Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

INAC, Nunavut District Office
P.O. Box 100
Iqaluit, NU
X0A 0H0

tel.: (867) 975-4275
fax.: (867) 979-6445

Your file Votre référence

Our file Notre référence
N7L4-1526

October 3, 2001.

John Holland
Senior Administrative Officer
Hamlet of Kugluktuk
P.O. Box 27
Kugluktuk, NU X0E 0E0

August 9, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank Phillip Katak for the much appreciated time and assistance provided during the tour of the Hamlet's water use and waste disposal facilities. Attached for your records is the Municipal Water Use Inspection Report pertaining to the August 9, 2001 inspection; in general, the facilities appear adequately managed. Nonetheless, the following considerations were noted:

- **Water supply:** Several improvements to the water supply system were noted, and as such appear to alleviate much of the complications and difficulties experienced in the recent past. This being said, the attached analytical results relating to a raw water sample taken from Surveillance Network Program (SNP) station 1526-1, in the vicinity of the intake facilities (figure 1), indicate that field pH (9.1 vs 8.5), turbidity (10.9 Nephelometric Turbidity Units (NTU) vs 5 NTU) and iron (458 μg/L vs 300 μg/L) exceed the aesthetic objectives set under the *Guidelines for Canadian Drinking Water Quality*.

- **Sewage disposal:** The fairly limited capacity of the sewage disposal facility (figure 2) restricts the retention and treatment time provided to sewage effluent prior to its release to receiving waters. Accordingly, the attached analytical results relating to a sample collected from Surveillance Network Program (SNP) station 1526-2 (figure 3) reveal noteworthy levels of faecal coliform (1 470 000 CFU/100ml), as well as concentrations of ammonia (49 mg/L vs 2.2 mg/L) and phenols (100 μg/L vs 4 μg/L) exceeding 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 6.4%, whereas 50% and over is considered non-toxic. In light of this, even if the abundant vegetation along the discharge path likely provides significant effluent treatment, efforts should be taken to increase the retention time prior to discharge from the sewage disposal facility.

- **Solid waste disposal:** At the time of the inspection, runoff from the pooled water at the toe of the solid waste disposal facility (figure 4) was observed flowing onto the marshy area beyond. Thus, the attached analytical results relating to a runoff sample taken from SNP station 1526-4 indicate that concentrations of iron (983 µg/L vs 300 µg/L) and zinc (79 µg/L vs 30 µg/L) slightly exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*; however the microtox sample did not attribute toxicity to the leachate. In related matters, waste undergoes considerable segregation; bulky metal wastes are set aside (figure 5), as are hazardous materials and waste oil (figure 6). In addition, above current storage practices, the Licensee is contemplating means of disposal for hazardous materials and waste oil.

- **Non-compliance of Act or Licence:** Although assistance, in the form of annual report templates, has been provided to the Licensee, no Annual Report has been submitted since 1996. This recurring violation of Water licence N7L4-1526 (part A, item 3) is unacceptable, as these reports constitute the foremost source of information regarding municipal water uses and waste disposals available to the Nunavut Water Board (NWB) and regulatory agencies. Consequently, the Inspector urges the Licensee to, without delay, provide the NWB with the outstanding reports, and trusts that no further prompting will be required to bring the Licensee back into compliance with the terms and conditions of Water licence N7L4-1526.

Please feel free to contact me at (867) 975-4298 or lavalleep@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, Cambridge Bay (Sherif El-Attar)
- Kitikmeot Health & Social Services, Cambridge Bay (Robert Phillips)
- EC Environmental Protection, Yellowknife (Anne Wilson)

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MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/08/09 **Licensee Rep.** (Name/Title): Phillip Katak / Foreman

Licensee: Hamlet of Kugluktuk **Licence No.:** N7L4-1526

WATER SUPPLY

Source(s): Coppermine River **Quantity used:** recorded @ truck delivery

Owner:/Operator: GN/Hamlet

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

Intake Facilities: A	**Storage Structure:** A	**Treatment Systems:** A	**Chemical Storage:** A
Flow Meas. Device: NA	**Convey. Lines:** A	**Pumping Stations:** A	

Comments: New water intake facility working well; two intakes at different depth enable the pumping of water without salinity complications, regardless of tides. Plans to mount a standby hard-suction pipe for springtime. Currently in the process of cleaning one of the storage tanks. Plans to install a filtration system; chlorination already in use. Meter at old intake facility unaccessible; will replace.

WASTE DISPOSAL

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

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

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

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

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:** A
Dams, Dykes: NA	**Freeboard:** NA	**Spills:** none reported
Construction: NA	**O&M Plan:** NA	**A&R Plan:** NA
Periods of Discharge: A	**Effluent Discharge Rate:** not measured	

Comments: Sewage effluent flows over the gravel retention berm; abundant vegetation along the discharge path. Significant segregation of wastes at the solid waste disposal facility. Perimeter fence partly torn down; replacement awaited on the summer's sealift. Wastepile covered twice per year (spring and fall). Pooled water and marshy area along the toe of the dump.

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 (1526-1), sewage discharge (1526-2), dump runoff (1526-4)

Signs Posted **SNP:** none **Warning:** yes

Records & Reporting: No 1997, 1998, 1999, 2000 Annual Reports

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: Licensee had not submitted any Annual Report since 1996.

Philippe Lavallée

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

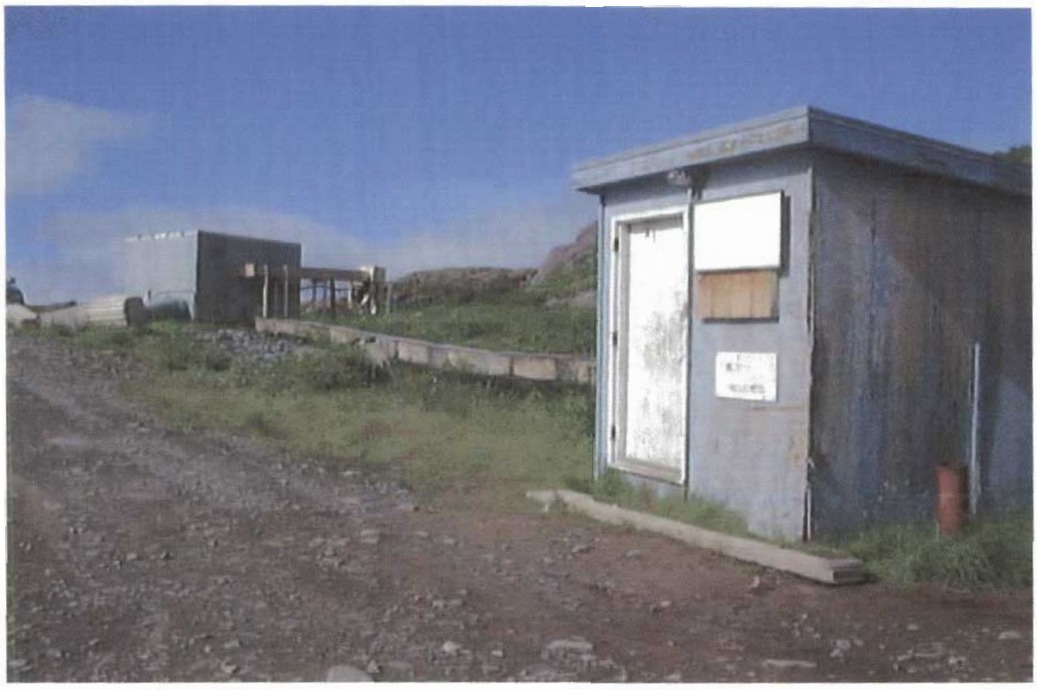

figure 1. Water intake facilities; 2001/08/09.

figure 2. Sewage disposal facility; 2001/08/09.

figure 3. Discharge from the sewage disposal facility; 2001/08/09.

figure 4. Pooled water at the toe of the solid waste disposal facility; 2001/08/09.

figure 5. Bulky metal wastes disposal site, with dump in background; 2001/08/09.

figure 6. Hazardous materials storage site, with landfarm in background; 2001/08/09.

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water 1526-1 **Taiga Sample ID:** 212076

Client Project: **Sample Type:** raw water **Received Date:** 15-Aug-01

Location: Kugluktuk **Sampling Date:** 09-Aug-01

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

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Sodium	9.52	mg/L	0.02	21-Aug-01
Microbiology	Coliforms, Fecal	1	CFU/100mL	1	15-Aug-01
Nutrients	Ammonia as N	0.008	mg/L	0.005	30-Aug-01
	Biological Oxygen Demand	<2	mg/L	2	15-Aug-01
	Nitrate+Nitrite as N	0.012	mg/L	0.008	21-Aug-01
Physicals	Colour	<5		5	15-Aug-01
	Solids, Total Dissolved	80	mg/L	10	04-Sep-01
	Turbidity	10.9	NTU	0.1	15-Aug-01
Subcontract	Chloride	17.0	mg/L	0.1	13-Sep-01
	Sulphate	5.5	mg/L	0.3	13-Sep-01
Total Metals	Arsenic	<1.0	µg/L	1	07-Sep-01
	Cadmium	<0.3	µg/L	0.3	21-Aug-01

Report Date: September 25, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water 1526-1 **Taiga Sample ID:** 212076

Total Metals	Chromium	<3	µg/L	3	21-Aug-01
	Cobalt	<1	µg/L	1	21-Aug-01
	Copper	2	µg/L	2	21-Aug-01
	Iron	458	µg/L	30	20-Aug-01
	Lead	<1	µg/L	1	21-Aug-01
	Manganese	17	µg/L	1	21-Aug-01
	Mercury	<0.01	µg/L	0.01	13-Sep-01
	Nickel	3	µg/L	1	21-Aug-01
	Zinc	<10	µg/L	10	21-Aug-01

Field Data (01/08/09) **1526-1**
Temperature: 13.5 °C
Conductivity: 147 µS/cm
pH: 9.1 **Time:** 14:16

Report Date: September 25, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: Sewage Discharge 1526-2 **Taiga Sample ID:** 212078

Client Project: **Sample Type:** sewage **Received Date:** 15-Aug-01

Location: Kugluktuk **Sampling Date:** 09-Aug-01

Report Status: Final *Approved by:*

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Microbiology	Coliforms, Fecal	1470000	CFU/100mL	1	16-Aug-01
Nutrients	Ammonia as N	49.0	mg/L	0.005	30-Aug-01
	Biological Oxygen Demand	104	mg/L	2	15-Aug-01
	Nitrate+Nitrite as N	0.008	mg/L	0.008	14-Sep-01
	Phosphorous, Total	7.00	mg/L	0.004	13-Sep-01
Physicals	Solids, Total Suspended	123	mg/L	3	04-Sep-01
Subcontract	Phenols	100	µg/L	2	13-Sep-01

Field Data (01/08/09) **1526-2**
Temperature: 14.5 °C
Conductivity: 782 µS/cm
pH: 7.6 **Time:** 14:49

Report Date: Monday, September 24, 2001

REPORT OF TOXICITY USING MICROTOX

COMP. //LOCATION: **Kugluktuk, 1526-2 Lagoon Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 9, 2001, 14:49

Date/Time Received: N/A

Date/Time Test Start: August 15, 2001, 1:21 PM

Sample Type: Elutriate
Sampling Method: Grab

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

Environment Canada has conducted testing on the material sampled according to its own Microtox standards an procedures. The data proceeding from that testing is intended as a preliminary screening tool only, and cannot b used for any other purpose. This data is provided on the condition that it not be used in any report that is intende for public or official use.

RESULTS: **TOXIC - IC_{50} Concentration: 6.4%** **(Toxic 0 to 50%)**

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

TEST SUBSTANCE/CONDITIONS

pH of Sample: 6.6 (No pH adjustment)

Sample Appearance: Clear, no colour adjustment

Lot # of Osmotic Adjusting Solution: OAS007

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: August 15, 2001 / 1:21 PM

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

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Reagent Lot #: ACV026-6

IC_{50} - 15 minutes mg/L: 2.4 mg/L

IC_{50} Confidence Range: 1.6 to 3.6 mg/L

TEST ANALYST: Ron Bujold

INITIAL: _____

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: dump leachate 1526-4 **Taiga Sample ID:** 212077

Client Project: **Sample Type:** dump leachate **Received Date:** 15-Aug-01

Location: Kugluktuk **Sampling Date:** 09-Aug-01

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

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Nutrients	Ammonia as N	1.96	mg/L	0.005	30-Aug-01
	Nitrate+Nitrite as N	0.619	mg/L	0.008	21-Aug-01
Organic	Oil and Grease	0.9	mg/L	0.2	18-Aug-01
Physicals	Solids, Total Suspended	18	mg/L	3	04-Sep-01
Total Metals	Arsenic	<1.0	µg/L	1	07-Sep-01
	Cadmium	<0.3	µg/L	0.3	21-Aug-01
	Chromium	<3	µg/L	3	21-Aug-01
	Cobalt	2	µg/L	1	21-Aug-01
	Copper	9	µg/L	2	21-Aug-01
	Iron	983	µg/L	30	20-Aug-01
	Lead	<1	µg/L	1	21-Aug-01
	Manganese	342	µg/L	1	21-Aug-01
	Mercury	<0.01	µg/L	0.01	13-Sep-01
	Nickel	12	µg/L	1	21-Aug-01
	Zinc	79	µg/L	10	21-Aug-01

Field Data (01/08/09) **1526-4**
Temperature: 13.0 °C
Conductivity: 2 630 µS/cm
pH: 6.9 **Time:** 15:13

Report Date: Monday, September 24, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **Kugluktuk, 1526-2, Lagoon Discharge, 2001 August 09, 13:13pm**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 09, 2001 13:13

Date/Time Received: August 15, 2001

Date/Time Test Start: August 15, 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.***

Environment Canada has conducted testing on the material sampled according to its own Microtox standards and procedures. The data proceeding from that testing is intended as a preliminary screening tool only, and cannot be used for any other purpose. This data is provided on the condition that it not be used in any report that is intended for public or official use.

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

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

TEST SUBSTANCE/CONDITIONS

pH of Sample: (No pH adjustment)

Sample Appearance: no colour adjustment

Lot # of Osmotic Adjusting Solution: OAS007

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: August 15, 2001 / 01:23 PM

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

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Reagent Lot #: ACV026-6

IC_{50} - 15 minutes mg/L: 2.4 mg/L

IC_{50} Confidence Range: 1.6 to 3.6 mg/L

TEST ANALYST: Ron Bujold

INITIAL: RB