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Canada

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Your file *Votre référence*

Our file *Notre référence*  
YK05100

May 29, 2009

Julie Ward, Project Manager  
Indian & Northern Affairs  
Contaminants and Remediation Directorate  
4920 - 52nd St, Precambrian Bldg  
Yellowknife, NT X1A 3T1

**By Email**

Dear Julie:

**Re: Tundra Mine Phase II Remedial Action Plan – Water Treatment and Discharge Scenario**

In a meeting with you on May 15, 2009, Fisheries and Oceans Canada (DFO) was made aware of a potential change to the proposed discharge scenario for the tailings water treatment at Tundra Mine as part of the Phase II Remedial Action Plan (RAP). It was communicated that the preferred approach would be to commence treatment and discharge of the mine water prior to July 15<sup>th</sup> to reduce the number of seasons required for the water treatment process.

Over the past year, in meetings, correspondence as well as in the Phase II RAP submitted to the Mackenzie Valley Land and Water Board (MVLWB) in November 2008, INAC outlined that the preferred option for managing the 1.2 million cubic meters of tailings water at the Tundra Mine site was treatment over 2-3 seasons with discharge commencing after July 15<sup>th</sup> each season to avoid sensitive fisheries timing windows in the spring.

It is our understanding that upon further review of the proposed discharge option, INAC has evaluated the costs of running the water treatment facility for three seasons. If treatment and discharge can begin sooner (early June), INAC would gain an extra 1.5 months per open water season and only require water treatment over two summer seasons versus three. This could save the Government of Canada approximately \$3-4 million.

The July 15<sup>th</sup> discharge date was based on specialist advice provided by DFO to both INAC and the MVLWB recommending that the DFO Operational Statement on Northwest Territories In-Water Construction Timing Windows for the Protection of Fish and Fish Habitat be followed. These restricted activity periods are determined on a case by case basis according to the species of fish in the water body, their spawning time and where the water body is located.

As you know, aquatic studies on the small water bodies downstream of the Tundra Mine tailings containment area (TCA) have shown that Arctic grayling (*Thymallus arcticus*) use the system of lakes and streams from Whale Tail to Powder Mag Lake. Lake whitefish, lake trout, burbot and northern pike also use Sandy lake as habitat. In particular, recent Arctic grayling spawning habitat

enhancement work has occurred in the small stream at the outlet of Sandy Lake (Stream B). Baseline studies undertaken in the area in 2003 showed that the small stream at the inlet of Sandy Lake (Stream C) also contains Arctic grayling spawning habitat and juvenile grayling were observed and captured there.

Arctic grayling migrate from lakes into the small streams to spawn in the early spring. Eggs incubate in the substrate for approximately 1-2 weeks and, after emergence, the young-of-year (YOY) larval and juvenile fish remain in the stream rearing and feeding for an additional 2-3 weeks prior to migrating out into the lakes. The additional discharge of treated mine water during this period has the potential to change the water depths, velocities, temperature, food availability and total suspended solids (TSS). Changes in these parameters can disrupt adult spawning activity, egg development, YOY rearing and feeding activity and could potentially physically alter the spawning habitat in these streams.

DFO prefers that the sensitive fisheries "timing windows" included in our Operational Policy Statements be followed to avoid impacts to fish and fish habitat, but when these measures cannot be met by a proponent, DFO must undertake a more site specific review of the activity and predicted impacts.

Upon further review of the information on the downstream fish habitat and potential impacts from early discharge, DFO has determined that the proposed early discharge of treated mine water over two open water seasons will not require Authorization under subsection 35(2) of the *Fisheries Act*. However, the proposed activity does have the potential to result in the harmful alteration, disruption or destruction of fish habitat if appropriate mitigation is not applied. Given the existing risks associated with the water levels in the TCA at the Tundra Mine site and the additional cost to the government to operate the treatment facility for an extra season, DFO has determined that the potential short-term impacts to the downstream fish habitat from early discharge are acceptable in order to minimize the overall environmental risk and impact at the site by completing the water treatment in two seasons.

However, in order to further understand and manage the potential risks to fish and fish habitat associated with the proposed early discharge, DFO recommends the following:

- The water treatment discharge scenarios that have undergone ecological risk assessment be revisited and, if required, additional assessment of the ecological risks to the aquatic environment associated with early discharge over two seasons be evaluated in order to better understand and communicate the potential risks.
- The information and results from the physical assessment of the small connecting water bodies downstream of the TCA be used to evaluate the potential for erosion and sediment transport through the connecting streams (including the known spawning habitats) due to the elevated flow levels associated with the early discharge.
- The development of operational procedures which will ensure that erosion to all downstream water bodies is minimized during discharge. A monitoring program should be developed which ensures regular monitoring for increased erosion and channel modification in downstream waterways. If monitoring identifies any problems, discharge of water

should stop and any contingency and/or appropriate erosion and sediment control measures implemented immediately.

- The development and implementation of a plan to monitor spawning activity in the known spawning habitats during the early discharge period to verify whether the discharge is impacting Arctic grayling spawning activity downstream.
- The development and implementation of a plan which monitors arsenic concentrations in sediments of both lake and stream habitats to ensure it does not pose a long term risk to fish and fish habitat.

DFO will continue to work with INAC to develop monitoring and mitigation measures that can be implemented to verify and manage the potential impacts to fish and fish habitat associated with early discharge. Please note that this letter does not constitute authorization of these undertakings pursuant to the *Fisheries Act*. It is the proponent's responsibility to obtain any approvals that may be required under any other legislation.

DFO appreciates the opportunity to provide comments on this material. Please contact me at (867) 669-4944 if you have any questions or wish to discuss any of the foregoing in more detail.

Sincerely,



Morag McPherson  
Habitat Biologist  
Fish Habitat Management  
Department of Fisheries and Oceans - Western Arctic Area

cc: M. Lange, DFO  
G. Fillatre, DFO  
A. Sparks, EC