



Fisheries and Oceans
Canada

Pêches et Océans
Canada

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

Secteur de l'Arctique de l'est
Boîte postale 358
Iqaluit, NU X0A 0H0

Votre référence

June 28, 2010

Our file *Notre référence*
02-HCAA-CA7-00117

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

Via Email:
licensing@nunavutwaterboard.org

Dear Mrs. Beaulieu:

Subject: 100528 2BE-HOP0712 Amendment 3 - Hope Bay Project - Hope Bay Mining Ltd. – Type “B”

Fisheries and Oceans Canada (DFO) received a Type “B” Amendment Application for the Hope Bay Project from the Nunavut Water Board (NWB) on May 28, 2010. The NWB invited all interested parties to provide comments on the amendment application.

DFO Referral No.: **02-HCAA-CA7-00117**
Title: **DORIS NORTH (FORMERLY DORIS HINGE GOLD)
PROJECT - HOPE BAY JOINT VENTURE**

Our review consisted of:

- Letter to Chris Hanks from the NWB, Subject: Hope Bay Mining – Hope Bay Project – Amendment 3 – Type “B”, dated May 28, 2010.
- Cover letter and Water License Application Amendment 3, signed by Chris Hanks, dated April 16, 2010.
- Executive Summary, Application for Amendment No.3 of Water License No. 2BE-HOP0712, received by NWB on April 23, 2010.
- Fresh Water Waterbody Selection for the Regional Drilling covered by 2BE-HOP0712, received by the NWB on April 23, 2010.
- Map titled “Hope Bay Exploration Drilling Water Sources, dated June 2007.
- Memorandum to Chris Hanks from RESCAN, Subject: Potential effects on fish and fish habitat of water level drawdown in lakes of the Hope Bay Project area as a result of drilling activities, dated April 15, 2009.

*Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

We understand that Hope Bay Mining Limited (HBML) purposes to:

- Withdraw drill water only from water bodies possessing a surface area greater than or equal to 15,000 m²
- Volume of water for drilling purposes shall not exceed 80 cubic meters per day
- A maximum lake water level drawn down amount of 2 cm

DFO would like to provide the following comments:

- DFO has no objects to deleting the reference to the June 2007 drawing in the 2BE-HOP0712 water licence.
- Where possible, DFO recommends withdrawing water from non-fish bearing water bodies and supports the use of larger water bodies as sources of water withdrawal.
- DFO acknowledges that HBML is using the DFO – Mineral Exploration Operational Statement (OS) and that condition 11.2 states the following: *"Ensure water withdrawal volumes do not impact fish or fish habitat. Withdrawals from fish-bearing waters should not result in any noticeable change in water level or downstream flows, particularly during sensitive life stages (e.g., by dewatering spawning or egg incubation areas)."* It is our opinion that if HBML is using the OS condition 3 of the current NWB water licence does not need to be changed.
- DFO Nunavut now has a winter water withdrawal protocol titled "DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut". If HBML is planning to withdraw water under ice-covered conditions, we recommend they follow the attached protocol.

I trust the information provided will be of assistance in the Nunavut Water Board's review of the Type "B" amendment application for HBML. If you have any questions please contact Gary Cooper at 905-639-4396, by fax at 905-639-3549, or by email at gary.cooper@dfo-mpo.gc.ca.

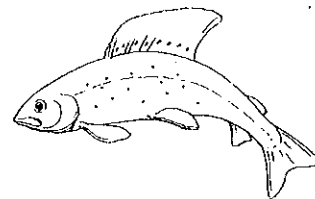
Yours sincerely,



Gary Cooper
Habitat Management Biologist
Fisheries and Oceans Canada – Eastern Arctic Area

Copy: Eric Kan – Fisheries and Oceans Canada
Francios Landry - Rescan

Attachment



DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut

Rationale

In the Northwest Territories and Nunavut, winter activities such as access road construction, exploratory drilling and camp operations often require large amounts of water. Excessive amounts of water withdrawn from ice-covered waterbodies can impact fish through oxygen depletion, loss of over-wintering habitat and/or reductions in littoral habitat. The potential for such negative impacts to over-wintering fish and fish habitat has made winter water withdrawal a critical issue for Fisheries and Oceans Canada (DFO) in the Northwest Territories and Nunavut. To mitigate impacts to fish from water withdrawal from ice-covered waterbodies, and to provide standardized guidance to water users, including volume limits for certain water source types, DFO has developed this protocol in conjunction with industry and other regulators.

For the purposes of this protocol, a **waterbody** is defined as any water-filled basin that is potential fish habitat. A waterbody is defined by the ordinary high water mark of the basin, and excludes connecting watercourses.

This protocol will **not** apply to the following:

- Any waterbody that is exempted by DFO (e.g. Great Bear Lake, Great Slave Lake, Gordon Lake, and others as and when determined by DFO), and;
- Any waterbody from which less than 100m³ is to be withdrawn over the course of one ice-covered period.

In order to establish a winter water withdrawal limit for a given waterbody, the following criteria must be adhered to:

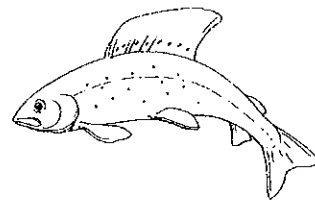
1. In one ice-covered season, total water withdrawal from a single waterbody is not to exceed 10% of the available water volume calculated using the appropriate maximum expected ice thickness provided in Table 1.
2. In cases where there are multiple users withdrawing water from a single waterbody, the total combined withdrawal volume is not to exceed 10% of the available water volume calculated using the appropriate maximum expected ice thickness provided in Table 1. Therefore, consistent and coordinated water source identification is essential.
3. Only waterbodies with maximum depths that are ≥ 1.5 m than their corresponding maximum expected ice thickness should be considered for water withdrawal (Table 1). Waterbodies with less than 1.5m of free water beneath the maximum ice are considered to be particularly vulnerable to the effects of water withdrawal.
4. Any waterbody with a maximum expected ice thickness that is greater than, or equal to, its maximum depth (as determined from a bathymetric survey) is exempt from the 10% maximum withdrawal limit (Table 1).

To further mitigate the impacts of water withdrawal, water is to be removed from deep areas of waterbodies (>2 m below the ice surface) wherever feasible, to avoid the removal of oxygenated surface waters that are critical to over-wintering fish. The littoral zone should be avoided as a water withdrawal location. Water intakes should also be properly screened with fine mesh of 2.54 mm (1/10") and have moderate intake velocities to prevent the entrainment of fish. Please refer to the *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO, 1995) which is available upon request, or at the following internet address: www.dfo-mpo.gc.ca/Library/223669.pdf.

In order to determine the maximum water withdrawal volume from an ice-covered waterbody, and thereby conform to this protocol, the following information must be provided to DFO for review and concurrence prior to program commencement.

Water Source Identification

1. Proposed water sources, access routes, and crossing locations clearly identified on a map, with geographical coordinates (latitude/longitude and/or UTM) included.
2. Any watercourse connectivity (permanently flowing and/or seasonal) between the proposed water source and any other waterbody or watercourse.



DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut

3. Aerial photos or satellite imagery of the water sources.
4. Estimated total water withdrawal requirement for work or activity and estimated total water withdrawal per water source (in m³).

Bathymetric Survey Results

1. For all waterbodies: One longitudinal transect, connecting the two farthest shorelines, is to be conducted regardless of waterbody size. Note: a longitudinal transect may be straight or curved in order to accommodate the shape of a lake (see Figure 1).
2. For waterbodies equal to or less than 1 km in length: a minimum of one longitudinal transect and two perpendicular transects are to be conducted. Perpendicular transects should be evenly spaced on the longest longitudinal transect, dividing the lake into thirds (Figure 1).
3. For lakes greater than 1 km in length: a minimum of one longitudinal transect is to be conducted. Perpendicular transects (minimum of 2) should be evenly spaced on the longest longitudinal transect at maximum intervals of 500 m.
4. Additional transects should be run as required to include irregularities in waterbody shape such as fingers or bays (Figure 1).
5. All longitudinal and perpendicular transects are to be conducted using an accurate, continuous depth sounding methodology, such as open water echo sounding or ground penetrating radar (GPR), that provides a continuous depth recording from one shore to the farthest opposing shore (Figure 1). Any alternative technology should be reviewed by DFO prior to implementing for bathymetric surveys.

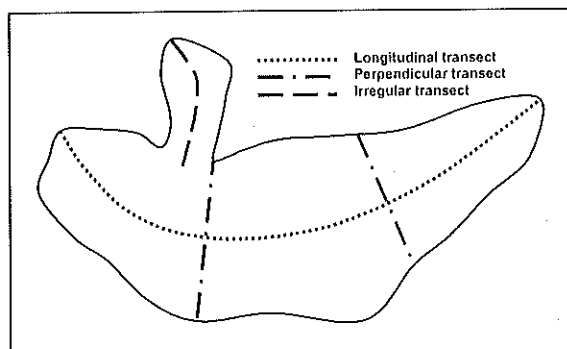
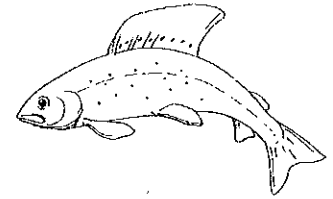


Figure 1. Minimum transect layout for a lake that is less than 1 km in length, with an irregularity.

Volume Calculations

1. Document the methods used to calculate surface area. If aerial photos or satellite imagery were used, provide the date (day/month/year) taken, as surface area may change depending on the time of year. If maps were used, provide the year that they were surveyed.
2. Detail the methods used to determine the total volume of free water, incorporating the relevant bathymetric information.
3. Calculate the available water volume under the ice using the appropriate maximum expected ice thickness, i.e. $Total\ Volume_{lake} - Ice\ Volume_{max\ thickness} = Available\ Water\ Volume$ (see Table 1 for maximum ice thickness).
4. For programs where ice-chipping is used, the total ice volume to be removed from the waterbody should be converted to total liquid volume and incorporated into the estimate of total water withdrawal requirement per water source.



DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut

Table 1. Maximum expected ice thickness, and corresponding water depth requirements, for different regions in the Northwest Territories.

Area	Maximum Expected Ice Thickness (m)	Minimum Waterbody depth Required for 10% Water Withdrawal (m)
Above the Tree Line	2.0	≥3.5
Below the Tree Line - North of Fort Simpson	1.5	≥3.0
Deh Cho -South of Fort Simpson	1.0	≥2.5

A brief project summary report documenting and confirming total water volume used per water source and corresponding dates should be submitted to DFO within 60 days of project completion. Information should be provided in the following format (this information would also be useful as part of the project description):

Lake ID	number and/or name
Coordinates	latitude and longitude and/or UTM coordinates
Surface area	in ha
Total Lake Volume	in m ³
Under Ice Volume	in m ³ (based on max ice thickness for region)
Max expected ice thickness value used	in m
Calculated 10% Withdrawal volume	in m ³
Total required water volume extracted	in m ³
Aerial photographs of waterbody	PDF format
Bathymetric Map(s) of waterbody	PDF format

Any requests deviating from the above must be submitted to DFO and will be addressed on a site-specific basis.

Beaver and Muskrat

Many species of animals are highly sensitive to water fluctuations. In areas where beaver and muskrat may occur, the appropriate agencies or organizations should be consulted to determine if harmful effects will result from your activities, and whether these effects can be successfully mitigated through modifications to your plans including best management practices.

Please note that adherence to this protocol does not release the proponent of the responsibility for obtaining any permits, licenses or authorizations that may be required.

For more information contact DFO at (867) 669-4915.