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January 7, 2008

Senior Administrative Officer
Hamlet of Cambridge Bay
P.O. Box 16
Cambridge Bay, Nunavut
X0E 0C0

Your file - Votre reference

**Our file - Notre référence
NWB3CAM0207**

Re: Hamlet of Cambridge Bay Water Licence Inspection September 10, 2007.

The following report deals with the Water Licence Inspection conducted on September 10, 2007. I would like to thank Derek Anderson for his time and assistance in the Cambridge Bay municipal water licence inspection.

INAC sent two staff (Ian Rumbolt and Stephen Bathory) to carry out the municipal inspection for Cambridge Bay. At the time of the inspection, the Hamlet of Cambridge Bay water licence had expired so they were operating without a licence, however, the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* states that the terms and conditions of the licence continue to apply. Other issues that were identified during the inspection were similar to last years inspection which were; sewage lagoon, waste segregation, landfill leachate, and Surveillance Network Program (SNP) monitoring.

Potable Water

The Hamlet of Cambridge Bay receives its water from Water Lake which is transferred to the treatment plant by pipeline. A sample was taken near the pump house at Water Lake.

No signs are posted to identify Water Lake as the Hamlets potable water source, and a SNP was not identified for the drinking water source.

Sewage Lagoon

The sewage lagoon is located adjacent to the solid waste storage site (landfill) and upstream of the metal waste site. A considerable amount of garbage was present in and around the sewage lagoon; this should be avoided as much as possible. Installing a fence around the sewage lagoon and/or around the landfill would prevent wind blown garbage from entering the lagoon.

The sewage effluent flows from the lagoon through the metal dump and a series of ponds before it finally enters the ocean. The Hamlet should not allow the mixing of sewage effluent and dump leachate, as it may affect the treatment process for the sewage effluent. A sample was taken at the first discharge point from the lagoon to the first pond.

Landfill

The solid waste storage site or landfill is a burn and bury facility that is located adjacent the lagoon. The landfill does not have a fence around it; therefore garbage is blowing outside of the landfill area and into the sewage lagoon. A fence should be installed to limit the amount of garbage that is being scattered outside of the landfill area. The operation of the landfill has little segregation of the waste, with metals and hazardous materials mixed with general garbage. The Hamlet should segregate the metals and hazardous wastes from the general garbage.

Metal Dump

The metal dump is located just down from the sewage lagoon, where the leachate from the dump is allowed to mix with the sewage effluent. The mixing of the dump leachate and sewage effluent could potentially produce a toxic mixture and reduce biological treatment. A sample was taken further down stream near the culvert; the location of this sample was designated as CAM-3.

Waste Oil

An inspection of the waste oil storage area was not completed at this time; it will be noted for next inspection.

Table 1. Parameters exceeding the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (1992) and CCME Guidelines for Drinking Water and the Protection of Aquatic Life (2003)

Client Sample ID	Sample Type	Sample Collect Date	Parameter Name	Result Flag	Reported Result	Guidelines	Units	Calc MDL
Water Intake	Freshwater	9/10/2007	Silver	<	0.1	0.1	µg/L	0.1
Dump	Wastewater	9/10/2007	Ammonia as Nitrogen		5.01	0.019	mg/L	0.005
Dump	Wastewater	9/10/2007	Nitrate+Nitrite as Nitrogen		0.34	0.06	mg/L	0.01
Dump	Wastewater	9/10/2007	Nitrate as Nitrogen		0.27	0.06	mg/L	0.01
Dump	Wastewater	9/10/2007	Nitrite as Nitrogen		0.07	0.06	mg/L	0.01
Dump	Wastewater	9/10/2007	Copper		4.8	2.0	µg/L	0.3
Dump	Wastewater	9/10/2007	Iron		1710	300	µg/L	50
Dump	Wastewater	9/10/2007	Manganese		67.4	50	µg/L	0.1
Lagoon	Sewage	9/10/2007	Ammonia as Nitrogen		7.32	0.019	mg/L	0.005
Lagoon	Sewage	9/10/2007	Nitrate+Nitrite as Nitrogen		1.95	0.06	mg/L	0.01

Lagoon	Sewage	9/10/2007	Nitrate as Nitrogen		1.78	0.06	mg/L	0.01
Lagoon	Sewage	9/10/2007	Nitrite as Nitrogen		0.17	0.06	mg/L	0.01
Lagoon	Sewage	9/10/2007	Copper		10.9	2.0	µg/L	0.3
Lagoon	Sewage	9/10/2007	Iron		1940	300	µg/L	50
Lagoon	Sewage	9/10/2007	Manganese		58.1	50	µg/L	0.1

Part B: General Conditions

Item 1: The Hamlet has not submitted an annual report for water use or waste discharge since 1997. An excel spreadsheet on the NWB ftp site showed water quantities used from 1996 up to 2000, but no actual reports since 1997. An annual report is a requirement under the licence. A summary of annual operations from 1997 to 2007 should be submitted to the Nunavut Water Board before March 31st 2008.

Item 2: Under the licence the hamlet is required to have a surveillance network program in place for the raw water, sewage lagoon, and solid waste facilities. No signs identifying these sampling sites were found. The Hamlet, with the assistance of the Inspector, should identify the monitoring sites and place signs at those locations.

Part C: Conditions Applying to Water Use

Item 2: Since the Hamlet has not submitted annual reports to the Nunavut Water Board since 1997, it is uncertain how much water is actually used.

Part D: Conditions Applying to Waste Disposal

Item 3: The sewage lagoon has insufficient freeboard and allows continuous discharge into a series of ponds before it reaches the ocean. The Hamlet's sewage has very little retention time within the lagoon which results in little treatment of the sewage wastes (mainly solids) before it enters the ocean.

Item 8: Measures are not in place to ensure leachate from the solid waste and metal waste facilities do not mix with the sewage discharge. Fences should be put up around the sewage disposal and solid waste facilities to ensure the general public or wildlife can not enter these areas and to cut down on the amount of garbage that blows around.

Part E: Conditions Applying to Modification and Construction

Item 1: The Hamlet of Cambridge Bay should submit approved design drawings stamped by a qualified engineer registered in Nunavut prior to any construction activities intended to contain, withhold, divert or retain water or wastes. In the document "Background Report for Water Licence Renewal" by Earth Tech

submitted to the NWB with regards to the water licence renewal on behalf of the Hamlet of Cambridge Bay, detailed design drawings for dams, dykes or other retention structures were not included. Only a few drawings on a satellite base map layout were included, but nothing representative of a detailed engineered drawing.

Part F: Conditions Applying to Operation and Maintenance

Item 1: An Operation and Maintenance plan must be submitted to the NWB for the sewage, solid waste, and metal waste disposal areas with a copy retained by the Hamlet. To my knowledge at this time, the plan has not been submitted and a plan was not available during the inspection.

Part G: Conditions Applying to Abandonment and Restoration

In the document by Earthtech "Background Report for Water Licence Renewal", new sewage and solid waste disposal areas have been proposed. An abandonment and restoration plan must be developed for the old sites and submitted six months prior to the construction of new facilities to replace existing ones and abandonment any facilities.

Part H: Conditions Applying to the Surveillance Network Program

Item 1: In previous inspections, water sampling areas have been designated by the inspector and SAO of Cambridge Bay. However, no signs have been put in place by the Hamlet to provide new inspectors with accurate locations of sample sites. Placement of these signs should be completed before the next sampling season (Summer 2008).

Item 2: The licensee has not been sampling at designated sampling areas CAM-2 or CAM-3, which is monthly during the months of May to August, inclusive.

Item 8 & 9: To my knowledge, quantities have not been measured or recorded for water usage or sewage discharge. These quantities would be included in annual reports which are required under the water licence, but which the Hamlet of Cambridge Bay has not been submitting annually since 1997.

Non-compliance of the Act or Licence

At the time of the inspection the Hamlet of Cambridge Bay had been operating without a water licence, although a renewal application had already been sent to the NWB. The hamlet must provide a Surveillance Network Program for the sampling areas which are designated in the NWB water licence. Signs should be put up identifying the Hamlets potable water supply, both dumps, and the sewage lagoon. Also, fencing should be put in place for the lagoon, landfill, and metal dump to prevent wildlife, and the general public from entering these areas.

Sincerely,

Ian Rumbolt
Water Resources Technician
INAC, Nunavut Region

cc. Nunavut Water Board

Photos



Figure 1. Hamlets potable water supply (Water Lake).



Figure 2. Water is transferred from Water Lake to the treatment plant in town.



Figure 3. Hamlets dumping station for the sewage lagoon.



Figure 4. Metal dump looking from sewage lagoon.