



Crown-Indigenous Relations  
and Northern Affairs Canada

Relations Couronne-Autochtones  
et Affaires du Nord Canada

Water Resources Division  
Resource Management Directorate  
Nunavut Regional Office  
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Your file - Votre référence  
3BM-CAM1520

March 25, 2020

Our file - Notre référence  
CIDM#1284396

Richard Dwyer  
Manager of Licensing  
Nunavut Water Board  
P.O. Box 119  
Gjoa Haven, NU, X0B 1J0  
sent via email: [licensing@nwb-oen.ca](mailto:licensing@nwb-oen.ca)

**Re: Crown-Indigenous Relations and Northern Affairs Canada's comments on the Hamlet of Cambridge Bay's renewal application for water licence #3BM-CAM1520 for municipal undertakings – Hamlet of Cambridge Bay**

Dear Mr. Dwyer,

Thank you for your February 25, 2020 invitation for technical review comments on the above referenced application. The Water Resources Division of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application and the results of our review are provided in the enclosed memorandum for the Nunavut Water Board's consideration.

Comments have been provided pursuant to CIRNAC's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. If there are any questions or concerns, please contact me at (867) 975-3876 or by e-mail at [sarah.forte@canada.ca](mailto:sarah.forte@canada.ca).

Sincerely,

Sarah Forté  
Water Management Specialist

## **Technical Review Memorandum**

To: Richard Dwyer, Manager of Licensing, Nunavut Water Board

From: Sarah Forté, Water Management Specialist, Water Resources Division, CIRNAC

Date: March 25, 2020

Re: Crown-Indigenous Relations and Northern Affairs Canada's comments on the Hamlet of Cambridge Bay's renewal application for water licence #3BM-CAM1520 for municipal undertakings – Hamlet of Cambridge Bay

Region: ☒ Kitikmeot ☐ Kivalliq ☐ Qikiqtani

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### **A. BACKGROUND**

On February 25, 2020, the Nunavut Water Board provided notification of the Hamlet of Cambridge Bay's submission of a renewal application for their Type B water licence 3BM-CAM1520 for the use of water and deposit of waste in the Hamlet of Cambridge Bay.

The Hamlet's water source is Water Lake, approximately 3 km to the north of the community, which feeds a new water treatment plant, in operation since 2017. The licensee has recently submitted the Water Treatment Plant Operations and Maintenance Manual, on which Crown-Indigenous and Relations Northern Affairs Canada (CIRNAC) submitted comments on March 5, 2020. There are direct feed pressure lines to schools, the CHARS facility, the Helen Maksagak centre and the Health Centre. All other buildings and residences are serviced by trucked water.

Trucks are also used to collected sewage, which is treated in a system that includes a primary lagoon, a retention lagoon and a wetland. The landfill is adjacent to the lagoon and drains into the same wetland.

The Hamlet is requesting for a 10-year renewal for an increased volume of water using all the same facilities as are authorized under the present licence.

## B. RESULTS OF REVIEW

CIRNAC noted that this application was well prepared. The “Description and explanation” section of the application, as well as the poster detailing waste management improvements in the community, helped us in our review. On behalf of CIRNAC Water Resources, the following comments and recommendations are provided for the Board’s consideration:

### 1. Water quantity requested

#### Comment:

Authorization to withdraw 257 m<sup>3</sup>/day or 94 000 m<sup>3</sup>/year from Water Lake is requested in Box 13 of the application. The executive summary states the winter lake volume is estimated at 650 000 m<sup>3</sup> while the summer lake volume is 1 765 000 m<sup>3</sup>.

The Fisheries and Oceans’ protocol for winter water withdrawal limit is not to exceed 10% of the available water volume. According to the estimate provided, 10% of the winter volume would be 65 000 m<sup>3</sup>, so the requested quantity is 14.5% of the winter volume.

#### Recommendation:

CIRNAC recommends that the Board and proponent contact the department of Fisheries and Oceans’ for further guidance before authorizing or withdrawing the requested quantity of water.

### 2. Water quality at waste management facility

#### Comment:

With their annual reports, the Hamlet has provided the water quality monitoring results required by the water licence more regularly since 2015. This is helpful for evaluating the performance of waste management practises and brings to light some concerns.

As mentioned above, the sewage and solid waste facilities in Cambridge Bay are co-located, and they share some water management features. Section 6.5 of the Solid Waste Disposal Facility Operations and Maintenance (O&M) Manual: “*surface water collecting in control ponds can be pumped into the lagoon.*” The 2018 annual reports confirms this practise is used: “*Sometime waste run-off required to pump out to sewage lagoon when snow melts or rains flooded the waste facility.*” Additionally, surface water draining from the landfill is directed via a ditch to the wetland that also receives treated sewage from the retention lagoon (personal communication, B.Pedersen, March 13, 2020). These features are illustrated in figure C-14 of appendix D in the Solid Waste O&M Manual and the figure below.

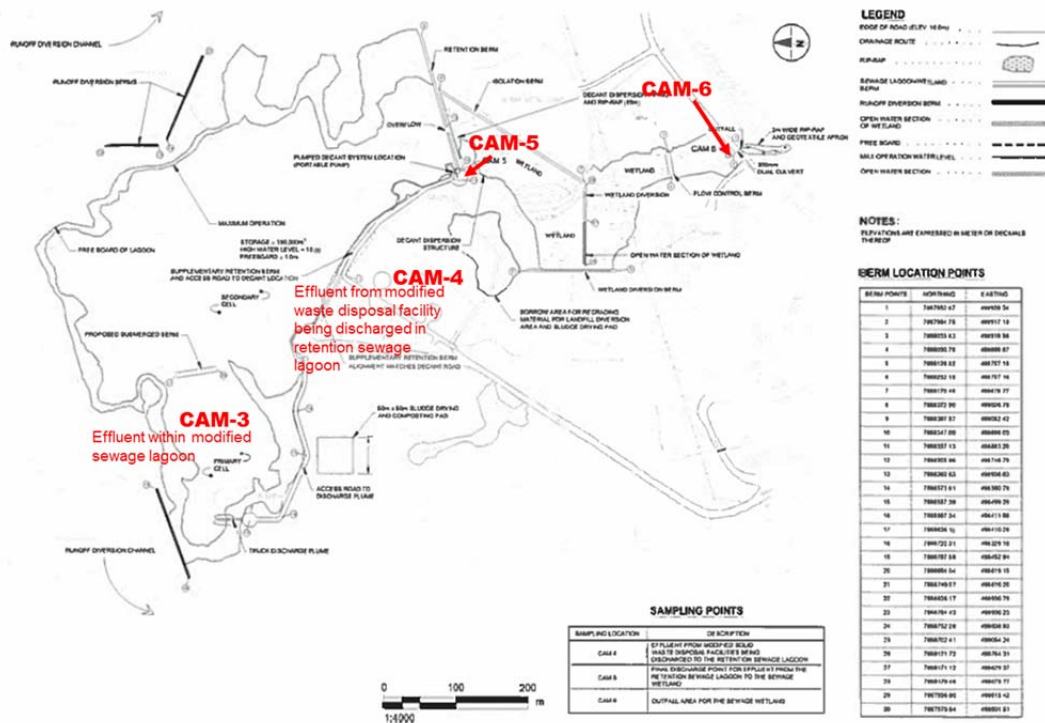


Figure of sampling stations taken from Sewage Lagoon O&M Manual

Part D Item 5 of the current water licence requires sampling at station CAM-5 and sets discharge criteria for station CAM-6. These station locations are identified in the figure above. The licensee has provided water quality results for CAM-5 in 2015, 2016, 2017 and 2018, while results for CAM-6 are available for 2015, 2016 and 2018. Four of the six samples at CAM-6 had pH values outside the 6 - 9 range set by the licence, with values ranging from 9.36-10.20. The treatment through the retention cell causes pH to increase; for 3 of 6 samples, pH is within criteria at CAM-3 in the sewage lagoon and above pH 9.0 at CAM-5, when leaving the retention cell for the same dates.

The water licence has no discharge criteria for metals. However, metal concentrations in the effluent of the waste disposal facility at CAM-4 are elevated, as might be expected from contact water at a landfill. Iron concentrations are on average 10 570 µg/L (range 322 - 24 500 µg/L) and though they are reduced in the wetland, concentrations are still high at the final discharge point CAM-6 (average 544 µg/L, range 301 - 739 µg/L). These iron concentrations are above the Guidelines for the discharge of treated municipal wastewater in the Northwest Territories and the Canadian water quality guidelines for the protection of aquatic life (CWQG-PAL) in freshwater – long term, which are both 300 µg/L. Copper is the other metal with concentrations with concentrations at the final discharge point CAM-6 (average 6.0 µg/L, range 3.4 – 12.6 µg/L) regularly above the CWQG-PAL. The guideline for copper is variable depending on water hardness, and for the samples measured it is almost always 4 µg/L. The 2015 CAM-6 samples also have elevated aluminum, cadmium and lead concentrations, but it was a single occurrence, and concentrations at CAM-4 on the same date are not elevated.

Recommendation:

CIRNAC recommends the licensee explore options to reduce pH of the retention cell effluent to meet licence discharge criteria. Additionally, CIRNAC recommends the licensee explore options to reduce metal concentrations in landfill contact water.

CIRNAC also recommends discharge criteria be re-considered to include metal concentrations if applicable, since the effluent tested is in part from a landfill.

### **3. Licence term**

Comment:

The licensee is requesting their licence be renewed for a 10-year term.

The licensee has diligently been managing waste and water in the Hamlet; submitting annual reports with monitoring results regularly, and has being responsive to the Inspector's requests.

Recommendation:

CIRNAC supports the licensee's request for a 10-year term.

## **C. REFERENCES**

Canadian Environmental Quality Guidelines, Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Ministers of the Environment, 2020.

DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut, Fisheries and Oceans Canada, 2010.

Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories, Northwest Territories Water Board, 1992.

Municipal Solid Waste Disposal Facility Operation and Maintenance Manual, Hamlet of Cambridge Bay, February 2014.

Sewage Lagoon Operation and Maintenance Manual, Hamlet of Cambridge Bay, December 2013.

Water Licence Renewal Application 3BM-CAM1520, Hamlet of Cambridge Bay, GN-CGS, February 3, 2020