INAC, Nunavut District Office
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Your file / Votre référence

Our file / Notre référence

unlicenced

November 5, 2001.

Darren Flynn
Senior Administrative Officer
Hamlet of Arviat
P.O. Box 150
Arviat, NU X0C 0E0

INTERNAL
PC
LA
OM
TA

August 30, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank Mike Gibbons 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 30, 2001 inspection; although some outstanding issues were noted, no major concerns regarding the facilities were encountered. Thus, the following considerations were outlined and will need to be addressed:

- **Water supply:** No concerns were noted regarding the municipal water supply facilities. Further, the completion of the work on the second reservoir ought to provide the Hamlet with an adequate supply of potable water for the foreseeable future. This being said, the attached analytical results relating to a sample taken from the first reservoir, while revealing the undesirable presence of faecal coliform, otherwise indicate that all tested parameters meet the *Guidelines for Canadian Drinking Water Quality*, save for turbidity: the recorded value of 3.0 Nephelometric Turbidity Unit (NTU) hovers between the 1 NTU maximum acceptable concentration and the 5 NTU aesthetic objective.

- **Sewage disposal:** While the sewage disposal facility reportedly came near to overtopping during springtime, an adequate freeboard was maintained at the time of the inspection (figure 1). Accordingly, fairly extensive seepage was noted along practically the entire length of the sewage disposal facility's permeable berm (figure 2). Thus, the attached analytical results relating to a sample collected from the main vein of seepage (figure 3) reveal that concentrations of ammonia (122 mg/L vs 2.2 mg/L) and phenol (22 μg/L vs 4 μg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Nevertheless, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), did not attribute toxicity to the sewage effluent discharge. In addition, the abundant vegetation growth noticeable along the path of discharge from the sewage disposal facility likely further contributes to the treatment of the effluent.

- **Solid waste disposal:** Although combustible household wastes appear well compacted and covered (figure 4), a noteworthy amount of windblown waste was noted beyond the perimeter of the partly-fenced solid waste disposal facility. Furthermore, a significant volume of pooled water was observed along the toe of the wastepile stretching towards the sewage disposal facility (figure 5). Consequently, channels of stagnant runoff were also noted along the outer face of the facility's downslope berm (figure 6). Moreover, water has also pooled along the opposite extremity of the wastepile (figure 7). As such, the attached analytical results relating to a sample taken from a pond adjacent to the far end of the facility (figure 8) indicate that concentrations of ammonia (29.4 mg/L), arsenic (5.1 µg/L vs 5.0 µg/L), copper (5 µg/L vs 4 µg/L), iron (844 µg/L vs 300 µg/L), and zinc (61 µg/L vs 30 µg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. However, the associated Microtox sample did not denote toxicity. Given these results, it would appear that leachate may be seeping through sections of the solid waste disposal facility's containment berms.

In related matters, it was mentioned that the Hamlet plans, before the fall freeze up, to compact the sprawled bulky metal wastes disposal site (figure 9). In parallel, it was again suggested that a sealift container be utilised to provide a means of containment prior to proper disposal for batteries and other hazardous materials which are segregated at the site.

- **Non-compliance of Act or Licence:** The Hamlet still does not hold the Water licence it requires under both the *Northwest Territories Waters Act* and the *Nunavut Land Claims Agreement* for its municipal water use and waste disposal. In this regards, the Inspector requested, following the previous inspection, that the Nunavut Water Board (NWB) provide the Hamlet with the information it required in order to process the community's Water licence application. Whereas the NWB provided this on 2001/06/19, the Hamlet has yet to submit the necessary material. In light of this, since the Hamlet reportedly recognizes the importance of a Water licence, the Inspector trusts that it will tackle this issue without further prompting.

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, Rankin Inlet (Don Forsyth)
- Keewatin Health & Social Services, Rankin Inlet (Wanda Poirier)
- EC Environmental Protection, Yellowknife (Anne Wilson)

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

MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/08/30 **Licensee Rep.** (Name/Title): Mike Gibbons / Foreman

Licensee: **Hamlet of Arviat** **Licence No.:** **unlicenced**

WATER SUPPLY

Source(s): Wolf Creek / reservoirs **Quantity used:** pump 1 @ 218 019 600 L
pump 2 @ 306 587 200 L

Owner:/Operator: Hamlet

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

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

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

Comments: No concerns noted with the water supply facilities. Work on the second reservoir completed; currently in use. Both reservoirs recently refilled. Chlorination in use.

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:** x **Trench:**

Solid Waste: **Owner/Operator:** 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:** U

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

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

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

Comments: Various channels of seepage noted along the permeable berm of the sewage disposal facility; level within the lagoon reportedly lowered since springtime. Considerable quantity of windblown waste observed beyond the partly-fenced perimeter of the solid waste disposal facility. Combustible household wastes are pushed towards the toe of the wastepile before being burnt; compacted and covered once per year in late summer / early fall. Hazardous materials are segregated at the bulky metal wastes disposal site; however no form of containment is provided. Waste oil is stored by the Hamlet garage until its disposal is handled by a third party equipped with a furnace. Significant amount of pooled water noted along the toe of the wastepile; leachate appears to be seeping through two sections of the solid waste disposal facility's berms.

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 @ first reservoir, sewage discharge, dump leachate

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

Records & Reporting: not applicable

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: Community is unlicenced.

Philippe Lavallée

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

figure 1. Sewage disposal facility, with truck dumping point in background; 2001/08/30.

figure 2. Seepage along the sewage disposal facility's permeable berm; 2001/08/30.

figure 3. Main vein of seepage from the sewage disposal facility; 2001/08/30.

figure 4. Solid waste disposal facility; 2001/08/30.

figure 5. Pooled water along the toe of the solid waste disposal facility; 2001/08/30.

figure 6. Runoff from the solid waste disposal facility; 2001/08/30.

figure 7. Pooled water along the toe of the solid waste disposal facility; 2001/08/30.

figure 8. Pond adjacent to the solid waste disposal facility; 2001/08/30.

figure 9. Bulky metal wastes disposal site; 2001/08/30.

Taiga Environmental Laboratory
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- CERTIFICATE OF ANALYSIS -

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

Sample ID: raw water **Taiga Sample ID:** 212337

Client Project: **Sample Type:** freshwater **Received Date:** 31-Aug-01

Location: Arviat **Sampling Date:** 30-Aug-01

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

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	5		5	31-Aug-01
Solids, Total Dissolved	29	mg/L	10	13-Sep-01
Turbidity	3.0	NTU	0.1	31-Aug-01
Nutrients				
Ammonia as N	0.065	mg/L	0.005	12-Sep-01
Biological Oxygen Demand	2	mg/L	2	30-Aug-01
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	24-Sep-01
Major Ions				
Sodium	6.21	mg/L	0.02	05-Sep-01
Microbiology				
Coliforms, Fecal	1	CFU/100mL	1	31-Aug-01
Metals, Total				
Arsenic	< 1.0	µg/L	1.0	14-Sep-01
Cadmium	< 0.3	µg/L	0.3	12-Sep-01
Chromium	< 3	µg/L	3	12-Sep-01

Report Date: Wednesday, October 10, 2001

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Sample ID: raw water **Taiga Sample ID:** 212337

Cobalt	<1	µg/L	1	12-Sep-01
Copper	<2	µg/L	2	12-Sep-01
Iron	100	µg/L	30	14-Sep-01
Lead	<1	µg/L	1	12-Sep-01
Manganese	7	µg/L	1	12-Sep-01
Mercury	<0.01	µg/L	0.01	02-Oct-01
Nickel	<1	µg/L	1	12-Sep-01
Zinc	<10	µg/L	10	12-Sep-01
Subcontracted Tests				
Chloride	12.0	mg/L	0.1	05-Oct-01
Sulphate	3.4	mg/L	0.3	05-Oct-01

Field Data (01/08/30) **raw water**
Temperature: 13.0 °C
Conductivity: 73 µS/cm
pH: 8.5 **Time:** 11:34

Report Date: Wednesday, October 10, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: sewage discharge **Taiga Sample ID:** 212335

Client Project: **Sample Type:** freshwater **Received Date:** 31-Aug-01

Location: Arviat **Sampling Date:** 30-Aug-01

Report Status: **Final** ***Approved by:*** Kathy Pyl

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Physicals					
Solids, Total Suspended	80	mg/L	3	11-Sep-01	
Nutrients					
Ammonia as N	122	mg/L	0.005	12-Sep-01	
Biological Oxygen Demand		mg/L		25-Sep-01	10
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	24-Sep-01	
Phosphorous, Total	11.5	mg/L	0.004	26-Sep-01	
Microbiology					
Coliforms, Fecal	10000	CFU/100mL	1	31-Aug-01	
Subcontracted Tests					
Phenols	22.0	µg/L	0.5	05-Oct-01	

Data Qualifier Descriptions:

10 Analyst error, unable to repeat measurement

Field Data (01/08/30) sewage
Temperature: 11.5 °C
Conductivity: 1 213 µS/cm
pH: 7.2 **Time:** 10:40

Report Date: Friday, October 12, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY LOCATION: **Arviat - Sewage Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 30, 2001

Date/Time Received: September 04, 2001

Date/Time Test Start: September 04, 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: N/A (No pH adjustment)

Sample Appearance: Greenish, 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: September 04, 2001 / 11:51 AM

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: 3.4 mg/L

IC_{50} Confidence Range: 1.8 to 6.8 mg/L

TEST ANALYST: Wade Romanko **INITIAL:** WR

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: dump leachate **Taiga Sample ID:** 212336

Client Project: **Sample Type:** wastewater **Received Date:** 31-Aug-01

Location: Arviat **Sampling Date:** 30-Aug-01

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

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Solids, Total Suspended	36	mg/L	3	11-Sep-01
Nutrients				
Ammonia as N	29.4	mg/L	0.005	12-Sep-01
Nitrate+Nitrite as N	0.040	mg/L	0.008	24-Sep-01
Organic				
Oil and Grease	1.7	mg/L	0.2	27-Sep-01
Metals, Total				
Arsenic	5.1	µg/L	1.0	14-Sep-01
Cadmium	< 0.3	µg/L	0.3	12-Sep-01
Chromium	7	µg/L	3	12-Sep-01
Cobalt	2	µg/L	1	12-Sep-01
Copper	5	µg/L	2	12-Sep-01
Iron	844	µg/L	30	14-Sep-01
Lead	2	µg/L	1	12-Sep-01
Manganese	939	µg/L	1	12-Sep-01

Report Date: Wednesday, October 10, 2001

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- CERTIFICATE OF ANALYSIS -

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

Sample ID: dump leachate **Taiga Sample ID:** 212336

Mercury	< 0.01	µg/L	0.01	02-Oct-01
Nickel	7	µg/L	1	12-Sep-01
Zinc	61	µg/L	10	12-Sep-01

Field Data (01/08/30) **dump**
Temperature: 10.5 °C
Conductivity: 1 893 µS/cm
pH: 8.1 **Time:** 11:00

Report Date: Wednesday, October 10, 2001

REPORT OF TOXICITY USING MICROTOX

COMPANY LOCATION: **Arviat - Dump Leachate**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 30, 2001

Date/Time Received: September 04, 2001

Date/Time Test Start: September 04, 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: N/A (No pH adjustment)

Sample Appearance: Greenish, 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: September 04, 2001 / 12:11 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: 3.4 mg/L

IC_{50} Confidence Range: 1.8 to 6.8 mg/L

TEST ANALYST: Wade Romanko

INITIAL: WR