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Your file / Votre référence

Our file / Notre référence
unlicenced

September 24, 2001.

Brian Martin
Senior Administrative Officer
Municipality of Hall Beach
General Delivery
Hall Beach, NU X0A 0K0

July 12, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank yourself for the much appreciated time and assistance provided during the tour of the Municipality's water use and waste disposal facilities. Attached for your records is the Municipal Water Use Inspection Report pertaining to the July 12, 2001 inspection; considering the limited resources at its disposal, the municipality appears to reasonably manage its facilities. However, concerns were noted and will need to be addressed:

- **Water supply:** No concerns were noted in regards to the truckfill station at the newly-built reservoir, or to the quality of the municipal water supply. As such, the attached analytical results relating to a sample collected from the decant station at Water Lake (figure 1) indicate that the raw water meets the *Guidelines for Canadian Drinking Water Quality*, save for a faint exception: a field pH value of 8.8, which rests slightly above the 8.5 aesthetic objective. However, the state of secondary water impoundment structures proved far from ideal and will need to be seen to. Indeed, the western berm of the 'outer' lake, immediately downstream of the decant station, has been breached (figure 2). Further, excessive spring runoff has also created a sizeable breach in the northern berm of the 'inner' lake, which lies between the 'outer' lake and the water reservoir (figure 3). In consequence, it will likely prove impossible to recharge the water reservoir (figure 4) this year. As the reservoir probably does not contain more than two years worth of water supply, the Inspector trusts that Community Government and Transportation (CG&T) will respond to the municipality's requests for suggestions and/or assistance on how to best deal with the matter.

- **Sewage disposal:** The state of the sewage disposal facility also poses some concerns. Both sewage lagoon cells, in particular cell 2 (figure 5), are essentially dried out. In addition, as the contents of sewage lagoon cell 1 (figure 6) was noticeably seeping along the toe of the outer berm, minimal retention time appeared to be provided to the effluent prior to discharge to receiving waters (figure 7).

The attached analytical results relating to a sample taken five metres from the outer berm reveal that levels of ammonia (61.7 mg/L vs 2.2 mg/L) and phenols (40 µg/L vs 4.0 µg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Moreover, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), shows that half of light-producing bacteria were inhibited by a sample concentration of 47.6%, whereas 50% and over is considered non-toxic. This being said, it was mentioned during the inspection that engineer(s) were due to assess the status of the sewage disposal site this summer, and possibly contemplate alternative facilities.

- **Solid waste disposal:** Although combustible waste appears well burned/compacted and periodically covered (figure 8), the completion of the partial perimeter fence would greatly minimize the extent of windblown wastes in the vicinity of the solid waste disposal facility. In regards to waste segregation, assigning a sealift container to the storage of batteries and other hazardous materials would lessen the chance of contaminants being accidentally deposited into water. Lastly, the significant volume of runoff flowing along the toe of the solid waste disposal facility potentially implies leachate considerations. Nonetheless, the Microtox sample collected downstream of the toe of the dump (figure 9) did not attribute toxicity to the effluent, and concentrations of only copper (30 µg/L vs 4.0 µg/L) and iron (1.06 mg/L vs 0.3 mg/L) exceeded the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*.

- **Non-compliance of Act:** The Municipality does not currently hold the Water licence it requires for its water use and waste disposal. However, it was related at the time of the inspection that the municipality had already initiated the application process, but was awaiting assistance from third parties to complete certain sections of the Nunavut Water Board (NWB) questionnaires. Accordingly, the Inspector wishes to remind the municipality and other implicated agencies that a Water licence represents a requirement under both the *Northwest Territories Waters Act* and the *Nunavut Land Claims Agreement*.

Please feel free to contact me at (867) 975-4298 or lavallcep@inac.gc.ca should any questions/comments arise.

Sincerely,

Philippe Lavallée
Water Resources Officer
INAC, Nunavut District

c.c. - Nunavut Water Board, Gjoa Haven
- CG&T, Iqaluit (Doug Sitland)
- Baffin Health & Social Services, Iqaluit (Shaun Mackie)
- EC Environmental Protection, Yellowknife (Anne Wilson)

Indian and Northern Affairs Canada / Affaires Indiennes et du Nord Canada

MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/07/12 **Licensee Rep.** (Name/Title): Brian Martin / SAO

Licensee: **Municipality of Hall Beach** **Licence No.:** **unlicenced**

WATER SUPPLY

Source(s): Water Lake / Reservoir **Quantity used:** meter @ 65 911 800 L

Owner:/Operator: DND-GN/Municipality

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Intake Facilities: A **Storage Structure:** U **Treatment Systems:** A **Chemical Storage:** A

Flow Meas. Device: A **Convey. Lines:** NA **Pumping Stations:** A

Comments: No concerns noted in regards to the truckfill station at the recently-built reservoir. Abundant spring runoff brought on breaches of secondary water impoundment structures; may be impossible to recharge the water reservoir this year. Chlorination in use. Filtration system no longer operated since malfunction; outside resources required to correct the problem.

WASTE DISPOSAL

Sewage: **Sewage Treatment System** (Prim./Sec/Ter.): primary; discharge overland to ocean

Natural Water Body: **Continuous Discharge** (land or water):

Seasonal Discharge: x **Wetlands Treatment:** **Trench:**

Solid Waste: **Owner/Operator:** GN/Municipality

Landfill: **Burn & Landfill:** x **Other:**

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Discharge Quality: sampled **Decant Structure:** NA **Erosion:** A

Discharge Meas. Device: none **Dyke Inspection:** NA **Seepages:** U

Dams, Dykes: A **Freeboard:** U **Spills:** none reported

Construction: NA **O&M Plan:** NA **A&R Plan:** NA

Periods of Discharge: A **Effluent Discharge Rate:** not measured

Comments: Sewage lagoon cells almost completely dried out; retention time apparently minimal. Abundant seepage noted; effluent flow bypasses drainage ditch. Partly-fenced solid waste disposal facility appears well managed; wastepile burnt regularly, covered on annual basis. Bulky metal wastes are segregated; old site along the shoreline and active site near the solid waste disposal facility. No particular storage/disposal area for hazardous materials; batteries and waste oil drums present in various areas. Significant volume of runoff flows along the toe of the solid waste disposal facility.

FUEL STORAGE

Owner/Operator:

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Berms & Liners: **Water within Berms:** **Evidence of Leaks:**

Drainage Pipes: **Pump Station & Catchment Berm:**

Pipeline Condition: **Not Applicable:** x **Condition of Tanks:**

SURVEILLANCE NETWORK PROGRAM (SNP)

Samples Collected **Hamlet:** none

INAC: raw water, sewage discharge, dump leachate

Signs Posted **SNP:** not applicable **Warning:** none

Records & Reporting: none required

Geotechnical Inspection: none required; may be warranted due to excessive seepage from the lagoon cells

Non-Compliance of Act or Licence: Community is unlicenced, but application process has been initiated; awaiting assistance from governmental agencies to complete the required questionnaires.

Philippe Lavallée

Inspector's Name **Inspector's Signature**

figure 1. Decant station at outlet of Water Lake; 2001/07/12.

figure 2. Breached berm along western face of the 'outer' lake; 2001/07/12.

figure 3. Breached berm along the northern face of the 'inner' lake; 2001/07/12.

figure 4. Water reservoir, with truckfill station in background; 2001/07/12.

figure 5. Sewage lagoon cell 2; 2001/07/12.

figure 6. Sewage lagoon cell 1; 2001/07/12.

figure 7. Path of effluent discharge from the sewage disposal facility; 2001/07/12.

figure 8. Solid waste disposal facility, with bulky wastes in background; 2001/07/12.

figure 9. Runoff flowing along the toe of the solid waste disposal site; 2001/07/12.

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
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Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Hall Beach Raw Water **Taiga Sample ID: 211511**

Client Project: **Sample Type:** Sewage **Received Date:** 13-Jul-01

Location: Hall Beach **Sampling Date:** 12-Jul-01

Report Status: **Final** ***Approved by:***

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Chloride	11.2	mg/L	0.2	21-Jul-01
	Sodium	6.80	mg/L	0.02	20-Jul-01
	Sulphate	3	mg/L	3	07-Aug-01
Microbiology	Coliforms, Fecal	<1	CFU/100mL	1	13-Jul-01
Nutrients	Ammonia as N	0.013	mg/L	0.005	17-Jul-01
	Biological Oxygen Demand	3	mg/L	2	13-Jul-01
	Nitrate+Nitrite as N	<0.008	mg/L	0.008	31-Jul-01
Physicals	Colour	<5		5	16-Jul-01
	Solids, Total Dissolved	102	mg/L	10	25-Jul-01
	Turbidity	0.5	NTU	0.1	16-Jul-01
Total Metals	Arsenic	1.3	µg/L	1.0	30-Jul-01
	Cadmium	<0.3	µg/L	0.3	19-Jul-01
	Chromium	<3	µg/L	3	19-Jul-01

Report Date: August 9, 2001

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Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Hall Beach Raw Water **Taiga Sample ID: 211511**

Total Metals	Cobalt	<1	µg/L	1	19-Jul-01
	Copper	4	µg/L	2	19-Jul-01
	Iron	202	µg/L	30	27-Jul-01
	Lead	<1	µg/L	1	19-Jul-01
	Manganese	1	µg/L	1	19-Jul-01
	Mercury	<0.01	µg/L	0.01	03-Aug-01
	Nickel	<1	µg/L	1	19-Jul-01
	Zinc	217	µg/L	10	19-Jul-01

Field Data (01/07/12) raw water
Temperature: 14.5 °C
Conductivity: 163 µS/cm
pH: 8.8 **Time:** 14:26

Report Date: August 9, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations **Attn:** Philippe Lavalllee

Sample ID: Hall Beach Lagoon Discharge **Taiga Sample ID:** 211513

Client Project: **Sample Type:** sewage **Received Date:** 13-Jul-01

Location: Hall Beach **Sampling Date:** 12-Jul-01

Report Status: **Final** ***Approved by:***

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Microbiology	Coliforms, Fecal	15000	CFU/100mL	1	13-Jul-01	
Nutrients	Ammonia as N	61.7	mg/L	0.005	17-Jul-01	
	Biological Oxygen Demand	108	mg/L	2	13-Jul-01	
	Phosphorous, Total	2.86	mg/L	0.004	17-Jul-01	
Organic	Phenols	40	µg/L	2	19-Jul-01	
Physicals	Solids, Total Suspended		mg/L	3	25-Jul-01	14

Data Qualifier Descriptions:

14 Insufficient sample to perform analysis

Field Data (01/07/12) lagoon
Temperature: 14.0 °C
Conductivity: 1 805 µS/cm
pH: 7.9 Time: 15:42

Report Date: Friday, July 27, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Hall Beach Lagoon Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 12, 2001

Date/Time Received: N/A

Date/Time Test Start: July 17, 2001

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance with November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

RESULTS: **TOXIC - iC_{50} Concentration: 47.6%** **(Toxic 0 to 50%)** **(Slightly Toxic 50 to 90%)**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: 8.5 (No pH adjustment)

Sample Appearance: Clear, no colour adjustment

Lot # of OAS: OSA007
(Osmotic Adjusting Solution)

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: July 17, 2001 / 12:33 PM

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Analyst: RB

Date of Test: July 17, 2001

Reagent Lot #: ACV022-2

IC_{50} - 15 minutes mg/L: 3.1 mg/L

IC_{50} Confidence Range: 2.4 to 4.0 mg/L

TEST ANALYST: Ron Bujold

INITIAL: R.B.

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Hall Beach Dump Leachate **Taiga Sample ID:** 211512

Client Project: **Sample Type:** sewage **Received Date:** 13-Jul-01

Location: Hall Beach **Sampling Date:** 12-Jul-01

Report Status: **Final** *Approved by:*

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Nutrients	Ammonia as N	1.44	mg/L	0.005	17-Jul-01	
Organic	Oil and Grease	1.0	mg/L	0.2	30-Jul-01	
Physicals	Solids, Total Suspended		mg/L	3	25-Jul-01	14
Total Metals	Arsenic	< 1.0	µg/L	1.0	30-Jul-01	
	Cadmium	< 0.3	µg/L	0.3	19-Jul-01	
	Chromium	< 3	µg/L	3	19-Jul-01	
	Cobalt	< 1	µg/L	1	19-Jul-01	
	Copper	30	µg/L	2	19-Jul-01	
	Iron	1060	µg/L	30	27-Jul-01	
	Lead	3	µg/L	1	19-Jul-01	
	Manganese	48	µg/L	1	19-Jul-01	
	Mercury	< 0.01	µg/L	0.01	03-Aug-01	
	Nickel	3	µg/L	1	19-Jul-01	

Report Date: August 9, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations *Attn:* Philippe Lavalllee

Sample ID: Hall Beach Dump Leachate **Taiga Sample ID:** 211512

Total Metals	Zinc	24	µg/L	10	19-Jul-01

Data Qualifier Descriptions:

14 Insufficient sample to perform analysis

Field Data (01/07/12) **dump**
Temperature: 16.5 °C
Conductivity: 587 µS/cm
pH: 8.0 **Time:** 15:14

Report Date: August 9, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Hall Beach Dump Leachate**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 12, 2001

Date/Time Received: N/A

Date/Time Test Start: July 17, 2001

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance with November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

RESULTS: **NON TOXIC at 45% Concentration**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: 8.3 (No pH adjustment)

Sample Appearance: Clear, no colour adjustment

Lot # of OAS: OSA007
(Osmotic Adjusting Solution)

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: July 17, 2001 / 12:52 PM

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Analyst: RB

Date of Test: July 17, 2001

Reagent Lot #: ACV022-2

IC_{50} - 15 minutes mg/L: 3.1 mg/L

IC_{50} Confidence Range: 2.4 to 4.0 mg/L

TEST ANALYST: Ron Bujold

INITIAL: R.B