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NWB3GJO9904

October 5, 2001

Winnie Haitkaittuq
acting Senior Administrative Officer
Hamlet of Gjoa Haven
General Delivery
Gjoa Haven, NU X0B 1J0

August 13, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank Jacob Keanik 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 13, 2001 inspection; several concerns in regards to the state of the water use and waste disposal facilities were noted. Thus, the following considerations are underlined, and will need to be addressed:

- **Water supply:** No noticeable improvement could be observed in the condition of the water intake facilities (figure 1) since the previous inspection. Nevertheless, the attached analytical results relating to sample taken from Water Lake at Surveillance Network Program (SNP) station GJO-1 indicate that the municipal raw water supply meets the *Guidelines for Canadian Drinking Water Quality* for all tested parameters.

- **Sewage disposal:** Although fill material was added on last summer in order to raise the sewage lagoon retention berms, a significant notch nonetheless remains in the decanting area (figure 2). Since sewage effluent is discharged as soon as the contents of the lagoon reaches the lowest section of the berm, the extent of the erosion in the decant area restricts retention time and essentially nullifies the restoration work undertaken on the berms. As such, the attached analytical results relating to a sample collected ten metres from the lagoon decant (figure 3) reveal that levels of total suspended solids (270 mg/L vs 180 mg/L), biological oxygen demand (326 mg/L vs 120 mg/L), and field pH (10.4 vs 9.0) potentially breach Water licence NWB3GJO9904 effluent quality standards set at a station just prior to entering the ocean. In addition, the concentration of ammonia (2.66 mg/L vs 2.2 mg/L) slightly exceeds the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Moreover, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), denotes borderline toxicity as half of light-producing bacteria were inhibited by a sample concentration of 53.2%, whereas up to 50% is considered toxic.

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

MUNICIPAL WATER USE INSPECTION FORM

Date: 2001/08/13 **Licensee Rep.** (Name/Title): Jacob Keanik / Foreman

Licensee: Hamlet of Gjoa Haven **Licence No.:** NWB3GJO9904

WATER SUPPLY

Source(s): Water Lake / Swan Lake (recharge) **Quantity used:** recorded @ truck delivery

Owner:/Operator: Hamlet

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

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

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

Comments: No appreciable improvement noted in regards to the derelict status of the water intake and supply facilities; renewed conveyance line freeze up problems and bloodworm complications. Water Lake to be recharged from Swan Lake in late summer and/or early fall. Chlorination in use. Filtration system still bypassed.

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:** limited **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:** U **Erosion:** U

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

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

Construction: NA **O&M Plan:** U **A&R Plan:** none

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

Comments: Significant cleavage, and signs of erosion, of the sewage lagoon berm in the decanting area; slight flow from one of the two notches in the berm. Lack of freeboard in decanting area abridges retention time. Solid waste disposal facility is now fenced, although a gap in the section where the berm lowers creates a decant/runoff channel; no flow noted but an obviously stained path of leachate could be observed. Pooled water still lies in the middle of the wastepile. Household waste is regularly burnt and compacted towards the toe of the facility, but not covered; exposed waste covers an extensive area. Bulky metal wastes, hazardous materials and waste oil segregated; notable ground contamination in the waste oil storage area. Outstanding O&M plan.

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 @ Water Lake(GJO-1); sewage discharge @ 10 m below decant

Signs Posted **SNP:** no **Warning:** yes

Records & Reporting: No 1999, 2000 Annual Reports; no O&M plan

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: 1999 and 2000 Annual Reports not submitted; respectively due by 2000/03/31 and 2001/03/31. Operation and Management (O&M) plan for the municipal waste disposal facilities overdue since 1999/07/07.

Philippe Lavallée

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

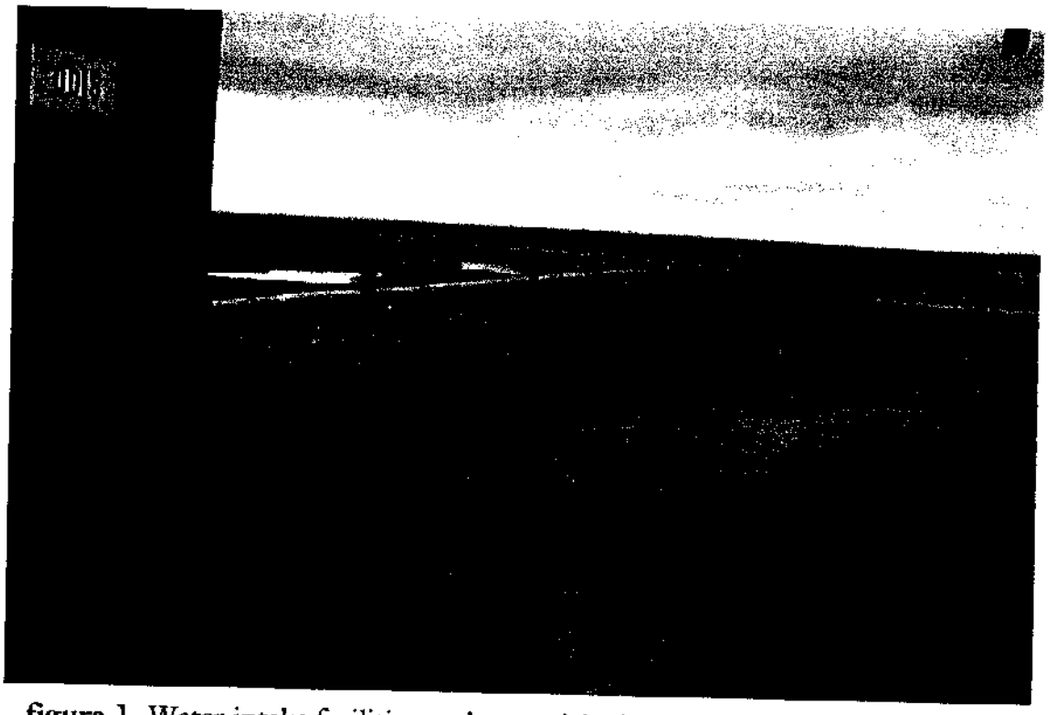

figure 1. Water intake facilities at the municipal water supply; 2001/08/13.

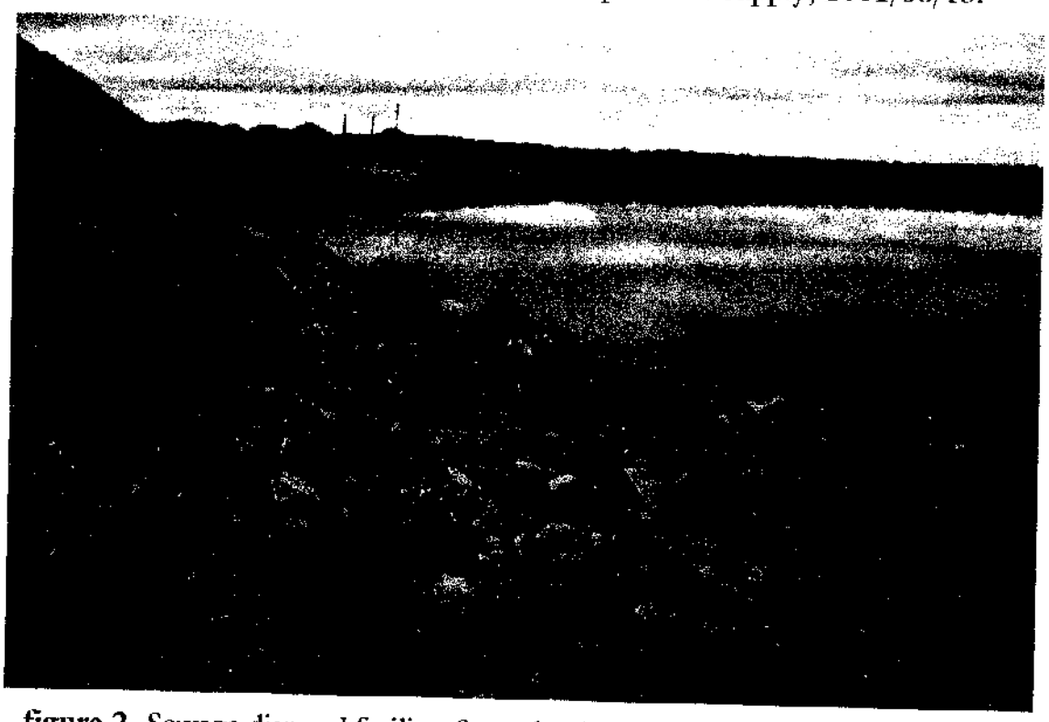

figure 2. Sewage disposal facility, from the decant area; 2001/08/13.

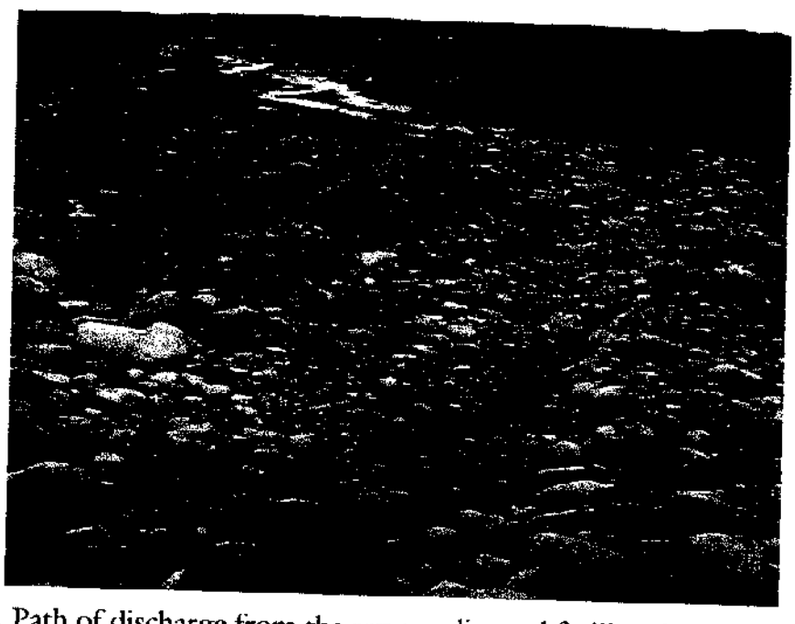

figure 3. Path of discharge from the sewage disposal facility; 2001/08/13.

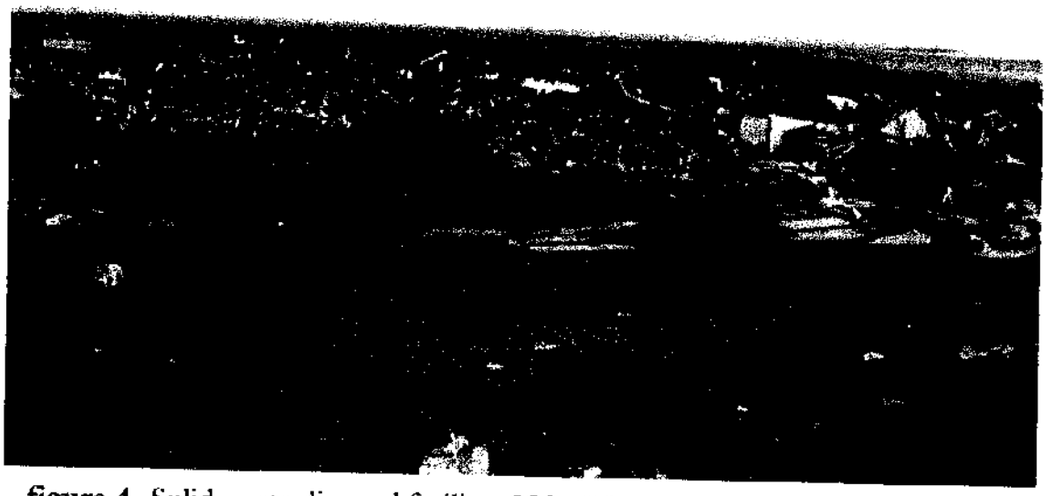

figure 4. Solid waste disposal facility; 2001/08/13.

figure 5. Pooled water along the toe of the solid waste disposal facility; 2001/08/13.

figure 6. Leachate from the toe of the solid waste disposal facility; 2001/08/13.

figure 7. Path of runoff from the solid waste disposal facility; 2001/08/13.

figure 8. Bulky metal wastes disposal site; 2001/08/13.

figure 9. Waste oil storage site, solid waste disposal facility; 2001/08/13.

- **Solid waste disposal:** The installation of a perimeter fence around the solid waste disposal facility has notably reduced the amount of garbage windblown beyond the facility. However, even if household waste is regularly burnt and pushed towards the toe of the dump, exposed waste covers an extensive area (figure 4). Accordingly, it was mentioned during the inspection that the wastepile should be covered with fill material, on at least an annual basis. Further, the pooled water which still lies in the middle of the wastepile (figure 5) poses definite leachate concerns. Indeed, although no flow was observed at the time of the inspection, an obvious path of runoff was noticeable immediately downslope of the solid waste disposal facility (figure 6), and beyond (figure 7). In parallel, bulky metal wastes and hazardous materials undergo segregation; while the metal waste site proved satisfactory (figure 8), noteworthy hydrocarbon staining was noted at the waste oil storage site (figure 9). Consequently, appropriate storage and disposal means for hazardous materials and waste oil were discussed during the inspection, as well as contaminated soil remediation measures.

- **Non-compliance of Act or Licence:** A handful of requirements of an administrative nature have been neglected since the issuance of Water licence NWB3GJO9904. Foremost of these is the submission an Annual Report (part B, item 1) for the years 1999 and 2000; respectively due by 2000/03/31 and 2001/03/31. As these reports constitute a critical source of information regarding municipal water uses and waste disposals available to the Nunavut Water Board (NWB) and regulatory agencies, the Inspector urges the Licensee to submit them promptly. Also, the Operation and Maintenance (O&M) plan for the municipal waste disposal facilities (part G, item 1), which was due by 1996/02/01, has not yet been provided to the NWB; since it was related during the previous inspection that it had already been contracted out, there should be no inconvenient to submit the plan in a timely manner. Lastly, an assessment of all existing and abandoned water use and waste disposal facilities located within municipal boundaries was due by 1999/12/01.

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)

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: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavallee

Sample ID: raw water GJO-1 **Taiga Sample ID:** 212061

Client Project: **Sample Type:** raw water **Received Date:** 14-Aug-01

Location: Ghoa Haven **Sampling Date:** 13-Aug-01

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

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Sodium	10.3	mg/L	0.02	15-Aug-01
Microbiology	Coliforms, Fecal	<1	CFU/100mL	1	14-Aug-01
Nutrients	Ammonia as N	0.013	mg/L	0.005	30-Aug-01
	Biological Oxygen Demand	<2	mg/L	2	14-Aug-01
	Nitrate+Nitrite as N	0.016	mg/L	0.008	21-Aug-01
Physicals	Colour	5		5	15-Aug-01
	Solids, Total Dissolved	139	mg/L	10	04-Sep-01
	Turbidity	1.0	NTU	0.1	15-Aug-01
Subcontract	Chloride	16.0	mg/L	0.1	30-Aug-01
	Sulphate	18.0	mg/L	0.3	30-Aug-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	<1	µg/L	1	21-Aug-01
	Copper	<2	µg/L	2	21-Aug-01
	Iron	<30	µg/L	30	20-Aug-01

Report Date: Monday, September 24, 2001

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- CERTIFICATE OF ANALYSIS -

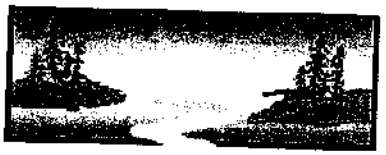
Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavallee

Sample ID: raw water GJO-1 **Taiga Sample ID:** 212061

Total Metals	Lead	<1	µg/L	1	21-Aug-01
	Manganese	10	µg/L	1	21-Aug-01
	Mercury	<0.01	µg/L	0.01	13-Sep-01
	Nickel	2	µg/L	1	21-Aug-01
	Zinc	15	µg/L	10	21-Aug-01

Field Data (01/08/13) GJO-1
Temperature: 14.5 °C
Conductivity: 245 µS/cm
pH: 8.4 **Time:** 13:26

Report Date: Monday, September 24, 2001



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- CERTIFICATE OF ANALYSIS -

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

Sample ID: Sewage Discharge GJO-3

Taiga Sample ID: 212062

Client Project:

Sample Type: sewage

Received Date: 14-Aug-01

Location: Ghoa Havan

Sampling Date: 13-Aug-01

Report Status: **Amended**

Approved by:

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Microbiology	Coliforms, Fecal	3000	CFU/100mL	1	14-Aug-01
Nutrients	Ammonia as N	2.66	mg/L	0.005	30-Aug-01
	Biological Oxygen Demand	326	mg/L	2	14-Aug-01
	Nitrate+Nitrite as N	0.017	mg/L	0.008	21-Aug-01
	Phosphorous, Total	12.2	mg/L	0.004	16-Aug-01
Physicals	Solids, Total Suspended	271	mg/L	3	04-Sep-01
Subcontract	Phenols	1.0	µg/L	0.5	22-Aug-01

Field Data (01/08/13) **GJO-3**
Temperature: 12.5 °C
Conductivity: 838 µS/cm
pH: 10.4 **Time:** 13:43

Report Date: Monday, September 17,

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: **GJO-3 Lagoon Discharge, 212062**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 13, 2001 13:43

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: **TOXIC - IC_{50} Concentration: 53.2%** **(Toxic 0 to 50%)**

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 / 02:10 PM

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

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

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

Reagent Lot #: ACV026-6

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

TEST ANALYST: Ron Bujold **INITIAL:** RB