Indian and Northern Affairs Canada
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Your file - Votre reference

Our file - Notre référence
Unlicenced

October 14, 2003

Mr Rick Van Horn
Senior Administrative Officer
Hamlet of Arviat
P.O. Box 150
Arviat, NU
X0C 0E0

Re: Water Licence Inspection August 12, 2003

The following letter deals with the water licence inspection conducted on August 7, 2003. As the Hamlet of Arviat is still in the process of obtaining a water licence the inspection was conducted with reference to the general conditions specified in other water licences issued by the Nunavut Water Board (NWB). I would like to thank Senior Administrative Officer (SAO) Rick Van Horn and Hamlet Foreman John Owlojoot for their time and assistance in providing information and transportation necessary to complete my inspection.

Potable Water-Wolf Creek Reservoir

The reservoir is well maintained (figure 1) with a fence around it and a sign advising people to keep out. There should also be signage identifying the reservoir as the drinking water source for the Hamlet of Arviat. The pumphouse was well maintained with daily records of water volumes pumped to delivery trucks. Chlorine levels are measured and recorded daily and the chlorination system appeared to be in good condition. As of yet monthly/annual water use has not been calculated and I suggested to Mr Owlojoot that this should be done. A more pressing concern is the fact that when Mr Owlojoot is sick no one records the chlorine concentration for the water going out to the community. Someone should be trained and available in the eventuality that Mr Owlojoot is unable to perform his duties.

Water samples were taken from the reservoir and they were designated as ARV-1 to follow the convention used in other NWB water licences. Analysis for Turbidity (1.2 NTU>1.0 NTU) was slightly higher than the Maximum Allowable Concentration (MAC) for water entering a distribution system (GCDWQ 2003). High turbidity is a concern because it reduces the effectiveness of chlorination in eliminating microbes harmful to human health. The fact that the reservoir was

Canada

filled only shortly before the sample was taken could have contributed to the increased turbidity. In future, care should be taken to avoid filling the reservoir when Wolf Creek is obviously turbid. All other results for water samples taken from Wolf Creek reservoir proved to be within Guidelines for Canadian Drinking Water Quality (GCDWQ) 2003.

Solid Waste Landfill

The landfill is a burn and bury facility that conducts burns when weather permits. A fence around the perimeter of the landfill helps to contain solid waste in the landfill but there are currently no signs identifying the solid waste disposal facility.

Materials in the landfill are not well segregated as metal waste and 12-volt lead acid batteries are visible in the landfill. There is also a considerable amount of ponding (figure 2) on the perimeter of the landfill with a ditch for leachate to flow out of the landfill (figure 3) into a pond on the Northwest side of the landfill. I advised the SAO that this should be remedied. All precipitation and runoff entering the landfill should be contained and sampled before it can be pumped out of the landfill. This will help prevent the release of contaminants. Samples of the pond water receiving runoff from the Arviat landfill were all within the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories as well as the Canadian Water Quality Guidelines for the Protection of Aquatic Life 2002 (see attached lab results). Mr Van Horn suggested pumping the water into the sewage lagoon on the Southeast side of the landfill. It would be better to simply contain the accumulated water until it can be determined how contaminated it is. If the water is within the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories as well as the Canadian Water Quality Guidelines for the Protection of Aquatic Life 2002 it can be discharged. Combining seepage from the solid waste disposal site with sewage effluent could have unpredictable effects on the toxicity of the final effluent.

Waste Metal Containment

Some segregation of materials was evident at the metal dump, however there was no containment of hazardous materials. A number of Pyrene fire extinguishers (figure 4) were observed scattered around the site. Mr Van Horn has said that he will have the fire extinguishers collected and stored in a Sea Lift container until they can be disposed of properly.

Waste Oil Storage

The waste oil for the hamlet is designated to be burned in a waste oil burner which is the property of the Hamlet. The burner has not been used for some time and there is an accumulation of more than 50 drums of waste oil at the site. Mr Van Horn said that there was not currently anything wrong with the burner and it is unclear why the accumulation had occurred. The drums were generally in a dilapidated state with significant rust visible and a large amount of hydrocarbon

contamination visible at the site (figure 5). No structures are in place to contain spills of waste oil. The spills should be cleaned up and the waste oil should be burned on a more regular basis to prevent accumulation that leads to spillage. Construction of a lined and bermed area would prevent further soil contamination from waste oil spills.

Sewage Lagoon

The lagoon had less than a meter of freeboard but the containment berms were all intact (figure 6). The lagoon is very well situated with greater than 100m of heavy plant growth between the discharge site and Hudson Bay (figure 7). As a result, the effluent should be well treated by the time it reaches the bay. The lagoon is decanted when necessary using pumps. Samples (ARV-3) of the lagoon effluent were taken at the decant site. Sample analysis performed by Taiga laboratory in Yellowknife showed the samples to have Total Suspended Solids of 248 mg/l which exceed the standard of 180mg/L imposed on licenced communities by the Nunavut Water Board. Iron, at a concentration of 4888ug/L greatly exceeded the guideline for the Protection of Freshwater Aquatic Life (300ug/L) but no guideline is currently available for marine life.

The issue of capacity is to be addressed through the creation of an additional lagoon adjacent to the current lagoon. Rick suggested that both lagoons would continue to be utilized although in alternating years. The second lagoon would not have the benefit of the filtering action of the heavy plant growth between it and the Bay and I suggested that they should consider pumping the effluent to the discharge site of the first lagoon. He was receptive to this suggestion. The new cell is scheduled to be constructed beginning late summer or early fall 2003.

Non-compliance of the Act:

The Hamlet of Arviat does not yet have a water licence but Rick Van Horn has assured me that the Hamlet will complete the necessary tasks to obtain a licence from the Nunavut Water Board. I expect that the Hamlet of Arviat will successfully obtain a water licence and I look forward to assisting the Hamlet in meeting it's requirements.

If you have any questions or concerns, please feel free to contact me.

Sincerely,

Scott Stewart

Scott Stewart
Water Resource Officer
INAC - Nunavut District Office
P.O. Box 100, Iqaluit, NU, X0A 0H0
Ph:(867) 975-4289 Fax:(867) 975-6445

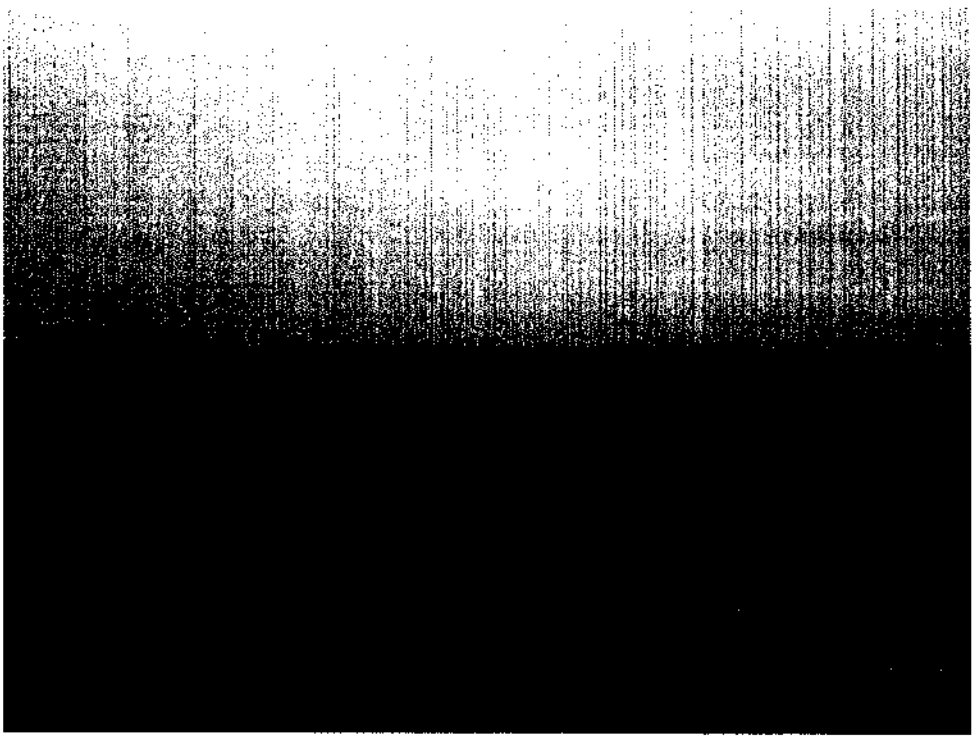

Figure 1. One of the two cells of Wolf Creek Reservoir with the pumphouse in the background

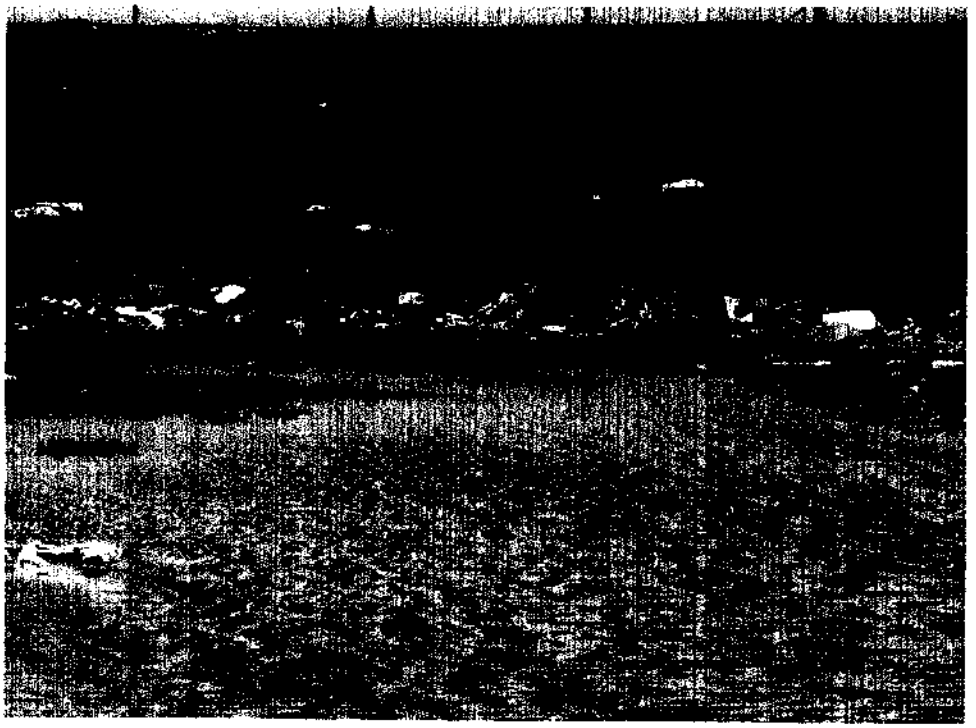

Figure 2. Significant ponding around the perimeter of the Hamlet of Arviat landfill.

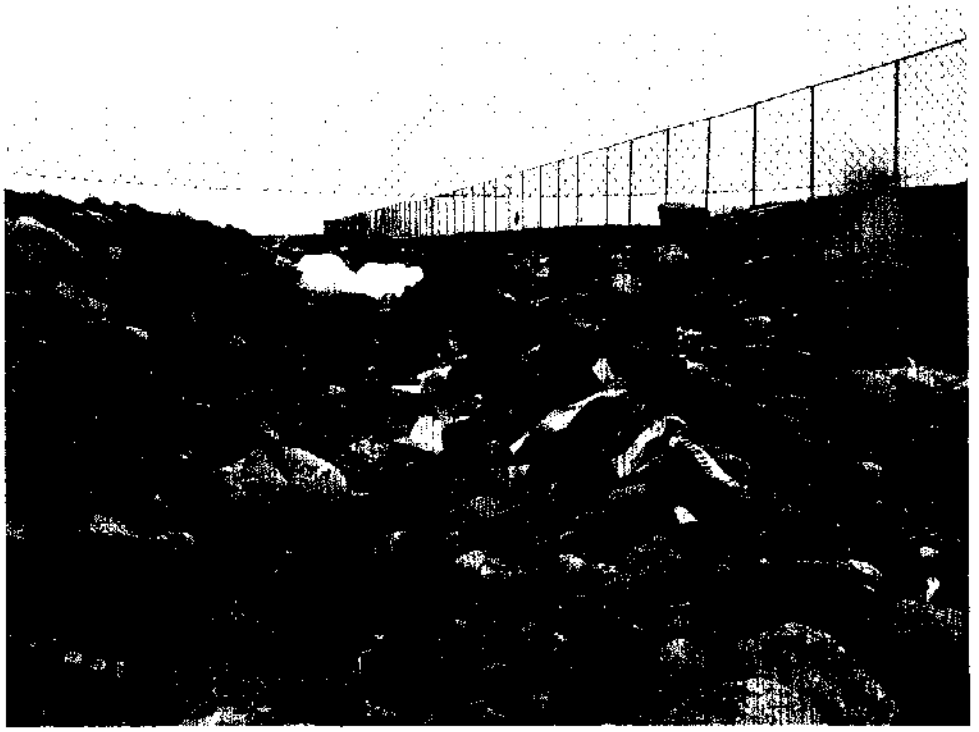

Figure 3. Drainage ditch on the Northwest corner of the Hamlet of Arviat landfill.

Figure 4. Improperly disposed fire extinguishers in Arviat metal dump.

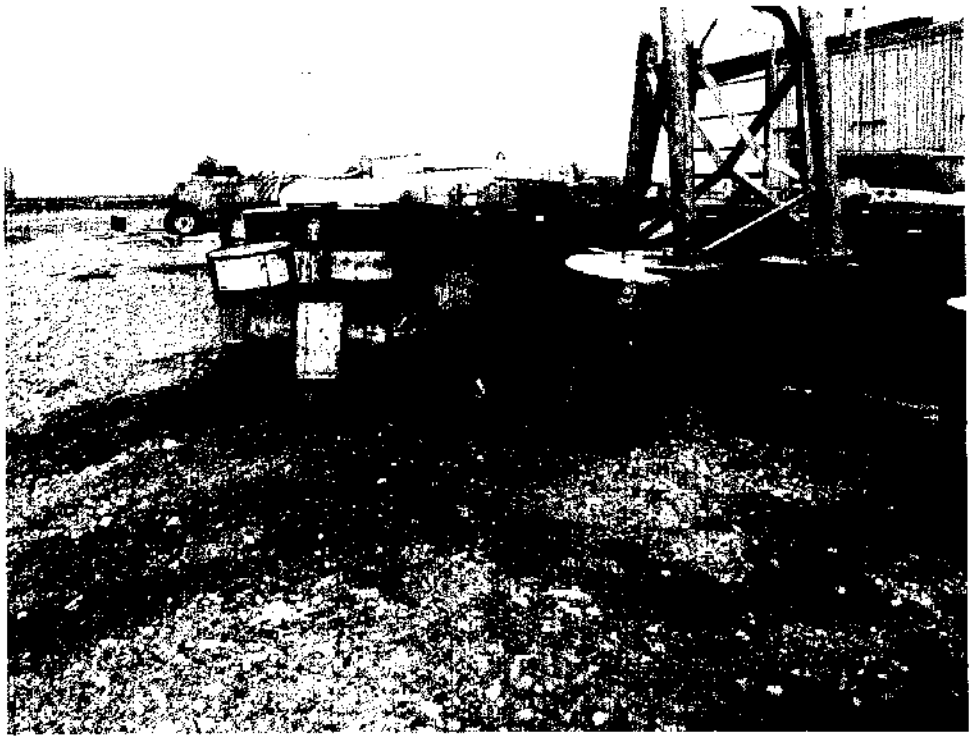

Figure 5. Hamlet of Arviat waste oil storage with hydrocarbon contamination visible.

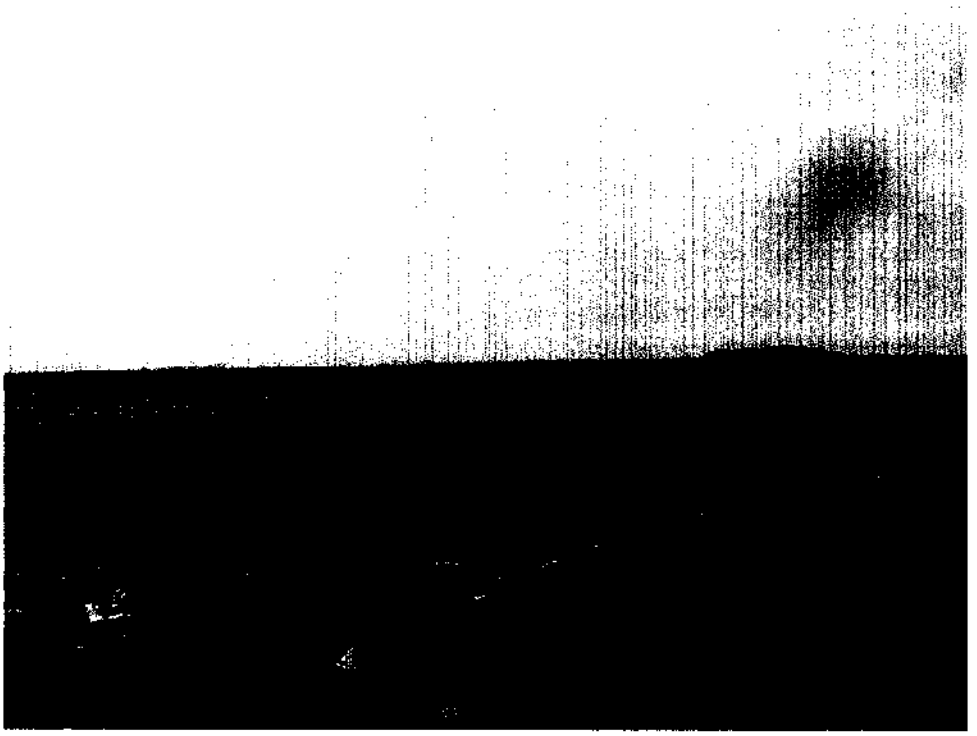

Figure 6. Hamlet of Arviat sewage lagoon.

Figure 7. Hamlet of Arviat sewage lagoon outfall with wetland and Hudson Bay visible in background.

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MUNICIPAL WATER USE INSPECTION REPORT

Date: August 7, 2003 **Licensee Rep. (Name/Title):** Rick Van Horn/ SAO

Licensee: Hamlet of Arviat **Licence No.:** File # : **N6L4-1562** (Unlicenced)

WATER SUPPLY

Source(s): Wolf Creek/Reservoir **Quantity used:** Not Calculated

Owner:/Operator: Hamlet of Arviat

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 **Conveyance Lines:** A **Pumping Stations:** A

Comments: One of the cells at Wolf Creek Reservoir has been drained but the other is full. Pumping, which occurs annually for approximately a week, was begun a few days prior to the inspection (exact date not known). Grab samples were taken from the full reservoir and the pumphouse operator informed me that water samples are taken monthly from the pumphouse before discharge to the water trucks. The samples are apparently analyzed by the Public Health Office in Rankin Inlet.

WASTE DISPOSAL

Sewage: **Sewage Treatment System** (Prim./Sec/Ter.): Primary; with discharge over land to ocean

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

Seasonal Discharge: X **Wetlands Treatment:** >100m **Trench:**

Solid Waste: **Owner/Operator:** Hamlet of Arviat

Landfill: **Burn & Landfill:** X **Other:**

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

Discharge Quality: Sampled **Decant Structure:** A **Erosion:** A

Discharge Meas. Device: NIL **Dyke Inspection:** A **Seepages:** A

Dams, Dykes: A **Freeboard:** U **Spills:** NIL

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

Periods of Discharge: A **Effluent Discharge Rate:** Not Measured

Comments: The sewage lagoon has less than a meter of freeboard but all berms are intact. A second lagoon is scheduled to be constructed this fall to help address the lack of freeboard in the lagoon.
The landfill is well fenced in but no signage is present. A burn was recently performed but the refuse has not yet been compressed or buried. There is a significant amount of ponding around the perimeter of the landfill which flows into a pond adjacent to the landfill via a drainage ditch. A grab sample of the pond at the drainage outflow was taken. There was no water running in the ditch at the time of the sample.

FUEL STORAGE

Owner/Operator:

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

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

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

Pipeline Condition: A **Not Applicable:** **Condition of Tanks:** NI

SURVEILLANCE NETWORK PROGRAM (SNP)

Samples Collected **Hamlet:** Not Applicable

INAC: potable water, sewage effluent, dump seepage

Signs Posted **SNP:** NIL **Warning:** No people sign at reservoir

Records & Reporting: Not Applicable

Geotechnical Inspection: None Required

Non-Compliance of Act or Licence: At the time of inspection the Hamlet of Arviat did not hold a Water Licence as required under both *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* for the use of water and disposal of waste. The SAO, Rick Van Horn, has been put in touch with Jim Wall in Cambridge Bay to determine the status of the Hamlet's water licence application.

Scott Stewart

Inspector's Name

Scott Stewart

Inspector's Signature

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: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: potable ARV-1 **Taiga Sample ID:** 232645

Client Project: **Sample Type:** potable water **Received Date:** 12-Aug-03

Location: Hamlet of Arviat **Sampling Date:** 07-Aug-03

Report Status: Preliminary ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Physicals					
Colour	<5		5	27-Aug-03	
Conductivity, Specific	58.8	µS/cm	0.3	17-Aug-03	
pH	6.96	pH units	0.05	17-Aug-03	
Solids, Total Dissolved	36	mg/L	10	20-Aug-03	
Solids, Total Suspended	<3	mg/L	3	20-Aug-03	
Turbidity	1.2	NTU	0.1	20-Aug-03	
Nutrients					
Ammonia as N	<0.005	mg/L	0.005	25-Aug-03	
Nitrate+Nitrite as N	<0.008	mg/L	0.008	21-Aug-03	
Phosphorous, Total	0.011	mg/L	0.002	22-Aug-03	
Major Ions					
Calcium	3.24	mg/L	0.05	19-Aug-03	
Chloride	8.5	mg/L	0.2	19-Aug-03	
Magnesium	1.17	mg/L	0.02	19-Aug-03	
Potassium	0.62	mg/L	0.03	20-Aug-03	
Sodium	3.88	mg/L	0.02	20-Aug-03	
Sulphate	<3	mg/L	3	20-Aug-03	

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office **Attn:** Constantine Bodykevi

Sample ID: potable ARV-1 **Taiga Sample ID: 232645**

Metals, Total

Aluminum		µg/L		
Antimony		µg/L		
Arsenic	<1	µg/L	1	18-Aug-03
Barium		µg/L		
Beryllium		µg/L		
Cadmium		µg/L		
Cesium		µg/L		
Chromium		µg/L		
Cobalt		µg/L		
Copper		µg/L		
Iron	86	µg/L	30	18-Aug-03
Lead		µg/L		
Lithium		µg/L		
Manganese		µg/L		
Mercury	<0.01	µg/L	0.01	25-Aug-03
Molybdenum		µg/L		
Nickel		µg/L		
Rubidium		µg/L		
Selenium		µg/L		
Silver		µg/L		
Strontium		µg/L		
Thallium		µg/L		
Titanium		µg/L		
Uranium		µg/L		

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: potable ARV-1 **Taiga Sample ID: 232645**

Vanadium	µg/L
Zinc	µg/L

Data Qualifier Descriptions:

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevt

Sample ID: seep ARV-2 **Taiga Sample ID:** 232649

Client Project: **Sample Type:** sewage **Received Date:** 12-Aug-03

Location: Hamlet of Arviat **Sampling Date:** 07-Aug-03

Report Status: **Preliminary** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Physicals					
Colour	120		5	27-Aug-03	
Conductivity, Specific	3810	µS/cm	0.3	19-Aug-03	
pH	7.79	pH units	0.05	19-Aug-03	
Solids, Total Suspended	32	mg/L	3	20-Aug-03	
Turbidity	21.2	NTU	0.1	20-Aug-03	
Nutrients					
Ammonia as N	35.8	mg/L	0.005	25-Aug-03	
Nitrate+Nitrite as N	0.104	mg/L	0.008	21-Aug-03	
Phosphorous, Total	4.03	mg/L	0.002	22-Aug-03	
Major Ions					
Calcium	195	mg/L	0.05	19-Aug-03	
Chloride	841	mg/L	0.2	19-Aug-03	
Magnesium	68.0	mg/L	0.02	19-Aug-03	
Potassium	54.5	mg/L	0.03	20-Aug-03	
Sodium	459	mg/L	0.02	20-Aug-03	
Sulphate	298	mg/L	3	20-Aug-03	
Metals, Total					

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: seep ARV-2 **Taiga Sample ID:** 232649

Aluminum		µg/L		
Antimony		µg/L		
Arsenic	7	µg/L	1	18-Aug-03
Barium		µg/L		
Beryllium		µg/L		
Cadmium		µg/L		
Cesium		µg/L		
Chromium		µg/L		
Cobalt		µg/L		
Copper		µg/L		
Iron	812	µg/L	30	25-Aug-03
Lead		µg/L		
Lithium		µg/L		
Manganese		µg/L		
Mercury	< 0.01	µg/L	0.01	25-Aug-03
Molybdenum		µg/L		
Nickel		µg/L		
Rubidium		µg/L		
Selenium		µg/L		
Silver		µg/L		
Strontium		µg/L		
Thallium		µg/L		
Titanium		µg/L		
Uranium		µg/L		
Vanadium		µg/L		

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: seep ARV-2 **Taiga Sample ID: 232649**

Zinc	µg/L

Data Qualifier Descriptions:

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: sewage ARV-3 **Taiga Sample ID:** 232650

Client Project: **Sample Type:** sewage **Received Date:** 12-Aug-03

Location: Hamlet of Arviat **Sampling Date:** 07-Aug-03

Report Status: **Preliminary** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
Physicals					
Colour	200		5	27-Aug-03	
Conductivity, Specific	4650	µS/cm	0.3	19-Aug-03	
pH	7.16	pH units	0.05	19-Aug-03	
Solids, Total Dissolved	1330	mg/L	10	20-Aug-03	
Solids, Total Suspended	248	mg/L	3	20-Aug-03	
Turbidity	44.4	NTU	0.1	20-Aug-03	
Nutrients					
Ammonia as N	84.3	mg/L	0.005	25-Aug-03	
Chemical Oxygen Demand	300	mg/L	1	26-Aug-03	
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	21-Aug-03	
Phosphorous, Total	21.9	mg/L	0.002	22-Aug-03	
Major Ions					
Calcium	24.1	mg/L	0.05	19-Aug-03	
Chloride	1070	mg/L	0.2	19-Aug-03	
Magnesium	6.11	mg/L	0.02	19-Aug-03	
Potassium	48.5	mg/L	0.03	20-Aug-03	
Sodium	604	mg/L	0.02	20-Aug-03	
Sulphate	117	mg/L	3	20-Aug-03	

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: sewage ARV-3 **Taiga Sample ID:** 232650

Metals, Total

Aluminum		µg/L		
Antimony		µg/L		
Arsenic	9	µg/L	1	18-Aug-03
Barium		µg/L		
Beryllium		µg/L		
Cadmium		µg/L		
Cesium		µg/L		
Chromium		µg/L		
Cobalt		µg/L		
Copper		µg/L		
Iron	4888	µg/L	30	25-Aug-03
Lead		µg/L		
Lithium		µg/L		
Manganese		µg/L		
Mercury	< 0.01	µg/L	0.01	25-Aug-03
Molybdenum		µg/L		
Nickel		µg/L		
Rubidium		µg/L		
Selenium		µg/L		
Silver		µg/L		
Strontium		µg/L		
Thallium		µg/L		
Titanium		µg/L		
Uranium		µg/L		

Report Date: Wednesday, September 17, 2003

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office *Attn:* Constantine Bodykevi

Sample ID: sewage ARV-3 **Taiga Sample ID:** 232650

Vanadium		µg/L		
Zinc		µg/L		
Subcontracted Organics				
Phenols	300	µg/L	0.5	21-Aug-03

Data Qualifier Descriptions:

Report Date: Wednesday, September 17, 2003