



Your file - Votre référence
3BM-IGL15203

June 26, 2015

Our file - Notre référence
IQALUIT-#923849

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
GJOA HAVEN, NU X0E 1J0

**Re: Aboriginal Affairs and Northern Development Canada Review of the Hamlet of Igloolik's
Application to Amend their Type B Municipal Water Licence, No. 3BM-IGL1520**

Dear Ms. Beaulieu:

Thank you for your email of May 26, 2015, concerning the above mentioned application. A memorandum is provided for the Board's consideration. Comments and recommendations have been provided pursuant to Aboriginal Affairs and Northern Development Canada's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

Please do not hesitate to contact me by telephone at 867-975-4555 or email at David.Abernethy@aandc-aadnc.gc.ca for further information.

Sincerely,

David Abernethy
Regional Coordinator
Water Resources Division
Resource Management Directorate
Aboriginal Affairs and Northern Development Canada
IQALUIT, NU X0A 0H0

Encl.

c.c.: Andrew Keim, A/Manager, Water Resources Division, AANDC Nunavut
Erik Allain, Manager, Field Operations Division, AANDC Nunavut

Memorandum

To: Phyllis Beaulieu, Nunavut Water Board

From: David Abernethy, Aboriginal Affairs and Northern Development Canada

CC: Andrew Keim (AANDC) and Erik Allain (AANDC)

Date: June 26, 2015

Re: Application to Amend Water Licence No. 3BM-IGL1520

Applicant: Hamlet of Igloolik

Project: Construction of New Sewage Lagoon and Rehabilitation of Existing Sewage Lagoons

Region: Kitikmeot

Comments:

Background

On May 26, 2015, the Nunavut Water Board (NWB) provided notification of the Hamlet of Igloolik's (the "Hamlet") application to amend their type B water licence, No. 3BM-IGL1520, to allow for the construction of a new sewage lagoon and rehabilitation of existing sewage lagoons. The Hamlet's existing sewage treatment system (four independent lagoons) cannot accommodate the Hamlet's current storage requirements (current capacity is 42,000 m³, requires 75,000 m³ at the present time) and is not structurally sound (inadequate and failing berms).

The Hamlet intends to build a new sewage lagoon to the west of the existing lagoons. The existing lagoons will be rehabilitated and changed into two large cells. The three lagoons (new and rehabilitated) will be fully lined (impervious) and have adequately sized berms to retain sewage effluent and support vehicle access for maintenance. The new total storage capacity will be 124,220 m³, of this amount, 57,000 m³ will be stored in the new lagoon cell and 67,220 m³ in the rehabilitated lagoons. It was calculated that 124,220 m³ of storage capacity would be required to support the Hamlet's population growth until the year 2036 (20 year life) taking into consideration the effects of precipitation and evaporation.

The new sewage lagoon will be constructed before the existing sewage lagoons are rehabilitated. It will be used to store and treat sewage while the existing lagoons are rehabilitated.

The sewage treatment system will be decanted annually over a period of 30 days in late summer to a downstream wetland (vegetated filter strip) for further polishing before entering the marine environment (Turton Bay, Foxe Basin). The wetland will have an area of 42.8 hectares (addition of 13.9 hectares to the

existing 28.9 hectares). The distance from the lagoons to the ocean is 450 metres.

The effluent discharge criteria included in Part D, Item 3 of the licence will continue to apply to thesewage disposal facility's final control point (Monitoring Program Station No. IGL-4) and final effluent discharge point prior to entering Foxe Basin (MPS No. IGL-5). The criteria are as follows:

Parameter	Maximum Concentration of Any Grab Sample
BOD ₅	100 mg/L
Total Suspended Solids	120 mg/L
Fecal Coliforms	1 x 10 ⁶ CFU/100 ml)
Oil and Grease	No visible sheen
pH	Between 6 and 9

Interested parties were asked to review this application and provide comments by June 26, 2015.

Results of review

On behalf of Aboriginal Affairs and Northern Development Canada (AANDC), the following comments and recommendations are provided:

1. Sludge management

Source: Exp Services Inc 2014. *Design Brief, Optimization of the Wastewater Facility, Igloolik, Nunavut*. Prepared for the Government of Nunavut. Project No. OTT-00019838-A0. November 19, 2014. Sections 4.4 and 5.

Comment: Section 4.4 of the submitted Design Brief states,

Prior to disposal, sludge must be tested to ensure that the disposal method chosen is safe and environmentally responsible. Sludge removed from the lagoons can be disposed of in a separate cell constructed at the current facility (referred to as Cell No. 4). It is recommended that the sludge undergo at least one freeze-thaw cycle before it is deposited into the landfill. The proposed rehabilitation of the existing lagoons includes the conversion of Cell No. 4 into a sludge holding and disposal cell.

As part of the rehabilitation of the existing lagoons, the sludge accumulated in the lagoons will be removed and deposited in Cell No. 4 prior to the start of the rehabilitation and expansion of the existing cells.

It is not clear whether the Hamlet will rehabilitate a lagoon cell (Cell No. 4) to manage sludge during the rehabilitation of the existing lagoons and for the sewage treatment system in the coming years. The alternative recommended for the expansion and rehabilitation of the sewage treatment system identified in Section 5 of the Design Brief does not reference the use of a lagoon cell for sludge management.

Recom: The Hamlet should confirm whether it will rehabilitate an existing sewage lagoon cell to manage sludge during the rehabilitation of the existing lagoons and throughout the operation of an expanded and rehabilitated sewage treatment system. The Hamlet should receive written Board approval before depositing sludge into a dedicated lagoon cell. It is recommended that the following information be provided before receiving this approval:

- Design drawings of the sludge management lagoon;
- A summary of how the sludge management lagoon will be rehabilitated (e.g., re-enforced berms, lining, etc.);
- How effluent that accumulates within the sludge management lagoon will be managed;
- Drawings that reference the sludge management cell relative to the planned new sewage lagoon and rehabilitated sewage lagoons;
- The testing that will be applied to sewage sludge and criteria for landfill disposal;
- How sludge will be disposed in the landfill.

2. Storage capacity of expanded and rehabilitated sewage treatment system

Source: Exp Services Inc 2014. *Design Brief, Optimization of the Wastewater Facility, Igloolik, Nunavut*. Prepared for the Government of Nunavut. Project No. OTT-00019838-A0. November 19, 2014. Sections 4.4 and 5.

Comment: Section 4.4 of the Design Brief describes the need for the new and rehabilitated lagoons to be designed in a way that will allow for the storage of sludge (settled solids) to ensure that this sludge will not be released to the environment during decanting operations. The document recommends that these lagoons allow 0.5 m of depth for sludge storage. The storage requirements provided in Sections 4.1 and 5 of the Design Brief do not include dedicated volumes for sludge storage within the lagoons (i.e., 124,220 m³ of total storage: 111,570 m³ for effluent storage and 12,650 m³ for precipitation and evaporation).

Recom: The Hamlet should confirm whether the storage of sludge has been considered in the design of the new and rehabilitated sewage lagoons (the operation of a dedicated lagoon cell for excavated sludge is a separate issue).

3. Missing Geotechnical Report

Source: Hamlet of Igloolik, Nunavut. *Water Licence Amendment Application Form*. April 20, 2015. Section 23.

Exp Services Inc 2014. *Design Brief, Optimization of the Wastewater Facility, Igloolik, Nunavut*. Prepared for the Government of Nunavut. Project No. OTT-00019838-A0. November 19, 2014. Section 3.3.

Comment: Section 23 of the submitted Water Licence Amendment Application Form and Section 3.3 of the Design Brief make reference to a geotechnical investigation report that was prepared by Exp Services Inc in 2010 and included in the application. However, a copy of

this report cannot be found on the NWB public registry. Rather, a geotechnical investigation report for proposed sewage lagoon upgrades in Hall Beach has been provided. It appears that this is an oversight made by the Government of Nunavut's Department of Community and Government Services who are acting on the Hamlet's behalf for the purpose of this application.

Recom: The Hamlet should provide a copy of the geotechnical investigation report specific to its planned sewage lagoon upgrades to the NWB for review.

4. Operation and Maintenance Plans

Source: Nunavut Water Board. *Water Licence No. 3BM-IGL1520*. March 15, 2015.

Comment: Part F, Item 1 of water licence No. 3BM-IGL1520, required the Hamlet to submit specific Operations and Maintenance (O&M) Plans to the Board for approval within 90 days of the March 15, 2015 renewal licence (June 13, 2015 deadline). The licence required these submissions because they were not included in the May 2014 licence renewal application. They are as follows:

- a. Sewage Disposal Facility O&M Plan (including the Sewage Sludge Management Plan);
- b. Solid Waste Disposal Facility O&M Plan; and
- c. Spill Contingency Plan

At the time of this review, no O&M Manuals could be found on the NWB public registry.

Recom: If the licence amendment application is approved by the Board, the amended licence should require that the Sewage Disposal Facility O&M Plan and Solid Waste Disposal Facility O&M Plan (sludge disposal) address the planned expansion and rehabilitation to the sewage treatment facility.

Regardless of the submitted licence amendment applications approval status, the Hamlet should provide to the Board for approval the O&M Plans identified in Part F, Item 1 of its water licence. This is required for licence compliance purposes.

Prepared by David Abernethy