



Water Resources
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
3AM-GRA1015

December 18, 2013

Our file - Notre référence
CIDM# 757659

Phyllis Beaulieu
Manager, Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0A 1J0

Re: #3AM-GRA1015 – Rankin Inlet Seasonal Replenishment of Nipissar Lake – Government of Nunavut, Department of Community and Government Services (GN-CGS) – Kivalliq Region – Amendment Application

Dear Phyllis Beaulieu:

Please be advised that Aboriginal Affairs and Northern Development Canada ("AANDC") have completed a technical review of the water license amendment application 3AM-GRA1015 submitted by Stantec Architecture Ltd. on behalf of Government of Nunavut's Department of Community and Government Services. The Nunavut Water Board ("NWB") circulated the amendment application for technical review on November 19, 2013. All documents related to the request posted on the NWB ftp site under 3AM-GRA1015 were included in my review (see attached Technical Review Memo).

Should you have any questions or comments, please do not hesitate to contact me at (867) 975-4282 or by e-mail at ian.parsons@aandc-aadnc.gc.ca

Regards,

Sent via Email

Ian Parsons
Regional Coordinator

Cc. Murray Ball, Manager of Water Resources, AANDC
Erik Allain, Manager of Field Operations, AANDC
Karen Costello, Director of Resource Management, AANDC

Canada



Technical Review Memorandum

To: Phyllis Beaulieu – Manager of Licensing, Nunavut Water Board

From: Ian Parsons – Regional Coordinator, AANDC

Existing Licence: 3AM-GRA1015

Re: #3AM-GRA1015 – Rankin Inlet Seasonal Replenishment of Nipissar Lake – Government of Nunavut, Department of Community and Government Services – Kivalliq Region – Amendment Application

1. Project Description

The Government of Nunavut's Department of Community and Government Services ("GN-CGS") – has proposed to pump water from Char River to replenish Nipissar Lake (the community's primary water source). Currently water is being withdrawn from Nipissar Lake and the annual withdrawal is beginning to exceed the lake's natural replenishment/recharge rate. The proposed project would allow for seasonal replenishment of Nipissar Lake with water to be withdrawn from Char River, during the summer, which exits Lower Landing Lake.

A proposed overland pipeline would transport water from Char River and discharge it at the closest end of Nipissar Lake, the water would be discharged onto a concrete pad armored with rip rap to prevent soil erosion from the flowing water. Given that the river drains into Hudson Bay, the Proponent claims there will be no negative impacts to Lower Landing Lake, Char River or other waterbodies within the watershed.

A trailer mounted diesel powered pump would be utilized to pump the water from Lower Landing Lake (i.e., Char River) to Nipissar Lake. The pump rate would depend on water consumption (i.e., demand). Using *Manning's Formula for Uniform Flow*, the theoretical velocity and flow rate for Char River was determined to be 1,440m³/hr. Maximum pumping withdrawal from Char River is proposed to be 700USGPM or 159m³/hr – roughly 10% of the flow rate.

Studies conducted in 1995 and replicated in 2009 determined that the volume of Nipissar Lake had decreased by 660,520m³ - roughly 44,000m³/year. The studies examined climate variables such as precipitation and evapo-transpiration and concluded that climate was not a factor in the decreased volume. The Municipality of Rankin Inlet is using more water than is being naturally replenished.

Design calculations presented by FSC Architects & Engineers on behalf of the GN-CGS suggest that water withdrawals required to replenish Nipissar Lake will increase consistently with projected population growth over the next 20 years.



2. Results of Review

As most of Aboriginal Affairs and Northern Development Canada's ("AANDC") original information requests (IR's), contained in a letter dated September 20, 2013, have not been fully addressed our technical review and subsequent comments will contain and be largely centered on the original IR's.

- AANDC recommends that prior to issuing any water licence, all other applicable regulatory authorizations should be issued (i.e., land use permit, Nunavut Planning Commission conformity decision, Nunavut Impact Review Board screening decision, Department of Fisheries and Oceans authorizations, etc.).

The Proponent indicates in a letter dated November 6, 2012, that minimal information has been developed evaluating the impacts of water withdrawal on Lower Landing Lake and its downstream environment. In order to properly address concerns held by the Nunavut Water Board ("NWB") and other parties, the Proponent had requested more specific information and clarification of their scope. Listed below are four specific concerns that AANDC has regarding potential impacts on water withdrawal from Char River.

- i) AANDC recommends describing natural fluctuations, variability and sources of variability in flow rates in Char River, including seasonal fluctuations. Theoretical velocity and flow rates had previously been determined based on *Manning's Formula for Uniform Flow*. However, based on local observations of flow, we are concerned that actual flow variability may create times when flow does not meet predicted theoretical uniform discharges, and that further information on actual flows may be warranted before committing to this source. AANDC recommends that a water balance/flow study of Char River be conducted to provide confidence that the source will be viable when taking environmental flows into account.
- ii) AANDC's letter dated September 20, 2013 asked that the Proponent describe existing and/or proposed protected areas, special management areas and conservation areas within the watershed or downstream environment. The Proponent responded by stating that they were unaware of any such existing areas. AANDC, at this time would like to advise the Proponent that there is a fish habitat compensation project that is on-going directly downstream of the proposed water withdrawal area. AANDC recommends that the proponent consult with Department of Fisheries and Oceans regarding



potential impacts on fish habitat in the compensation area and the downstream watershed.

- iii) AANDC recommends that the Proponent provide additional information on water chemistry within Lower Landing Lake and Char River and whether or not it is substantially different from Nipissar Lake, outlining any potential impacts water transfers will have on water quality of the source and discharge waterbodies.
 - iv) AANDC recommends that the Proponent include or undertake an assessment of alternative waterbodies in the event that the location and /or waterbody is inadequate for replenishment of Nipissar Lake and include rationale for choosing Lower Landing Lake.
- AANDC recommends that the Proponent submit a stand alone spill contingency plan with respect to the pumping station and generators.

AANDC at this time would like to note that we have received concerns from community members of Rankin Inlet about the quality of their drinking water. AANDC believes that it may be in the best interest of the Hamlet to have an In-Person Public Hearing. AANDC, however, acknowledges that the NWB has the final authority on type of hearing and we will participate in whatever type of hearing the NWB decides.