the creation of fish rearing habitat in Doris Lake as proposed by MHBL.

Roberts Lake Outflow Fish Passage:

Currently, the boulder section of Roberts Lake outflow presents a migration hindrance or blockage in low to moderate flow years, resulting in the delay or loss of migrating Arctic char and lake trout during the periods of low flow. Field studies have shown that during these low flow periods, large numbers of adult fish returning to Roberts Lake become stranded in the boulder reach and perish. The loss of these fish returning to overwinter and/or spawn in the Roberts Lake system represents a loss of biomass and loss of productive capacity to this system.

The proposed habitat compensation includes the modification of Roberts Lake outflow to facilitate adult fish passage for most low and moderate flow conditions, without affecting the hydraulic control at the outlet of Roberts Lake. The design of the works includes the strategic removal of boulders to create a low flow passage channel through the area where stranding generally occurs.

Resolution / Recommendations:

DFO recommends that MHBL provide details on the “methods of construction” for selective boulder removal including any need for equipment access and whether blasting will be required to remove larger boulders.
DFO further recommends that the boulders removed from this reach of the channel be more widely distributed in the channel upstream and/or downstream to provide current breaks and cover for fish and aquatic invertebrates. The removed boulders should not be used to line the banks of the channel (for further clarification please discuss with DFO).

Stream Habitat Enhancement in Tributary E09 of Roberts Lake:

The NNLP included provisions for additional stream rearing habitat in a tributary to Roberts Lake. In the Revision 5 of the NNLP it was proposed that a rock ledge along a lip of a pool be removed to provide access by juvenile Arctic char to a second pool, thereby increasing rearing habitat. However, during a detailed survey in 2006, it was determined that the low streamflow in most years would make the proposed enhancement unfeasible. As a consequence, an alternative enhancement opportunity, similar to that proposed in previous versions of the NNLP, has been developed. This involves the construction of two additional pools in stream E09 at the south end

of Roberts Lake. The objective of the creation of additional small pool habitat in the stream is to increase the summer rearing habitat for Arctic char. In previous field studies in Roberts Lake, Arctic char juveniles were observed to use these small pools within the tributaries for rearing, and likely as a mechanism to avoid predation by larger lake trout and Arctic char in the main body of Roberts Lake. By increasing the amount of rearing habitat (i.e., small pools in the narrow tributary stream), it is expected that there will be a small increase in the juvenile Arctic char survival and growth in this tributary.

While DFO supports this approach in principle, only conceptual and generic design drawings are provided for the proposed compensation works in Stream E09. Exact locations are not indicated and no information is provided on existing habitat conditions in stream E09.

Note: Stream E09 channel bankfull width appears to range from approximately 0.5m to 2.0m.

Resolution / Recommendations:
DFO recommends that MHBL identify the specific reach that is to be enhanced in stream E09 and provide a detailed description of existing fish habitat conditions.
DFO further recommends that a fluvial geomorphological assessment (or equivalent) be completed to determine the appropriate natural channel cross section, longitudinal section, plan form configuration and substrate type.
DFO also recommends that site specific design drawing(s) be prepared, including details on site access and methods of construction.

Jetty Construction in Roberts Bay:

DFO acknowledges that works or activities in Roberts Bay (marine environment) may not fall within the NWB's mandate. They are included here for sake of completeness, as matters that fall within DFO's mandate, and for the benefit of the proponent in the expeditious review of the project.

Fish habitat compensation for the loss of habitat associated with the jetty out-of-water footprint included the addition of eight rock spurs off of the jetty, and six rock spurs located along the shoreline of Roberts Bay, to provide a total of 1200 m^2 of riprap as rearing and foraging habitat for fish. The interstices between the riprap sized rocks is intended to provide increased cover for juvenile fish (in comparison to the existing predominantly sand and silt substrate), and will provide substrate for colonization by marine benthic fauna, which will provide forage for juvenile fish.

Resolution / Recommendations:
DFO recommends that MHBL conduct a coastal engineering assessment to determine the appropriate rock size for the habitat compensation spurs to ensure that they function as intended over time.
DFO recommends that the geogrid used under the jetty need **not** extend beyond the proposed 5m perimeter of the jetty footprint. That is to say that the geogrid is not required under those portions of the jetty spurs that extend beyond the 5m perimeter of the jetty footprint. Furthermore DFO recommends that geogrid **not** be used under the 6 shorefast spurs in Roberts Bay. (Note: this recommendation is conditional on concurrence with MHBL engineers)
Please note that a jetty construction timing restriction of July 15 to August 30 has been previously discussed, and agreed to, with MHBL. Therefore, DFO recommends that all in-water works and undertakings in Roberts Bay be completed outside of this construction timing restriction window.

SUMMARY:

In summary, DFO appreciates the on-going efforts of MHBL and supports their approach, in principle, to mitigate and compensate impacts to fish and fish habitat associated with the Doris North Project. Appropriate consideration and resolution of the above recommendations will help to ensure the guiding principle of no net loss of fish habitat productivity is achieved. DFO looks forward to participating in the Nunavut Water Board public hearing for MHBL's water licence application for the Doris North Project. Should you have any questions, please contact Amy Liu directly by telephone at (867) 979-8007 or by fax at (867) 979-8039.

Yours sincerely,

Original signed by:

Paul J. Savoie
Senior Habitat Management Biologist
Fisheries and Oceans Canada – Eastern Arctic Area