

December 16, 2003

Environment Canada
Prairie and Northern Region
123 Main Street, Suite 150
Winnipeg, Manitoba
R3C 4W2

Attn: Steve Smith

Re: Eureka Surveillance Network Program 2003

In accordance with the requirements of Water License NWB4EUR9904, issued by the Nunavut Water Board on March 29, 1999, please find attached the results of the Surveillance Network Program (SNP). The SNP required the collection of samples from three locations at the Eureka Weather Station. The locations and results are outlined below.

Raw Water Supply Prior to Treatment

One water sample was collected from the water reservoir on July 9, 2003. The sample was analyzed for nitrate, nitrite, potassium, phosphate, TSS, pH, conductivity, BTEX, halogenated volatiles, and trihalomethane parameters. The chemical analytical results and methodology are located in Appendix A. Several of the results are summarized in Table 1. All of the parameters analyzed did not exceed the laboratory equipment detection limits.

Table 1: Raw Water Supply Analytical Results

Parameter	CCME*	Reservoir
Benzene (mg/L)	0.005 MAC	<0.0005
Toluene (mg/L)	≤0.024 AO	<0.0005
Ethylbenzene (mg/L)	≤0.0024 AO	<0.0005
Xylene (mg/L)	--	<0.0005
Meta/para Xylene	--	<0.0005
Ortho-Xylene	--	<0.0005
Total Xylene	≤0.3 AO	<0.001
Volatile Hydrocarbons (VH6-10)	--	<0.1
VPH	--	<0.1

Nitrite/Nitrate/Nitrogen (mg/L)	45**	<0.005
Total Kjeldahl Nitrogen	--	0.07
Total Phosphate	--	0.008
Potassium	--	1.30
Conductivity (uS/cm)	--	246
pH	--	8.02
Total Suspended Solids	--	<5

*CCME Guidelines for Canadian Drinking Water Quality

MAC – Maximum Acceptable Concentrations

IMAC – Interim Maximum Acceptable Concentrations

AO – Aesthetic Objectives

** - Equivalent to 10mg/L as nitrate-nitrogen

Pond at Toe of Treatment Cell

A surface water sample from the pond located below the treatment cell was collected during the site investigation on July 9th, 2003. The water chemical analyses included nutrient testing, potassium, halogenated volatiles, trihalomethanes, and non-halogenated volatiles. Table 2 illustrates several of the chemical analyses for the samples taken. Full chemical analytical results and methodology can be found in Appendix A.

Table 2: Poned Water At Toe of Treatment Cell

Parameter	Nunavut Guidelines	CCME*	Pond
Benzene (mg/L)	--	370	<0.0005
Toluene (mg/L)	--	2.0	<0.0005
Ethylbenzene (mg/L)	--	90	<0.0005
Xylene (mg/L)	--	--	<0.0005
Meta/para Xylene	--	--	<0.0005
Ortho-Xylene	--	--	<0.0005
Total Xylene	--	--	<0.001
Volatile Hydrocarbons (VH6-10)	--	--	<0.1
VPH	--	--	<0.1
Nitrite/Nitrate Nitrogen (mg/L)	--	**	0.012
Total Kjeldahl Nitrogen	--	--	0.49
Total Phosphate	--	**	0.016

*CCME Water Quality Guidelines - Freshwater

**Currently under development or scheduled for review

--No guideline available

Runoff from the Solid Waste Disposal Facilities

Runoff from this location is to be sampled annually during periods of melt water flow. Site personnel at the Eureka weather station were unsuccessful in acquiring the samples in 2003 due to minimal water available other than ponded water at the landfill toe. Extra effort will be made in acquiring the necessary samples in 2004.

Discharge from the Sewage Lagoon - Prior to Entering the Ocean

The annual discharge from the sewage lagoon occurred on August 19th and 20th, 2003. The discharging of the lagoon took approximately 10 hours total over the 2 day period. The estimated volume of water discharged was 1,500 m³. Samples were collected at approximately 3 hours into the discharging event on the 19th and 2 samples were collected on the 20th near the beginning and end of the pumping event. The samples were sent to ALS Environmental in Vancouver, British Columbia for analyses. The chemical analytical results and methodology are included in Appendix A. The results are summarized in Table 2 below.

Table 3: Analytical Results For Sewage Lagoon Discharge

Parameter	Nunavut Guidelines ¹	Effluent 1	Effluent 2	Effluent 3
BOD (mg/L)	100	74	71	74
pH	6-9	9.06	9.26	9.26
Total Suspended Solids (mg/L)	120	174	127	146
Nitrate (mg/L)	--	<0.05	<0.05	<0.05
Nitrite (mg/L)	--	<0.01	<0.01	<0.01
Total Nitrogen	--	24.1	24.6	25.2
Total Phenols (mg/L)	--	0.078	0.078	0.072
Sodium (mg/L)	--	359	361	363
Magnesium (mg/L)	--	64.0	63.1	62.9
Total Silver (mg/L)	0.1	<0.0001	0.0001	<0.0001
Fecal Coliform (CFU/100ml)	--	2	23	13
Conductivity (uS/cm)	--	2580	2610	2630
Ammonia Nitrogen (mg/L)	--	0.26	0.26	0.23
Oil and Grease (visual)	No visual sheen	No sheen	No sheen	No sheen
Sulphate (mg/L)	--	242	235	230
Potassium (mg/L)	--	26	26	26
Calcium (mg/L)	--	54.9	53.3	53.2

¹ As outlined in the water license

BOLD values indicate that the analytical results are above the Nunavut Guidelines.

-- No guidelines available for discharge

Summary

The ponded water at the toe of the treatment cell did not indicate any parameters above recommended criteria, and in most cases did not exceed the laboratory equipment detection limits.

Runoff from the solid waste disposal facility was not sampled this year and should definitely be sampled in the following fiscal year. A greater attempt should be made to collect this sample.

All three of the samples collected from the lagoon discharge slightly exceeded the Nunavut water license requirements for suspended solids and pH. The pump position within the lagoon is likely the cause of the elevated total suspended solids results. After discharging activities were completed, a sump area was excavated for the pump to provide maximum discharging of liquids. It is anticipated that this will minimize sediment release from the lagoon during discharge in 2004.

Should you require any additional information regarding the 2003 SNP, please do not hesitate to contact me at 780-497-3886.

Sincerely,

Jared Buchko
Senior Environmental Engineer
Environmental Services

Appendix A:
Analytical Results