



Appendix 3

DIAND Inspection Reports



DIAND Nunavut District
Box 100
Iqaluit, NT
XOA OHO

February 10, 1998

B9545-5-N4L4-1571

Mr. Dan Leaman
Senior Administrative Officer
Hamlet of Resolute Bay
Resolute Bay, NT
XOA OVO

Dear Mr. Leaman,

135 Acres Inspection
- 1 Date

Re: Analytical Results from July 8, 1997 Inspection

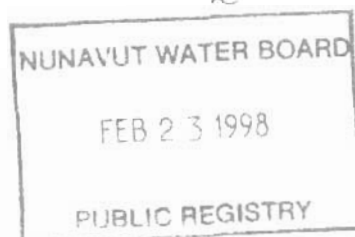
1. Attached are the analytical results for the water samples collected during the last inspection. These samples were collected from Char Lake, sewage effluent and below the dump (leachate).
2. The results indicate that the quality of the drinking water meets the Canadian Health and Welfare Drinking Water Guidelines for those parameters tested. There are no concerns with the quality of the drinking water.
3. With the exception of fecal coliform, the sewage effluent quality is really quite good. This is due solely to the amount of dilution that household waste is subjected to prior to being discharged.

Please do not hesitate to contact this office if you have any questions regarding these results.

Sincerely,

Paul Smith
Water Resources Officer
Nunavut District

- cc.
- Nunavut Water Board, Gjoa Haven
 - DIAND Water Resources, YK
 - MACA, Iqaluit (Tanya Smith)
 - Public Health, Iqaluit (Nicole Ritchie)



TAIGA ENVIRONMENTAL LABORATORY
 Dept. Indian Affairs & Northern Development
 4601-52 nd Ave., Box 1500
 Yellowknife, NT. X1A 2R3
 Tel. (403) 669-2788
 Fax: (403) 669-2718

To: NUNAVUT
 WATER RESOURCES, NAP, DIAND
 BOX 100
 IQALUIT NT X0A 0H0
 PAUL SMITH

SAMPLE INFORMATION

Our Lab#: 971070
 Your Sample ID: 1571-1
 Sample Matrix: water
 Collection:
 Location: Hamlet of Resolu
 Date: 08/07/97
 By: PSmith

Account No:

Received Date: July/09/97

Report Date: 30-Jul-97

Approved By:

SAMPLE ANALYSIS REPORT -

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
71070	pH	8.78	pH	0.05	09/07/97	010301
	Conductivity	13.1	uS/cm	0.3	09/07/97	02041
	Colour	1.5		5.00	18/07/97	02021
	Alkalinity	59.6	mg/L	0.3	09/07/97	010101
	Turbidity	3.1	NTU	0.1	14/07/97	002081
	Tot-Suspended-Solids	3	mg/L	3	11/07/97	grav
	NO3-N+NO2-N	0.010	mg/L	0.008	09/07/97	07110
	Calcium	18.1	mg/L	0.03	16/07/97	20103
	Potassium	0.539	mg/L	0.002	11/07/97	019306
	Magnesium	2.41	mg/L	.005	16/07/97	012102
	Sodium	7.6	mg/L	0.02	11/07/97	011102
	Tot-Mercury(water)	0.07	ug/L	0.01	10/07/97	080314
	Tot-Arsenic(water)	1	ug/L	0.2	15/07/97	hydride
	Tot-Cadmium(ICP-MS)	1	ug/L	1	15/07/97	ICP-MS
	Tot-Cobalt(ICP-MS)	1	ug/L	1	15/07/97	ICP-MS
	Tot-Chromium(ICP-MS)	1	ug/L	1	15/07/97	ICP-MS
	Tot-Copper(ICP/MS)	1	ug/L	1	15/07/97	ICP-MS
	Tot-Iron(AA)	7.87	mg/L	0.1	17/07/97	ICP-MS
	Tot-Manganese(ICP-MS)	1	ug/L	0	15/07/97	ICP-MS

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PAUL SMITH

97070

Tot-Nickel(ICP-MS)	0.04	ug/l.	0.0	15/07/97	ICP-MS
Tot-Lead(ICP-MS)	0.0	ug/l.	0.0	15/07/97	ICP-MS
Tot-Zinc(ICP-MS)	0.0	ug/l.	0.0	17/07/97	ICP-MS

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To: NUNAVUT
WATER RESOURCES, NAP, DIAND
BOX 100
IQUALUIT NT X0A 0H0
PAUL SMITH

SAMPLE INFORMATION

Our Lab#: 971071
Your Sample ID: 1571-3
Sample Matrix: ~~water~~ Sewage

Account No:

Collection:

Location: Hamlet of Resolu
Date: 7/8/97
By: PSmith

Received Date: 10-July-1997

Report Date: 23-Jul-97

Approved By: [Signature]

SAMPLE ANALYSIS REPORT -

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
	pH	8.00	pH	0.05	7/9/97	010301
	Conductivity	201	uS/cm	0.1	7/9/97	02041
	Tot-Suspended-Solids	15	mg/L	3	7/11/97	grav
	Ammonia-N	0.561	mg/L	0.005	7/15/97	007562
	Tot-Coliforms	2600000	CFU/dl	1	7/10/97	036002
	Bio-Oxy-Demand	15	mg/L	2	7/9/97	08208

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To: NUNAVUT
WATER RESOURCES, NAP, DIAND
BOX 100
IQALUIT, NT X0A 0H0
PAUL SMITH

SAMPLE INFORMATION

Our Lab#: 971072
Your Sample ID: 1571-5
Sample Matrix: water dump leachate

Account No:

Collection:

Location: Hamlet of Resolu
Date: 08/07/97
By: PSmith

Received Date: July/09/97

Report Date: 29-Jul-97

Approved By: 1 E.

- SAMPLE ANALYSIS REPORT -

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
971072	Tot-Cadmium(ICP-MS)	0.1	ug/L	0	15/07/97	ICP-MS
	Tot-Cobalt(ICP-MS)	1.7	ug/L	0	15/07/97	ICP-MS
	Tot-Chromium(ICP-MS)	1.4	ug/L	0	15/07/97	ICP-MS
	Tot-Copper(ICP/MS)	85.2	ug/L	0	15/07/97	ICP-MS
	Tot-Iron(AA)	0.064	mg/L	0.012	17/07/97	ICP-MS
	Tot-Manganese(ICP-MS)	20.0	ug/L	0	15/07/97	ICP-MS
	Tot-Nickel(ICP-MS)	4.4	ug/L	0	15/07/97	ICP-MS
	Tot-Lead(ICP-MS)	3.2	ug/L	0	15/07/97	ICP-MS
	Tot-Zinc(ICP-MS)	45.0	ug/L	0	17/07/97	ICP-MS

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

REF. #010937 Inspection - I TAE
tel: (867) 975-4275
fax: (867) 979-6445

ccy

N4L3-1571 (expired)

September 27, 2001.

Ralph Alexander
Senior Administrative Officer
Hamlet of Resolute Bay
General Delivery
Resolute, NU X0A 0V0

DEC 05 00 15/01

July 23, 2001 Municipal Water Use Inspection - Report

Firstly, I wish to thank Joadamee Amagoalik and Keith Adams for their 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 July 23, 2001 inspection; no major concerns were identified at the municipal facilities. However, the following considerations were nonetheless noted:

- **Water supply:** No concerns were noted at the well-kept Char Lake water intake facility, where pending upgrades should eliminate the need to maintain constant bleeds in order to prevent conveyance line freeze-ups. Further, the attached analytical results relating to a sample collected from Surveillance Network Station (SNP) station 1571-1 indicate that the raw water meets the *Guidelines for Canadian Drinking Water Quality* for all tested parameters.
- **Sewage disposal:** Even if somewhat crude, it appears that the filtering provided by the tumbling screens at the sewage treatment plant significantly contributes to the treatment of sewage effluent prior to its discharge to receiving waters. Indeed, the attached analytical results relating to a sample collected from SNP station 1571-3 (figure 1) meet all tested parameters of the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*, and of the now expired Water licence N4L3-1571. Moreover, the Microtox sample, which constitutes a reliable toxicity indicator (IC₅₀), did not attribute toxicity to the discharged sewage effluent.
- **Solid waste disposal:** Although household waste appears well burnt/compacted and is annually covered, a significant amount of exposed waste nevertheless lines the toe of the unfenced solid waste disposal facility (figure 2). However, in light of the absence of observable leachate flowing from the site, the impact of the facility on receiving waters appears relatively minimal.

Canada

In related matters, concerns were voiced during the inspection in regards to the work undertaken at the location of a proposed replacement solid waste disposal facility (figure 3). Accordingly, the Inspector wishes to remind Community Government and Transportation (CG&T) that relevant information ought to be provided to the Nunavut Water Board (NWB) prior to the commissioning of a facility which may potentially bring about the deposit of waste into waters. Also, as Licensee of Water licence N4L3-1571, the Hamlet is bound to submit to the NWB an Abandonment and Restoration (A&R) plan at least six (6) months before abandoning a waste disposal facility.

- **Non-compliance of Act or Licence:** Although reminders and assistance have been provided, the Hamlet has yet to produce an Operation and Management (O&M) plan for its municipal waste disposal facilities, as well as 1998 and 1999 Annual Reports. In addition, by allowing its Water licence to lapse into expiry since 1999/06/30, the Hamlet's municipal water use and waste disposal are currently unlicensed, contrary to requirements of both the *Northwest Territories Waters Act* and the *Nunavut Land Claims Agreement*. While the Inspector acknowledges that the Hamlet's somewhat restricted resources might already be overburdened, the above licencing issues must be addressed in a timely manner, and not only once all other municipal considerations will have been seen to.

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

Sincerely,



Philippe Lavallée
Water Resources Officer
INAC, Nunavut District

- Nunavut Water Board, Gjoa Haven
- DPW&H, Resolute (Neil MacDonald)
- 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: 2001/07/23 Licensee Rep. (Name/Title): Joadamee Amagoalik / Building Maintainer
Keith Adams / DPW&H

Licensee: Hamlet of Resolute Bay

Licence No.: N4L3-1571 (expired)

WATER SUPPLY

Source(s): Char Lake

Quantity used: intake meter at 23 010 269

Owner/Operator: GN

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

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

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

Comments: Water intake facility well-kept. Water use reportedly constant at approximately 33 000 gallons per day, roughly translating to 55 000 m³ annually. Expecting a timed-valve system on the summer's sealift; will improve line freeze-up prevention while decreasing water consumption. Minimal chlorination in use.

WASTE DISPOSAL

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

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

Seasonal Discharge: Wetlands Treatment: 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: U A&R Plan: U

Periods of Discharge: A Effluent Discharge Rate: not measured

Comments: All but a couple of housing units are connected to the utilidor system. Sewage effluent is filtered prior to discharge. Little apparent segregation of waste occurs at the unfenced solid waste disposal facility. Although the burnt compacted wastepile is covered annually, a notable amount of waste is nonetheless exposed along the toe of the dump. Third party handles, and disposes of, hazardous materials and waste oils. Trickling flow heard from the toe of the dump, but no surface runoff could be observed. Operation and Maintenance (O&M) plan for municipal waste disposal facilities not submitted. Abandonment and Restoration (A&R) plan for the solid waste disposal facility not provided although work on a replacement site has been undertaken.

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 (1571-1), sewage discharge

Signs Posted SNP: none Warning: none

Records & Reporting: no licence renewal application, 1998 / 1999 Annual Reports, O&M A&R plans

Geotechnical Inspection: not applicable

Non-Compliance of Act or Licence: Water licence N4L3-1571 allowed to lapse into expiry since 1999/06/30, 1998 and 1999 Annual Reports as well O&M plan not submitted; respectively due by 1999/03/31, 2000/03/31, and 1999/12/30. No A&R yet provided for the solid waste disposal facility.

Philippe Lavallee

Inspector's Name

Inspector's Signature



figure 1. Sewage discharge into Resolute Bay, SNP station 1571-3; 2001/07/23.



figure 2. Toe of the current solid waste disposal facility; 2001/07/23.



figure 3. Fence erected at the proposed location of the new dump; 2001/07/23



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COLT

SEP 05 2001

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations

Attn: Philippe Lavallee

Sample ID: Raw Water 1571

Taiga Sample ID: 211691

Client Project:

Sample Type: sewage

Received Date: 26-Jul-01

Location: Resolute Bay

Sampling Date: 23-Jul-01

Report Status: Final

Approved by:

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Major Ions	Chloride	9.6	mg/L	0.2	01-Aug-01
	Sodium	7.13	mg/L	0.02	26-Jul-01
	Sulphate	<3	mg/L	3	08-Aug-01
Nutrients	Ammonia as N	<0.005	mg/L	0.005	10-Aug-01
	Nitrate+Nitrite as N	<0.008	mg/L	0.008	09-Aug-01
Physicals	Colour	<5			27-Jul-01
	Solids, Total Dissolved	113	mg/L	10	21-Aug-01
Total Metals	Arsenic	<1.0	µg/L	1.0	31-Jul-01
	Cadmium	<0.1	µg/L	0.1	01-Aug-01
	Chromium	<0.1	µg/L	0.1	01-Aug-01
	Cobalt	<0.1	µg/L	0.1	01-Aug-01
	Copper	<0.1	µg/L	0.1	01-Aug-01
	Zinc	<0.1	µg/L	0.1	27-Jul-01

Report Date: August 22, 2001

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Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations

Attn: Philippe Lavallee

Sample ID: Raw Water 1571-1

Taiga Sample ID: 211691

Total Metals	1	µg/L	1	01-Aug-01
Manganese	1	µg/L	1	01-Aug-01
Mercury	<0.01	µg/L	0.01	03-Aug-01
Nickel	1	µg/L	1	01-Aug-01
Cadmium	10	µg/L	10	01-Aug-01

Field Data (01/07/23) 1571-1

Temperature: 8.5 °C

Conductivity: 162 µS/cm

pH: 8.0

Time: 11:35

Report Date: August 22, 2001

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Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT, X1A 2K3

Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND District Office : Nunavut DIAND Operations

Attn: Philippe Lavallee

Sample ID: Sewage Discharge 1571

Taiga Sample ID: 211692

Client Project:

Sample Type: water

Received Date: 26-Jul-01

Location: Resolute Bay

Sampling Date: 23-Jul-01

Report Status: Final

Approved by:

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Nutrients	Ammonia as N	1.87	mg/L	0.005	21-Aug-01	
	Nitrate+Nitrite as N	1.44	mg/L	0.008	09-Aug-01	
	Phosphorous, Total	0.388	mg/L	0.004	10-Aug-01	
Organic	Phenols		µg/L	0.5	22-Aug-01	10
Physicals	Solids, Total Suspended	15	mg/L	3	13-Aug-01	

Data Qualifier Descriptions:

10 Analyst error, unable to repeat measurement

Field Data (01/07/23) 1571-3
Temperature: 7.0 °C
Conductivity: 341 µS/cm
pH: 8.4 Time: 10:50

Report Date: August 22, 2001

Page 1 of 1

REPORT OF TOXICITY USING MICROTOX

COMPANY/LOCATION: Resolute Bay Sewage Discharge - 1571 - 3

Sample Collected By: Philippe Lavallee

Date/Time Sampled: July 23, 2001

Date/Time Received: July 26, 2001

Date/Time Test Start: July 26, 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 fischeri* (*Photobacterium phosphoreum*)

Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: 7.8

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 26, 2001 / 12:09 PM

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

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Analyst: Wade Romanko - EPB

Date of Test: July 26, 2001

Reagent Lot #: ACV023-3

IC₅₀ - 15 minutes mg/L: 3.8 mg/L

IC₅₀ Confidence Range: 2.7 to 5.4 mg/L

TEST ANALYST: Wade Romanko

INITIAL: WR