

**Assessment Study of
Water and Wastewater Systems and
Associated Water Management Practices
at the North Thompson First Nation Community**

**for the
Indian and Northern Affairs Canada
BC Region**



August, 2002

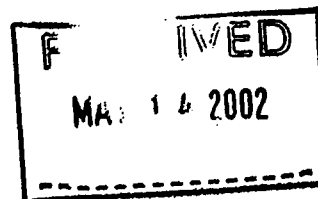
Appendix C

Water Quality Test Results

Page(s) 005495 to\à 005495

Is(are) under consultation

LABORATORY REPORT OF WATER FILTER ANALYSIS
PRINCE GEORGE WATER ASSAY
PO Box 2832 Station A
Prince George, BC V2N 4T6



CONFIDENTIAL

To: Environmental Services
Health Canada, Medical Services Branch
220 - 177 Victoria Street
Prince George, BC V2S 5R8

Sample Number: 317

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: April 29, 2002

Sample Source: Coal Ck. N. Thompson I.B.

Sample Site: Fire Hall

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 1189 litres

Date & Time Received: 04/30/02 22:00 h

Date Processed / Preserved: 04/30/02

Condition of Filter: Straight and Clean

Filter Type: Filterite Cotton

Slides Analyzed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations: The sample was received in 1020 ml of residual water which was not used in the elution process. The sample was processed using 1800 ml of elutant solution from which, 4 X 0.2 ml or less of yellowish-grey precipitate was yielded. This was preserved in 10 % formalin to a final volume of 6 ml. A half millilitre of the concentrate was used representing approximately 99 l of sample. This was submitted to fine density centrifugation and subsequently used in the preparation of the slide.

The slide was richly coated with dead algae of all sorts, bacteria, plant cell fragments, conidia, and pollen.

Giardia Result: Positive Presumptive Negative
Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: No objects conforming to the size and shape of confirmed or presumptive *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were observed on the slide prepared from the material from sample 317.

Results Certified by: R. M. Jarosch
R. M. Jarosch
Prince George Water Assay

Date: May 5, 2002

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Is(are) under consultation

LABORATORY REPORT OF WATER FILTER ANALYSIS
 PRINCE GEORGE WATER ASSAY
 PO Box 2832 Station A
 Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services
 Health Canada, Medical Services Branch
 220 - 177 Victoria Street
 Prince George, BC V2S 5R8

Sample Number: 317

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: April 29, 2002

Sample Source: Coal Ck. N. Thompson I.B.

Sample Site: Fire Hall

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 1189 litres

Date & Time Received: 04/30/02 22:00 h

Date Processed / Preserved: 04/30/02

Condition of Filter: Straight and Clean

Filter Type: Filterite Cotton

Slides Analysed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations: The sample was received in 1020 ml of residual water which was not used in the elution process. The sample was processed using 1800 ml of elutant solution from which, 4 X 0.2 ml or less of yellowish-grey precipitate was yielded. This was preserved in 10 % formalin to a final volume of 6 ml. A half millilitre of the concentrate was used representing approximately 99 l of sample. This was submitted to fine density centrifugation and subsequently used in the preparation of the slide.

The slide was richly coated with dead algae of all sorts, bacteria, plant cell fragments, conidia, and pollen.

Giardia Result: Positive Presumptive Negative

Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: No objects conforming to the size and shape of confirmed or presumptive *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were observed on the slide prepared from the material from sample 317.

Results Certified by:



Date: May 5, 2002

R. M. Jarosch
 Prince George Water Assay

Page(s) 005499 to\à 005501

Is(are) under consultation

LABORATORY REPORT OF WATER FILTER ANALYSIS
 PRINCE GEORGE WATER ASSAY
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CONFIDENTIAL

To: Environmental Services
 Health Canada, Medical Services Branch
 220 - 177 Victoria Street
 Prince George, BC V2S 5R8

Sample Number: 313

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: February 11, 2002

Sample Source: Coal Ck. N. Thompson I.B.

Sample Site: Fire Hall

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 118 l

Date & Time Received: 02/12/02 20:45 h

Date Processed / Preserved: 02/12/02

Condition of Filter: Straight and Clean

Filter Type: Filterite Cotton

Slides Analysed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations: The sample was received in 910 ml of residual water which was used in the elution process. The sample was processed using 1800 ml of elutant solution from which, 4 X 0.05 ml or less of yellow precipitate was yielded. This was preserved in 10 % formalin to a final volume of 5 ml. All of the concentrate was used representing approximately 118 l of sample. This was submitted to fine density centrifugation and subsequently used in the preparation of the slide.

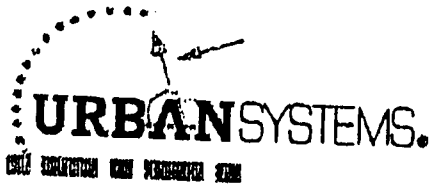
The slide was richly coated with algae of all sorts, bacteria, diatoms, plant matter, and pollen.

Giardia Result: Positive Presumptive Negative
Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: No objects conforming to the size and shape of confirmed or presumptive *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were observed on the slide prepared from the material from sample 313.

Results Certified by: R. M. Jarosch
 R. M. Jarosch
 Prince George Water Assay

Date: February 15, 2002



FAX MEMORANDUM

RECEIVED
JAN - 4 2002

FAXED

DATE: January 4, 2002

PAGES: 7

TO: Paul Blackett

FAX #: 372-9398

CC: Eddie Celesta

FROM: Julia Peterson

FILE#: 7174708.1

SUBJECT: **LOUISE JULES WATER QUALITY ANALYSIS**

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We sampled North Thompson's Louise Jules Well on December 17, 2001 in accordance to the recommendations made in the Louise Jules Ground Water Supply Investigation report dated February 2, 2001.

As discussed with Lisa Clarke, the water quality analysis results were not as expected, with some parameters higher than CDWQG. You will find the analysis report attached.

Please review the report and provide recommendations.

Lisa is available if you have questions regarding this fax.

URBAN SYSTEMS LTD.

Julia Peterson, E.I.T.

Eddie,

I will call you later today to discuss

Julia

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ALSO: LABORATORY SERVICES LTD
1888 Triumph Street, Vancouver, BC Canada V6L 1K5
Phone: 604-253-4189 Toll Free: 1-800-465-0243 Fax: 604-253-6700 Website: www.alsenviro.com



ALS Environmental

FAX

ATTENTION Ms. Julia Peterson

FAX NO (12503745334)

COMPANY Urban Systems Ltd.

DATE Friday December 28, 2001

CC

NO OF PAGES 7

INCL COVER

FROM Amber Springer

SUBJECT 7174708.1 Water Analysis

This facsimile message contains privileged information intended only for the use of the addressee.
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and return it to the sender.

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CHEMICAL ANALYSIS REPORT

Date: INTERIM
ALS File No. N9150
Report On: 7174708.1 Water Analysis
North Thompson Indian Band
Report To: Urban Systems Ltd.
200 - 286 St. Paul Street
Kamloops, BC
V2C 6G4
Attention: Ms. Julia Petersoff
Received: December 18, 2001

ALS ENVIRONMENTAL
per:

Amber Springer, B.Sc. - Project Chemist
Brent C. Mack, B.Sc. - Project Chemist

RESULTS OF ANALYSIS - Water

File No. N9159

Sample ID

LJ-
12/17/01

Sample Date
Sample Time
ALS ID

01 12 17
11:30
1

Physical Tests

Total Dissolved Solids
Hardness CaCO₃
Turbidity (NTU)

417
344
9.4

≤ 500 (AO)
1 (MHC) ≤ 5 (AO)

Bacteriological Tests

Coliform Bacteria - Fecal
Coliform Bacteria - Total

<1
<1

≤ 0 / 100 mL (MHC)
≤ 0 / 100 mL (MHC) ?

Results are expressed as milligrams per litre except where noted.
< = less than the detection limit indicated.
Coliform results are expressed as Colony Forming Units (CFU) per 100 mL.

DRAFT

Page(s) 005507 to\à 005507

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est(sont) (des) duplicata(s)**

LABORATORY REPORT OF WATER FILTER ANALYSIS
PRINCE GEORGE WATER ASSAY

PO Box 2832 Station A
Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services
Health Canada, Medical Services Branch
220 - 177 Victoria Street
Prince George, BC V2S 5R8

Sample Number: 313

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: February 11, 2002

Sample Source: Coal Ck. N. Thompson I.B.

Sample Site: Fire Hall

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 118 l

Date & Time Received: 02/12/02 20:45 h

Date Processed / Preserved: 02/12/02

Condition of Filter: Straight and Clean

Filter Type: Filterite Cotton

Slides Analysed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations: The sample was received in 910 ml of residual water which was used in the elution process. The sample was processed using 1800 ml of elutant solution from which, 4 X 0.05 ml or less of yellow precipitate was yielded. This was preserved in 10 % formalin to a final volume of 5 ml. All of the concentrate was used representing approximately 118 l of sample. This was submitted to fine density centrifugation and subsequently used in the preparation of the slide.

The slide was richly coated with algae of all sorts, bacteria, diatoms, plant matter, and pollen.

Giardia Result: Positive Presumptive Negative

Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: No objects conforming to the size and shape of confirmed or presumptive *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were observed on the slide prepared from the material from sample 313.

Results Certified by: R. M. Jarosch
R. M. Jarosch
Prince George Water Assay

Date: February 15, 2002

RESULTS OF ANALYSIS - Water

File No. N9159

Sample ID

LJ-
12/17/01

Sample Date
Sample Time
ALS ID

01 12 17
11:30
1

Total Metals

Aluminum	T-Al	<0.2	
Antimony	T-Sb	<0.2	
Arsenic	T-As	<0.2	
Barium	T-Ba	0.04	0.025 (MAC)
Beryllium	T-Be	<0.005	0.0 (MAC)
Bismuth	T-Bi	<0.2	
Boron	T-B	<0.1	0.3 (MAC)
Cadmium	T-Cd	<0.01	0.005 (MAC)
Calcium	T-Ca	61.1	
Chromium	T-Cr	<0.01	0.05 (MAC)
Cobalt	T-Co	<0.01	
Copper	T-Cu	<0.01	
Iron	T-Fe	0.96	≤ 40 (AO) *
Lead	T-Pb	<0.05	≤ 0.3 (AO)
Lithium	T-Li	<0.01	0.010 (MAC)
Magnesium	T-Mg	50.5	
Manganese	T-Mn	0.102	≤ 0.05 (AO)
Molybdenum	T-Mo	<0.03	
Nickel	T-Ni	<0.05	
Phosphorus	T-P	<0.3	
Potassium	T-K	4	
Selenium	T-Se	<0.2	0.01 (MAC)
Silicon	T-Si	10.6	
Silver	T-Ag	<0.01	
Sodium	T-Na	32	≤ 200 (AO)
Strontium	T-Sr	0.415	
Thallium	T-Tl	<0.2	
Tin	T-Sn	<0.03	
Titanium	T-Ti	<0.01	
Vanadium	T-V	<0.03	
Zinc	T-Zn	0.033	≤ 5.0 (AO) *

* at point of consumption

Results are expressed as milligrams per litre except where noted
 < = less than the detection limit indicated.
 Coliform results are expressed as Colony Forming Units (CFU) per 100 ml.

DRAFT

RESULTS OF ANALYSIS - Water

File No. N9159

Sample ID	LJ- 12/17/01
Sample Date	01 12 17
Sample Time	11:30
ALS ID	1

Dissolved Metals

Aluminum	D-Al	<0.2
Antimony	D-Sb	<0.2
Arsenic	D-As	<0.2
Barium	D-Ba	0.04
Beryllium	D-Be	<0.005
Bismuth	D-Bi	<0.2
Boron	D-B	<0.1
Cadmium	D-Cd	<0.01
Calcium	D-Ca	58.4
Chromium	D-Cr	<0.01
Cobalt	D-Co	<0.01
Copper	D-Cu	<0.01
Iron	D-Fe	0.80
Lead	D-Pb	<0.05
Lithium	D-Li	<0.01
Magnesium	D-Mg	48.1
Manganese	D-Mn	0.097
Molybdenum	D-Mo	<0.03
Nickel	D-Ni	<0.05
Phosphorus	D-P	<0.3
Potassium	D-K	4
Selenium	D-Se	<0.2
Silicon	D-Si	10.1
Silver	D-Ag	<0.01
Sodium	D-Na	30
Strontium	D-Sr	0.397
Thallium	D-Tl	<0.2
Tin	D-Sn	<0.03
Titanium	D-Ti	<0.01
Vanadium	D-V	<0.03
Zinc	D-Zn	0.039

Results are expressed as milligrams per litre except where noted.
 < = Less than the detection limit indicated.
 Coliform results are expressed as Colony Forming Units (CFU) per 100 ml.

DRAFT

METHODOLOGY

File No. N9159

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows:

Solids in Water

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total dissolved solids (TDS) and total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter. TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius. TSS is determined by drying the filter at 104 degrees celsius. Total solids are determined by evaporating a sample to dryness at 104 degrees celsius. Fixed and volatile solids are determined by igniting a dried sample residue at 550 degrees celsius.

Recommended Holding Time:

Sample: 7 days

Reference: APHA

For more detail see ALS Environmental "Collection & Sampling Guide"

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewater, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Turbidity of Water

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

Recommended Holding Time:

Sample: 2 days

Reference: APHA

For more detail see ALS Environmental "Collection & Sampling Guide"

Coliform Bacteria in Water by Membrane Filtration

This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is determined by colony counting. A known sample volume is

METHODOLOGY (cont'd)

File No. N9159

filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation of the filter with the appropriate growth medium, positive results require further testing (up to an additional 48 hours) to confirm and quantify the total and fecal coliform. This method is used for non-turbid water with a low background bacteria level.

Recommended Holding Time:

Sample: 1 day

Reference: APHA

For more detail see ALS Environmental "Collection & Sampling Guide"

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:

6 months

Reference:

EPA

For more detail see:

ALS "Collection & Sampling Guide"

End of Report

Page(s) 005513 to\à 005518

Is(are) under consultation

LABORATORY REPORT OF WATER FILTER ANALYSIS
PRINCE GEORGE WATER ASSAY
PO Box 2832 Station B
Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services
Health Canada, Medical Services Branch
220 - 177 Victoria Street
Prince George, BC V2S 5R8

Sample Number: 293

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: October 17, 2001

Sample Source: Coal Creek

Sample Site: Fire Hall

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 590 l

Date & Time Received: 10/18/01 19:45h

Date Processed / Preserved: 10/18/01

Condition of Filter: like new, straight with no discoloration

Filter Type: Filterite Cotton

Slides Analysed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations:

Sample came in 380 ml of residual water which was discarded. The sample was eluted with 1800 ml of solution from which 4 x 0.10 ml or less of brown ppt was recovered and was resuspended with 10% formalin (V_f = 4.0 ml) for further processing. One millilitre of preserved sample was drawn, representing approx. 148 l of sample, to be subjected to fine density centrifugation and further analysis.

This sample contained many algae species, amoebae and nematodes. There were a few conidia, crustaceans, diatoms and some fragments of leaves or some other vegetative matter.

Giardia Result:

Positive Presumptive Negative

Cryptosporidium Result:

Positive Presumptive Negative

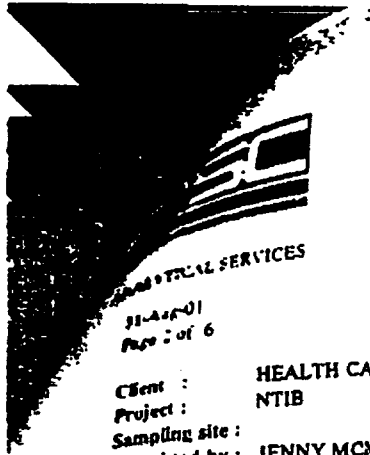
Summary and Conclusion: One object was found conforming to the size and shape of a presumptive *Giardia* cyst was found in the material recovered from sample 293. No objects conforming to confirmed or presumptive *Cryptosporidium* oocysts were found.

Results Certified by: R. M. Jarosch
R. M. Jarosch
Prince George Water Assay

Date: October 25, 2001

Page(s) 005520 to\à 005521

Is(are) under consultation



ANALYTICAL REPORT

31-Aug-01
Page : of 6

Client : HEALTH CANADA
Project : NTIB
Sampling site :
Submitted by : JENNY MCMILLAN

Philip ID : 11051187 11051188
Client ID : BAND OFFICE BRENDA CEL
ESTA #545

Sparcode	Parameter	Unit	MDL	CDWG		
VOLATILE ORGANICS-TRihalOMETHANES						
EX995172	Volat. Wat. Pre-Scr.	date			01/08/27	01/08/27
B012MS01	Bromodichloromethane	ug/L	0.4	---	0.9	0.8
B013MS01	Bromoform	ug/L	0.3	---	< 0.3	< 0.3
C032MS01	Chloroform	ug/L	0.4	---	50	41
C033MS01	Dibromochloromethane	ug/L	0.4	---	< 0.4	< 0.4
VOC SURROGATE RECOVERY						
VS03MS01	d8-Toluene	%	70	---	103	110
				Matrix :	Water	Water
				Sampled on:	01/08/22 10:35	01/08/22 10:50

LABORATORY REPORT OF WATER FILTER ANALYSIS
PRINCE GEORGE WATER ASSAY
PO Box 2832 Station B
Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services
Health Canada, Medical Services Branch
220 - 177 Victoria Street
Prince George, BC V2S 5R8

Sample Number: 284

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: September 19, 2001

Sample Source: Coal Ck. N. Thompson I.B.

Sample Site: Band Office

Treatment: Chlorination

Sample sent by: Danielle Audet

Volume Filtered: 597.2 l

Date & Time Received: 09/21/01 21:45

Date Processed / Preserved: 09/21/01

Condition of Filter: Quite white, almost like new, both ends flared

Filter Type: Filterite Cotton

Slides Analysed: 1

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations: The sample was received in 235 ml of residual water which was discarded. It was subsequently processed using 1800 ml of elutant solution from which, 4 X 0.125 ml or less of concentrated precipitate was yielded. This was preserved in 10 % formalin to a final volume of 4 ml. From the concentrate one ml representing approximately 149 l of sample was submitted to fine density centrifugation and subsequently used in the preparation of the slide.

The slide revealed a great variety of organisms and other organic products such as pollen, wood cells, nematodes, amoebae, a large numbers of a single algal species. Amongst this plethora were *Giardia* cysts and remnants of several (5) shattered cysts.

Giardia Result: Positive Presumptive Negative

Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: Three confirmed *Giardia* cysts were found in the volume of 149 l which means that there appears to be at least 2 cysts/100 l of sample. There is at least another 3 presumptive cysts/100 l of sample. Photos attached.

Results Certified by:

R. M. Jarosch
R. M. Jarosch

Prince George Water Assay

Date: September 28, 2001

Page(s) 005524 to\à 005527

Is(are) under consultation

Page(s) 005528 to\à 005528

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est(sont) (des) duplicata(s)**

Page(s) 005529 to\à 005538

Is(are) under consultation

KALA GROUNDWATER CONSULTING LTD.

#3 - 3107A - 31st Avenue #207 - 220 4th Avenue.
 ☐ Vernon, B.C. - V1T 2G9 ☐ Kamloops, B.C. - V2C 3N6
 Tel (250) 545-1720 Tel (250) 372-9194
 Fax (250) 545-1720 Fax (250) 372-9398

TECHNICAL MEMORANDUM

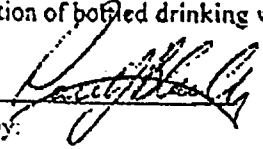
Date: 1/10/02 Our File Ref: 00319
From: Paul Blackett A.Sc.T
To: USL Kamloops Attention: Julia Peterson, E.I.T.
PROJECT: NORTH THOMPSON BAND
Re: GROUNDWATER QUALITY s.19(1)

Further to your fax memorandum dated January 4, 2001 regarding the above project Kala has reviewed the November 20, 2000 water sample in comparison to the December 17, 2001 sample. Table 1 summarizes elevated parameters between the two tests.

Analytical Chemistry Parameters that Exceed Criteria			
Parameter	Louise Jules Well November 20, 2000	Louise Jules Well December 17, 2001	SGCDWQ 2001
Turbidity	2	9.4	1.0 MAC
Total Iron	0.324	0.96	<0.3 AO
Total Manganese	0.078	0.102	≤0.05 AO

SGCDWQ 2001 - Summary of Guidelines for Canadian Drinking Water Quality - 2001
 AO = Aesthetic Objective
 MAC = Maximum Acceptable Concentration
 Bold = Exceeds SGCDWQ 2001

It was noted that the ASL detection limits for aluminum, antimony and arsenic exceed the SGCDWQ criteria. The groundwater quality findings are similar with increased metals concentrations partially impacted by the higher turbidity. Kala recommends repumping this well for up to four hours and sampling for the above parameters. A water sample volume of up to 1,000 L would be processed through a conventional ion exchange softener with iron removal filter and a reverse osmosis system. Water samples would be collected pre and post treatment to determine existing water quality and determine whether water treatment at the source is viable. Consideration of bottled drinking water may be addressed. If there are questions contact the undersigned.


 Prepared by:
 Paul J. Blackett, A.Sc.T.

PJB/lh/00319-M00319-0110

Page(s) 005540 to\à 005560

Is(are) under consultation



ENVIRONMENTAL TESTING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ASSAYING

10041 E. Trans Canada Hwy.. R.R. #2. Kamloops, B.C. V2C 2J3 Phone (604) 573-5700
Telex: 048-8393

April 18, 1986

ANALYTICAL RESULTS

CLIENT: Civic Engineering Services
332 Victoria Street
KAMLOOPS, B. C.
V2C 2A5

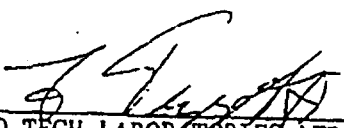
ATTENTION: Neil Ramsay, P. Eng.

SAMPLE IDENTIFICATION: 1 water sample received March 26, 1986 labelled
"Water Well - North Thompson I.R. No. 1 - March 26/86"

PARAMETER:

Mercury (mg/l) <0.0005

NOTE: < = less than



ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
Laboratory Manager

FJP/SMT/mil



Civic Engineering Services Ltd.

330 VICTORIA STREET
KAMLOOPS B.C. V2C 2A5
TEL 374-2200

TABLE 1

ANALYTICAL RESULTS

WELL AT NORTH THOMPSON I.R. No. 1

PARAMETER:

	<u>North Thompson I.R. No. 1</u>	<u>Recommended Limits</u>
pH (units)	8.03	6.5 - 8.5
Total Dissolved Solids	171	500
Alkalinity, hydroxide (as CaCO_3)	< .2	
Alkalinity, carbonate (as CaCO_3)	4.1	
Alkalinity, bicarbonate (as CaCO_3)	126	
Hardness (as CaCO_3)	134	500
Sulfate (as SO_4)	< 2.0	500
Sulfide (as H_2S)	3.1	0.05
Nitrite + Nitrate (as N)	.14	10.0
Fluoride	.12	1.5
Sodium	24.5	20.0
Iron, total	< .001	0.3
Iron, dissolved	< .001	0.3
Manganese, total	0.03	0.05
Manganese, dissolved	0.03	0.05
Calcium, dissolved	37.6	
Magnesium, dissolved	9.6	
Potassium	2.0	
Turbidity (NTU)	1.2	5
Conductivity (micromhos/cm)	267	
Colour	2	15

NOTES: < = Less than

All results expressed in mg per litre unless otherwise specified.



ENVIRONMENTAL TESTING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ASSAYING

10041 E. Trans Canada Hwy. R.R. #2, Kamloops, B.C. V2C 2J3 Phone (604) 573-5700
Telex: 048-839.

April 4, 1986.

ANALYTICAL RESULTS

CLIENT: Civic Engineering Services
332 Victoria Street
KAMLOOPS, B. C.
V2C 2A5

ATTENTION: Neil Ramsay

SAMPLE IDENTIFICATION: 1 water sample received March 26/86, labelled as follows: "Water Well - North Thompson I. R. No. 1 - March 26 /86"

PARAMETER:

Physical Tests:

pH (units)	8.08
Conductivity (micromhos/cm)	227.
Colour (Co/Pt units)	<2.
Turbidity (NTU)	1.5
Hardness (as CaCO ₃)	99.2

Solids:

Total Dissolved	205.
-----------------	------

Dissolved Anions:

Alkalinity, bicarbonate (as CaCO ₃)	139.
Alkalinity, carbonate (as CaCO ₃)	14.4
Alkalinity, hydroxide (as CaCO ₃)	<0.5
Chlorides (as Cl)	<0.5
Sulfates (as SO ₄)	3.8
Nitrogen Oxides (as N)	0.029
Fluorides (as F)	0.13
Hydrogen Sulfide	0.04

.../2

April 4, 1986.

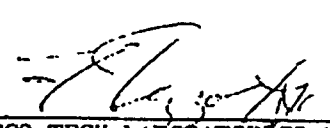
Dissolved Metals:

Calcium (as Ca)	26.8
Iron (as Fe)	<0.01
Magnesium (as Mg)	7.70
Manganese (as Mn)	<0.01
Potassium (as P)	1.8
Sodium (as Na)	25.2

Total Metals:

Iron (as Fe)	0.01
Manganese (as Mn)	<0.01
Cadmium (as Cd)	<0.01
Arsenic (as As)	<0.005
Copper (as Cu)	0.02
Lead (as Pb)	<0.01
Zinc (as Zn)	0.03
Mercury (as Hg)	*

NOTES: < = less than
All results expressed in mg per litre unless otherwise specified.
* = Result to be submitted when complete



ECO-TECH LABORATORIES LTD.
Frank J. Pezzotti, A.Sc.T.
Laboratory Manager

FJP/SMT/cm

Page(s) 005565 to\à 005567

Is(are) under consultation



NORTHWEST LABS

Edmonton	Ph (403) 438-5522	FAX (403) 438-0396
Calgary	Ph (403) 291-2022	FAX (403) 291-2021
Lethbridge	Ph (403) 329-9266	FAX (403) 327-8527
Winnipeg	Ph (204) 982-8630	FAX (204) 275-6019

Client Code: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
Address: #207, 220 - 4TH AVE.,

KAMLOOPS
BC V2C 3N6
Attn: PAUL BLACKETT
Phone: (250) 372-9194
Fax: (250) 372-9398

Workorder: 58459
WO (Other): 96307
PO Num: 319
Project: NTIB
Date Sampled: Nov 02, 2000
Date Received: Nov 23, 2000
Date Reported: Dec 19, 2000

Metal Analysis

	Detection		58459-1
	Limit	Units	TW00-01
Graphite Furnace-Diss Arsenic-Water			
Arsenic	0.003	mg/L	<0.003
Graphite Furnace-Diss Selenium-Water			
Selenium	0.002	mg/L	<0.002
Graphite Furnace-Total Arsenic-Water			
Arsenic	0.003	mg/L	<0.003
Graphite Furnace-Total Selenium-Water			
Selenium	0.002	mg/L	<0.002



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Workorder: 58459

WO (Other): 96307

PO Num: 319

Project: NTIB

Date Sampled: Nov 02, 2000

Date Received: Nov 23, 2000

Date Reported: Dec 19, 2000

Metal Analysis

	Detection Limit	Units	58459-1 TW00-01
<i>ICP Semi-Trace Scan - Dissolved Metals in Water</i>			
Aluminum	0.01	mg/L	<0.01
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.0346
Beryllium	0.0002	mg/L	<0.0002
Bismuth	0.02	mg/L	<0.02
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	50.5
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	<0.002
Iron	0.003	mg/L	0.007
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	37.9
Manganese	0.0005	mg/L	0.0751
Molybdenum	0.005	mg/L	0.006
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.07
Potassium	0.2	mg/L	3.9
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	9.9
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	31.1
Strontium	0.005	mg/L	0.363
Sulphur	0.1	mg/L	18.2
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	0.01
Titanium	0.001	mg/L	<0.001
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	0.002
Zinc	0.001	mg/L	0.004
Zirconium	0.001	mg/L	<0.001



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Client Code: KALGRO

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 Address: #207, 220 - 4TH AVE.,


KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

Metal Analysis

	Detection Limit	Units	58459-1 TW00-01
<i>ICP Semi-Trace Scan - Total Metals in Water</i>			
Aluminum	0.01	mg/L	<0.01
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.0365
Beryllium	0.0002	mg/L	<0.0002
Bismuth	0.02	mg/L	<0.02
Boron	0.01	mg/L	<0.01
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	52.3
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	0.002
Iron	0.003	mg/L	0.324
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	39.3
Manganese	0.0005	mg/L	0.078
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.005	mg/L	0.007
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.07
Potassium	0.2	mg/L	4
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	10.1
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	32.5
Strontium	0.005	mg/L	0.377
Sulfur	0.1	mg/L	18.9
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	0.01
Titanium	0.001	mg/L	<0.001
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	0.002
Zinc	0.001	mg/L	0.004
Zirconium	0.001	mg/L	<0.001

Approved By:


 John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab

005570



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 Lethbridge Ph (403) 329-9286 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Order: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

	Detection Limit	Units	TW00-01
Alkalinity - total			
Total Alkalinity	5	mg CaCO ₃ /L	280
Chloride in Water by IEC			
Chloride	0.05	mg/L	0.54
Colour - True			
Colour	5	TCU	<5
Electrical Conductivity			
Electrical Conductivity	0.01	µS/cm	690
Fluoride in Water			
Fluoride	0.5	mg/L	<0.5
Gross Alpha			
Gross Alpha	0.22	Bq/L	<0.22
Gross Beta			
Gross Beta	0.14	Bq/L	<0.14
Hardness			
Hardness (CaCO ₃ equiv)	5	mg/L	282
Nitrogen - Nitrate in Water			
Nitrate-N	0.05	mg/L	<0.05
Nitrogen - Nitrite + Nitrate in Water			
Nitrate-N (+ Nitrite-N)	0.05	mg/L	<0.05
Nitrogen - Nitrite in Water			
Nitrite-N	0.5	mg/L	<0.5
pH in Water			
pH	0.01	pH	8.08
Solids - Dissolved			
Total Dissolved Solids	5	mg/L	428
Phosphate in Water			
Phosphate	1	mg/L	60

Water Analysis

005571



NORTHWEST LABS

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 Cal Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Order: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459

WO (Other): 96307

PO Num: 319

Project: NTIB

Date Sampled: Nov 02, 2000

Date Received: Nov 23, 2000

Date Reported: Dec 19, 2000

	Detection Limit	Units	TW00-01
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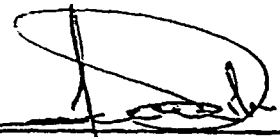
Trihalomethane Formation Potential

Chloroform	1	ug/L	25.7
Bromoform	1	ug/L	<1
Bromodichloromethane	1	ug/L	8.5
Chlorodibromomethane	1	ug/L	2.7

Turbidity

Turbidity	0.1	NTU	2
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Approved By:


 John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab



Analytical Report

Bay 6, 2712-37 Avenue N.E.
Calgary, AB. T1Y-5L3
Phone: (403) 291-2022
Fax: (403) 291-2021

Agri-Feed & Environmental Group
Calgary Edmonton Winnipeg Lehighbridge Surrey

Bill to: Kala Groundwater Consulting
Report to: Kala Groundwater Consulting

207. 220 - 4 Avenue
Kamloops, BC, Canada
V2C 3N6
Attn: Paul Blackett

Project ID: 00319
Name: NTIB
Location:
LSD:
P.O.: 00319
Acct. Code: 58459

NWL Lot ID: 96307
Control Number: E 31793
Date Received: Nov 23, 2000
Date Reported: Dec 19, 2000
Report Number: 136422

Sampled By: SC
Kala

Page: 1 of 2

NWL Number: 96307-1
Sample Date: Nov 02, 2000
Sample Description: TW00-01 58459-1

Analyte	Units	Results	Results	Results	Detection Limit
Microbiological Analysis					
Total Coliforms	Membrane Filtration	CFU/100 mL	<1		
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<1		
Heterotrophic (Standard) Plate Count - Aerobic	Membrane Filtration	CFU/100 mL	52		

Approved by: _____

John Davidson



QA/QC for WO#

58459-1

Input data

Al	0	CO3	0
Ca	50.5	HCO3	280
Fe	0.007	EC	690
Mg	37.9	TDS	428
Mn	0.0751	F	0
K	3.9	Cl	0.54
Si	9.9	NO2-N	0
Na	31.1	NO3-N	0
NH3-N	0	SO4	60

ionic balance

cation sum =	7.10		
anion sum =	6.86		
difference =	0.23	meq/L or	1.67 %
	difference (+/-)		if anion sum
acceptable =	0.2	meq/L	0 - 3
acceptable =	2	%	3 - 10
acceptable =	2.5	%	10 - 800

PASS



**NORWEST
LABS**

403 291 2021 10 12065729398

P.02/06

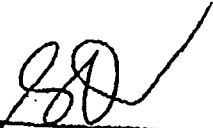
Kala Groundwater Consulting
207, 220 - 4 Avenue
Kamloops, BC V2C 3N6
Fax: (250) 372-9398
Phone: (250) 372-9194

Date: 19-Dec-00
P.O #:
Order #:
Work Order #: 96307

Attn: Paul Blackett

Predominant Bacteria Identification Report

Work Order	Sample Description	CFU/100ml	Identification	Likely Habitat
96307-1 Surrey # 58459-1	TW00-01	(i) 30	(i) <i>Pseudomonas stutzeri</i>	(i) Soil and water
		(ii) 21	(i) <i>Pseudomonas alcaligenes</i>	(ii) Swimming pool water


 M. Aqueel Athar, MS., PhD., MPH

Identifications performed by Epcor Water Services Inc., Edmonton, AB

SRC ANALYTICAL

422 Downey Road
Saskatoon, Saskatchewan S7N 4N1
(306) 933-6932 1-800-240-8808
Fax: (306) 933-7922

Kala Groundwater Cons. Ltd
207-220 4th Avenue
Kamloops, B.C. V2C 3N6
Attn: Kristine Hagel

Date Samples Received: 22-Nov-00 Client P.O.:

Analysis has been reviewed by:



Dave Chorney
Radiochemistry and SLOWPOKE II Supervisor

- Test methods and data are validated by the laboratory's Quality Assurance Program. SRC Analytical is accredited by the Standards Council of Canada (SCC), in cooperation with the Canadian Association for Environmental Analytical Laboratories (CAEAL). Specific tests are listed in the scope of accreditation approved by the SCC.
- Routine methods follow recognized procedures from sources such as:
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
 - Environment Canada
 - US EPA
 - CANMET
- Samples will be kept for 30 working days after the final report is sent. Please contact the lab if you have any special requirements.

SRC ANALYTICAL

422 Downey Road
 Saskatoon, Saskatchewan S7N 4N1
 (306) 933-6932 1-800-240-8808

Kala Groundwater Cons. Ltd
 207-220 4th Avenue
 Kamloops, B.C. V2C 3N6
 Attn: Kristine Hagel

06-Dec-00 14:15

Date Samples Received: 22-Nov-00 Client P.O.:

SAMPLE CLIENT DESCRIPTION
 24293 WELL 1 OCT 23/00 (PREV SRC GRP 00-5080 LAB# 22464) *WATER*

ANALYTE	UNITS	24293
RADIONUCLIDES		
Polonium-210	Bq/L	<0.006
Thorium-228	Bq/L	<0.01
Thorium-230	Bq/L	0.03
Thorium-232	Bq/L	<0.01

<: not detected at level stated above.



NORTHWEST LABS

Client Code: KALGRO

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 Calgary Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Name: KALA GROUNDWATER CONS. LTD. Address: #207, 220 - 4TH AVE., KAMLOOPS BC V2C 3N6 Attn: PAUL BLACKETT Phone: (250) 372-9194 Fax: (250) 372-9398	Workorder: 39009 WO (Other): PO Num: 98238 Project: NORTH THOMPSON BAND Date Sampled: 05/10/98 Date Received: 06-Oct-98 Date Reported: 16-Nov-98
--	--

Metal Analysis

RECEIVED

	Detection Limit	Units	39009-1
			TW 98-01 NORTH THOMPSON INDIAN BAND
<i>Dissolved Semi-Trace Metals Scan in Water</i>			
Aluminum	0.01	mg/L	0.03
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.0181
Beryllium	0.0002	mg/L	0.0005
Bismuth	0.02	mg/L	<0.02
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	79.5
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	0.018
Iron	0.003	mg/L	0.004
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	32.1
Manganese	0.0005	mg/L	0.0014
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.005	mg/L	<0.005
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.36
Potassium	0.2	mg/L	1.4
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	9.37
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	14.6
Strontium	0.005	mg/L	0.28
Sulphur	0.1	mg/L	17.6
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	<0.005
Titanium	0.001	mg/L	0.002
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	0.002
Zinc	0.001	mg/L	0.035
Zirconium	0.001	mg/L	0.014

Graphite Furnace-Dis Arsenic-Water

Arsenic	0.003	mg/L	<0.003
---------	-------	------	--------

Graphite Furnace-Dis Selenium-Water

Selenium	0.002	mg/L	<0.002
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Graphite Furnace-Total Arsenic-Water

Arsenic	0.003	mg/L	<0.003
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Graphite Furnace-Total Selenium-Water

Selenium	0.002	mg/L	<0.002
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 Lethbridge Ph (403) 329-8266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-8019


Name: KALA GROUNDWATER CONS. LTD. Address: #207, 220 - 4TH AVE., KAMLOOPS BC V2C 3N6 Attn: PAUL BLACKETT Phone: (250) 372-9194 Fax: (250) 372-9398	Workorder: 39009 WO (Other): PO Num: 98238 Project: NORTH THOMPSON BAND Date Sampled: 05/10/98 Date Received: 06-Oct-98 Date Reported: 16-Nov-98
--	--

Metal Analysis

39009-1
 TW 98-01 NORTH
 THOMPSON
 INDIAN BAND

	Detection Limit	Units	
Total Semi Trace Metals in Water			
Aluminum	0.01	mg/L	0.02
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.017
Beryllium	0.0002	mg/L	0.0005
Bismuth	0.02	mg/L	<0.02
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	74.8
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	0.018
Iron	0.003	mg/L	0.075
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	30
Manganese	0.0005	mg/L	0.0011
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.005	mg/L	<0.005
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.32
Potassium	0.2	mg/L	1.2
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	8.92
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	14
Strontium	0.005	mg/L	0.256
Sulfur	0.1	mg/L	16.6
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	0.006
Titanium	0.001	mg/L	0.002
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	<0.002
Zinc	0.001	mg/L	0.036
Zirconium	0.001	mg/L	0.013

Approved By:


 John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab



NORTHWEST LABS

Surrey Ph (604) 514-3322 FAX (604) 514-3323
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 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO


Name: KALA GROUNDWATER CONS. LTD. Address: #207, 220 - 4TH AVE., KAMLOOPS BC V2C 3N6 Attn: PAUL BLACKETT Phone: (250) 372-9194 Fax: (250) 372-9398	Workorder: 39009 WO (Other): PO Num: 98238 Project: NORTH THOMPSON BAND Date Sampled: 05/10/98 Date Received: 06-Oct-98 Date Reported: 16-Nov-98
--	--

Microbiological Analysis

39009-1

TW 98-01 NORTH THOMPSON INDIAN BAND

	Detection Limit	Units	
Background Count			
Background Count	1	cfu/100 mL	24
Bacterial Identification			
Bacterial Identification			Acinetobacter Radioresistens Pseudomonas Stutzeri
Standard Plate Count			
Standard Plate Count	1	cfu/mL	15
Total and Fecal Coliforms (MF)			
Total Coliforms	1	cfu/100 mL	35
Fecal Coliforms	1	cfu/100 mL	14

Approved By: 
 John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab



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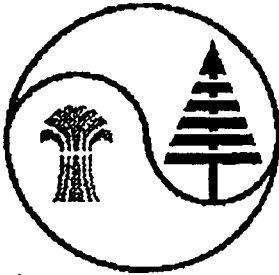
Water Analysis

39009-1
 TW 98-01 NORTH
 THOMPSON
 INDIAN BAND

	Detection Limit	Units	
Alkalinity, total			
Total Alkalinity	5	mg CaCO3/L	370
Chloride in Water			
Chloride	0.1	mg/L	0.6
Colour			
Colour	5	TCU	<5
Electrical Conductivity			
Electrical Conductivity	0.01	µS/cm	750
Fluoride in Water			
Fluoride	0.5	mg/L	<0.5
Gross Alpha			
Gross Alpha	0.12	Bq/L	0.31±0.09
Gross Beta			
Gross Beta	0.25	Bq/L	0.4±0.16
Hardness			
Hardness (CaCO3 equiv)	5	mg/L	331
Nitrate + Nitrite Nitrogen			
Nitrate-N (+ Nitrite-N)	0.05	mg/L	<0.05
Nitrate - Nitrogen in Water			
Nitrate-N	0.05	mg/L	<0.05
Nitrite Nitrogen			
Nitrite-N	0.003	mg/L	<0.003
pH in Water			
pH	0.01	pH	7.92
Sulphate in Water			
Sulphate	1	mg/L	57
Total Dissolved Solids			
Total Dissolved Solids	5	mg/L	438
Turbidity			
Turbidity	1	NTU	<1

Approved By:

John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab



**NORWEST
LABS**

QA/QC for WO#

39009-1

input data

Al	0.03	CO3	0
Ca	79.5	HCO3	320
Fe	0.004	EC	750
Mg	32.1	TDS	438
Mn	0.0014	F	0
K	1.4	Cl	0.6
Si	9.37	NO2-N	0
Na	14.6	NO3-N	0
NH3-N	0	SO4	53

ionic balance

cation sum =	7.28			
anion sum =	7.52			
difference =	-0.24	meq/L or	1.60 %	
		difference (+/-)	if anion sum	
acceptable =	0.2	meq/L	0 - 3	
acceptable =	2	%	3 - 10	PASS
acceptable =	2.5	%	10 - 800	

100 x cation or anion sum = 0.9 to 1.1 X EC

csum x 100 =	728		PASS
asum x 100 =	752		PASS
acceptable =	675	to	825

TDS/EC

TDS/EC =	0.58	PASS
acceptable =	0.55 - 0.7	

measured TDS / calc. TDS

calc TDS =	399	
mTDS/cTDS =	1.10	PASS
acceptable =	1 to 1.2	

Parameter	CDWQG 1996 Drinking Water MAC = Maximum Acceptable Concentration AO = Aesthetic Concentration	BCWQG 1994	
		Drinking Water	Aquatic Life Freshwater
pH (units)	6.5 - 8.5 AO	6.5 - 8.5	6.5 - 9.0
Colour (CTU)	<15 AO	15	-
Specific Conductance (uS/cm)	-	-	-
Total Dissolved Solids (mg/L)	<500 AO	500	-
Turbidity (NTU)	1 MAC <5 AO	1 - <5	5
Total Hardness (mg/L)	-	200 - <500	-
Total Alkalinity (mg/L)	-	30 - 250 ³	<10
Chloride (mg/L)	<250 AO	250	-
Fluoride (mg/L)	1.5 MAC	1.5	0.3 ⁴
Nitrate (mg/L)	45 ¹ MAC	10	200
Nitrite (mg/L)	3.2 MAC	1	0.06
Sulfate (mg/L)	<500 AO	500	100
Total Coliform (CFU/0.1L)	0/100mL MAC	-	-
Fecal Coliform (CFU/0.1L)	0/100mL MAC	0	<14
Heterotrophic Plate Count	500/mL MAC	-	-
Standard Plate Count	200 background MAC	-	-
TOTAL METALS (mg/L)			
Aluminum ⁵	-	0.2	0.1 ³
Antimony	-	0.006	0.05
Arsenic	0.025 IMAC	0.05	0.05
Barium	1 MAC	1	1 - <5
Beryllium	-	-	0.0053
Boron	5 IMAC	5	-
Calcium ⁶	-	20 - 100 ³	4 - 8
Cadmium	0.005 MAC	0.005	0 - 0.0018 ⁶
Cobalt	-	-	0.05
Chromium	0.05 MAC	0.05	0.002
Copper	<1.0 AO	0.5	0 - 0.002 ⁶
Iron	<0.3 AO	0.3	0.3
Lead	0.01 ² MAC	0.05	0.003 - 0.3 ⁶
Lithium	-	-	-
Magnesium ⁸	-	100 - >700	-
Manganese	<0.05 AO	0.05	0.1 - 1.0
Mercury	0.001	0.001	0.0001
Molybdenum	-	0.25	2
Nickel	-	0.2	0.025 - 0.15 ⁴
Phosphorus	-	0.01 ⁷	-
Potassium	-	-	-
Selenium	0.01 MAC	0.01	0.001
Silicon	-	-	-
Silver	-	-	0.0001
Sodium ⁸	<200 AO	<200 AO	-
Strontium	-	-	-
Sulphur	-	-	-
Tin	-	-	-
Titanium	-	0.1	0.1
Uranium	0.1 MAC	0.1	0.3
Vanadium	-	0.1	-
Zinc	<5.0 ² AO	5	0.03

- CDWQG = Canadian Drinking Water Quality Guidelines - 6th Edition, 1996
- BCWQG = BC Environment Water Quality Guidelines - 1994
- < = Less than; > = Greater than
- ¹ Equivalent to 10mg/L as nitrate-nitrogen
- ² At the point of consumption
- ³ Food Processing - Dependent on Process
- ⁴ Where hardness is ≥ 50 mg/L as CaCO₃
- ⁵ At pH ≥ 6.5
- ⁶ Dependent on hardness
- ⁷ Lake Water Only
- ⁸ Dissolved Sodium as per BCWQG 1994 guideline



ASSAYING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ENVIRONMENTAL TESTING

10041 E. Trans Canada Hwy, R.R. #2, Kamloops, B.C. V2C 6T4
Phone (250) 573-5700 Fax (250) 573-4557
e-mail: ecotech@ma3.wkpowerlink.com

ANALYTICAL RESULTS - E1724

KALA GROUNDWATER
207-220 4TH Avenue
KAMLOOPS, BC
V2C 3N6

22-Oct-98

ATTENTION: PAUL BLACKETT

SAMPLE IDENTIFICATION: Water Sample Received: October 21, 1998
Sample Dated: October 20, 1998
Labelled: Chinook Cove, Thompson Indian Band

METHODOLOGY:

Total Coliform:

Membrane filtration 24hr. incubation at 35°C in M-Endo Broth. Results expressed in Colony Forming units/100mL water.

Fecal Coliform:

Membrane filtration 24hr. incubation at 44.5°C in MFC medium broth. Results expressed in Colony Forming units/100mL water.

PARAMETERS

Total Coliform (CFU/100mL)	1
Fecal Coliform (CFU/100mL)	1
Background Colonies (CFU/100mL)	44

KM/dm
FAX @:372-9398

Kathy Mathieu
ECO-TECH LABORATORIES LTD.
Kathy Mathieu
Environmental Lab Manager

MAIN SYSTEM

TABLE 6.2: NEQWEQWELSTEN CREEK SAMPLING RESULTS - SUMMARY

PARAMETER	CDWQ GUIDELINES		SUMMARY					
	Limit	Unit	Type	Averages	aximum	Minimum	Count	#nd
Temperature	15 °C		AO	0.3	0.5	0.0	4	0
pH	6.5 - 8.5		AO	7.9	8.1	7.7	4	0
Physical Tests								
pH	6.5 - 8.5		AO	7.9	8.2	7.6	7	0
Colour	15 YCU		AO	10.5	33.0	6.0	19	0
Hardness - total	200 mg/L		guide	53.6	80.0	35.3	12	0
Turbidity	1 NTU		MAC	0.8	8.0	0.1	19	1
Conductivity	µmhos/cm			129	150	106	6	0
Total Dissolved Solids	500 mg/L		AO	76	94	66	6	0
Dissolved Anions								
Alkalinity (CaCO ₃)	- mg/L			50	70	22	14	0
Total Metals								
Aluminum (Al) - see note 2	0.1 mg/L			0.04	0.10	0.02	5	1
Arsenic (As)	0.025 mg/L		IMAC	0.0013	0.005	0.0004	5	1
Iron (Fe)	0.3 mg/L		AO	0.014	0.015	0.010	6	6
Manganese (Mn)	0.05 mg/L		AO	0.0016	0.0050	0.0005	6	6
Dissolved Metals								
Aluminum (Al)	0.2 mg/L			0.017	0.017	0.017	1	0
Arsenic (As)	0.025 mg/L		IMAC	0.0004	0.0004	0.0004	1	0
Iron (Fe)	0.3 mg/L		AO	0.015	0.015	0.015	1	1
Manganese (Mn)	0.05 mg/L		AO	0.0005	0.0005	0.0005	1	1
Other								
Fecal Coliforms	0 /100mL		MAC	0.4	1.0	0.0	7	4
Total Coliforms	10 /100mL		MAC	5.8	33.0	0.0	7	3
Background Count				450	450	450	1	0
Standard Plate Count				12	12	12	1	0
Total Organic Carbon (TOC)	mg/L			4.3	10.5	2.2	18	0
Dissolved Organic Carbon (DOC) ⁴	mg/L			3.4	7.5	0.3	19	1
Fraction DOC/TOC:				0.8	1.0	0.1	19	0
Chlorophyll A	mg/m ³			0.10	0.20	0.04	3	1
Tannin and Lignin	mg/L			0.2	0.2	0.2	1	0
Bromide	mg/L			0.25	0.25	0.25	7	7
Sulphide	mg/L			0.063	0.063	0.063	1	0

NOTES:

- ¹ AO = Aesthetic Objectives MAC = Maximum Acceptable Concentrations
- ² A health-based guideline for aluminum in drinking water has not been established. However, operational guidance values aluminum for conventional treatment plants and less than 0.2 mg/L total aluminum for other types of systems are recommended.
- ³ In order to save on costs, the purchase of a pH meter was deferred. As a result, on-site pH readings were not obtained for
- ⁴ Dissolved Organic Carbon is greater than the Total Organic Carbon in some cases. This discrepancy is likely due to analytic
- ⁵ ASL analysis results for February 23, 2000 samples have not been finalized and should be considered preliminary.
- ⁶ Results excluded due to lab error.

TABLE 6.3: NEQWEQWELSTEN CREEK TURBIDITY RESULTS

Date	Time	Turbidity				pH	Temp (°C)	Weather (sunny, partly overcast, overcast, rainy, etc)	Flow (1 - 10 low - high)
		1	2	3	Avg				
Lab Results									
		<u>ASL</u>	<u>Caro</u>						
Jan/19/00		0.8	0.35		0.58				
Jan/26/00		0.1			0.10				
Feb/02/00		0.5			0.50				
Feb/09/00		0.5			0.50				
Feb/16/00		0.2			0.20				
Feb/23/00		0.3	0.15		0.23				
Mar/01/00		0.1			0.10				
Apr/17/00		0.2			0.20				
Jul/23/00		8			8.00				
Aug/15/00		0.4			0.40				
Aug/29/00		0.5			0.50				
Sep/14/00		1.6			1.60				
Sep/28/00		0.05			0.05				
Oct/22/00		0.5			0.50				
Nov/05/00		0.6			0.60				
Nov/19/00		0.7			0.70				
Dec/19/00		0.2			0.20				
On-Site Testing									
May/22/01	1630	16.00	14.90	16.10	15.67		28	POC, Hot	2
May/23/01	1500	12.30	12.40	15.50	13.40		29	POC, Hot	3
May/24/01	1530	7.62	8.30	9.74	8.55		24	OC, Warm	3
May/25/01	1330	4.25	3.72	4.06	4.01		26	Clear, Hot	3
May/29/01	840	2.94	3.41	2.84	3.06		10	Clear, Hot-heavy rainstorm nite before	3
May/30/01	1610	1.45	1.39	1.62	1.49		20	POC, warm	2
May/31/01	1550	1.36	1.30	1.51	1.39		28	POC& Hot	2
Jun/02/01	1200	1.22	1.32	1.48	1.34		14	POC& Warm-heavy rainstorm evening before, new turbidity meter	2
Jun/04/01	1610	0.99	0.84	0.90	0.91		22	OC, Warm	2
Jun/05/01	1615	0.82	0.90	0.95	0.89		22	OC, Warm	2
Jun/06/01	1512	0.81	0.70	0.74	0.75		20	OC, Warm	2
Jun/07/01	1530	0.78	0.69	0.67	0.71		20	POC, Warm	2
Jun/08/01	1530	0.99	1.09	0.99	1.02		16	OC, Rain, rain off & on all day	2
Jun/11/01	1400	0.79	0.57	0.67	0.68		14	OC, Rain, rain off & on all day	2
Jun/12/01	1530	0.92	0.76	0.64	0.77		20	POC, Warm	2
Jun/13/01	1700	0.69	0.53	0.67	0.63		20	POC, Warm	2
Jun/14/01	1645	0.54	0.48	0.49	0.50		19	POC, Warm	2
Jun/15/01	1535	0.53	0.65	0.46	0.55		18	OC, Warm	2
Jun/18/01	1535	0.51	0.51	0.56	0.53		22	POC, Warm	2

- Overestimate of maximum detention time in distribution system with formation potential tests; and
- Sampling location for actual DBPs underestimated/not representative of maximum detention time.

It should also be noted that there is substantial variability in the formation potential results. This may be due to sample variability and differences in laboratory protocols.

TABLE 6.5: THM AND HAA RESULTS

Test Procedure	Guideline (µg/L)	Results (µg/L)				
		01/19/00	02/23/00	04/17/00	08/29/00	12/19/00
Date (m/d/y):						
THMs	GCDWQ=100					
THMs Measured	USEPA S1=80 USEPA S2=40			nd	7.2	15.1
THMFP Standard Method		139, 320	140		173, 215	154
THMFP Modified Method, 48 hrs					75, 29, 115	45, 98, 74
THMFP Modified Method, 72 hrs					80, 105	56, 96, 73
HAAs	USEPA S1=60					
HAAs Measured	USEPA S2=50				20	24
HAA5FP Standard Method						211
HAA5FP Modified Method, 48 hrs						63
HAA5FP Modified Method, 72 hrs						80

TABLE 6.7: MAIN COMMUNITY WELL SAMPLING RESULTS - SUMMARY

PARAMETER	CDWQ GUIDELINES			SUMMARY March 26/86 to present				
	Limit	Unit	Type	Averages	Maximum	Minimum	Count	#nd
Physical Tests								
Temperature	15	° C	AO					
pH	6.5 - 8.5		AO	8.0	8.3	7.3	8	0
Colour	15	NTU	AO	5.8	18.0	1.0	9	7
Turbidity	1	NTU	MAC	0.55	1.50	0.20	9	2
Conductivity	-	(umhos/cm)		234	310	107	8	0
Hardness	200	mg/L	guide	84	101	54	8	0
Total Organic Carbon (TOC)	-	mg/L		1.4	2.3	0.3	5	1
Dissolved Organic Carbon (DOC)		mg/L		2.6	2.6	2.6	1	0
Total Dissolved Solids	500	mg/L	AO	152	205	86	7	0
Dissolved Anions								
Alkalinity, total (CaCO ₃)		mg/L		120	152	50	7	0
Nitrate Nitrogen (N)	10	mg/L	MAC	0.030	0.050	0.001	6	4
Nitrite Nitrogen (N)	1	mg/L	MAC	0.0668	0.2500	0.0005	6	6
Sulfate (SO ₄)	500	mg/L	AO	2.4	8.0	0.3	8	1
Metals - Total								
Aluminum ¹ (Al)	-	mg/L		0.0058	0.0150	0.0025	6	5
Arsenic (As)	0.025	mg/L	IMAC	0.0030	0.0100	0.0002	8	3
Iron (Fe)	0.3	mg/L	AO	0.047	0.208	0.010	8	2
Manganese (Mn)	0.05	mg/L	AO	0.0363	0.1200	0.0050	8	1
Metals - Dissolved								
Aluminum ¹ (Al)	-	mg/L ²		0.005	0.005	0.005	3	3
Arsenic (As)		mg/L		0.01	0.01	0.01	3	3
Iron (Fe)		mg/L		0.008	0.012	0.005	4	1
Manganese (Mn)		mg/L		0.0484	0.1200	0.0050	4	1
Other								
Fecal Coliforms	0	CFU/100ml	MAC	0.5	0.5	0.5	4	4
Total Coliforms	10	CFU/100ml	MAC	0.5	0.5	0.5	5	5
Background Count		CFU/100ml		90	200	8	3	0
Standard Plate Count		CFU/100ml		29	56	2	2	0
Heterotrophic Count		CFU/100ml		500	500	500	1	0
Hydrogen Sulphide (as Sulfide)	0.02	mg/L		0.020	0.040	0.009	3	1
Gross Alpha		Bq/L		0.5	0.5	0.5	1	1
Gross Beta		Bq/L		0.06	0.06	0.06	1	0
Trihalomethane Formation Potential								
Chloroform		µg/L		12.5	12.5	12.5	1	0
Bromoform		µg/L		0.5	0.5	0.5	1	1
Bromodichloromethane		µg/L		2.5	2.5	2.5	1	0
Chlorodibromomethane		µg/L		0.3	0.3	0.3	1	0
Total THMs ⁴ :	100	µg/L	IMAC	15.8	15.8	15.8	1	0

NOTES:

- ¹ Italized values are estimated at half of the detection limit
- ² Original well redrilled to lower depth in 1986 in order to improve quality and reduce solids.
- ³ For the November 3, 1999 sample, a note was made that the well ran only 5 minutes before sampling.
- ⁴ A health-based guideline for aluminum in drinking water has not been established. However, operational guidance values of less than 0.1 mg/L aluminum for conventional treatment plants and less than 0.2 mg/L total aluminum for other types of systems are recommended.
- ⁵ Total THMs/HAAs calculated as a simple sum (i.e. are not expressed as a micromolar sum relative to a particular compound).



NORWEST LABS

Control Number E 31793

Environmental Sample Information Sheet

NOTE Proper completion of this form is required in order to proceed with analysis
See reverse for your nearest Norwest location and proper sampling protocol

Address: Company: Kala Groundwater Consulting Address: 207,220-4 Avenue Kamloops, B.C., V2C 3N6		Report To: <input checked="" type="checkbox"/>	Copy of Report To: Company: Address: Same	Copy of invoice: <input checked="" type="checkbox"/> Mail invoice to this address for approval <input checked="" type="checkbox"/>
Attention: Paul Blackett Phone: (250)372-9194 Fax: (250)372-9398 Cell: e-mail: Kalpac@kamloops.net	s.19(1) Report Result: Fax <input checked="" type="checkbox"/> Mail <input checked="" type="checkbox"/> Courier <input type="checkbox"/> e-mail <input checked="" type="checkbox"/>	Attention: Phone: Fax: Cell: e-mail:		Report Result: Fax <input type="checkbox"/> Mail <input type="checkbox"/> Courier <input type="checkbox"/> e-mail <input type="checkbox"/>

Information to be included on Report and Invoice Project ID: 00319 Project Name: XXXXXX NTIB Project Location: Legal Location: PO#: 00319 Proj. Acct. Code: Agreement ID: 5812	RUSH Please contact the laboratory to confirm rush dates and times before submitting samples. Upon filling out this section, client accepts that surcharges will be attached to this analysis Required on: all analyses or as indicated <input type="checkbox"/> or <input type="checkbox"/> Date Required: _____ Signature: _____ Norwest Authorization: _____	Sample Custody (Please Print) Sampled by: SL Date Nov 22 Company KALA Signature _____ Relinquished by: Company _____ Date _____ Waybill number: Received by: Company _____ Date _____ Processed by: Norwest Labs _____ Date _____
---	--	--

Special Instructions / Comments
 Please do Gross Alpha + Beta. Hold Speciation for Alpha + Beta results.
 Trihalomethane Pot. sample in glass jar.
 In Package #3 include: Background, HPC, and Bact. ID.

Number of Containers	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Alpha + Beta	Speciation	Trihalomethane Pot.	Pack Keys	Trishom Brand									

Sample Identification	Location	Depth	Date / Time Sampled	Matrix	Sampling Method	Enter tests above (✓ relevant samples below)
1			Nov 22			11/11
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

005590

NOTE: All hazardous waste samples must be accompanied by a Material Safety Data Sheet (MSDS) and a copy of the sampling protocol.



NORTHWEST LABS

Surrey Ph (604) 514-3322 FAX (604) 514-3323
 Edmor Ph (403) 438-5522 FAX (403) 438-0396
 Cal Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: **58459**
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

Metal Analysis

	Detection Limit	Units	58459-1 TW00-01
Graphite Furnace-Dis Arsenic-Water			
Arsenic	0.003	mg/L	<0.003
Graphite Furnace-Dis Selenium-Water			
Selenium	0.002	mg/L	<0.002
Graphite Furnace-Total Arsenic-Water			
Arsenic	0.003	mg/L	<0.003
Graphite Furnace-Total Selenium-Water			
Selenium	0.002	mg/L	<0.002



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 Edmon Ph (403) 438-5522 FAX (403) 438-0396
 Calg Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

Metal Analysis

58459-1

Detection
 Limit Units TW00-01

ICP Semi-Trace Scan - Dissolved Metals in Water

	Detection Limit	Units	TW00-01
Aluminum	0.01	mg/L	<0.01
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.0346
Beryllium	0.0002	mg/L	<0.0002
Bismuth	0.02	mg/L	<0.02
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	50.5
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	<0.002
Iron	0.003	mg/L	0.007
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	37.9
Manganese	0.0005	mg/L	0.0751
Molybdenum	0.005	mg/L	0.006
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.07
Potassium	0.2	mg/L	3.9
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	9.9
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	31.1
Strontium	0.005	mg/L	0.363
Sulphur	0.1	mg/L	18.2
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	0.01
Titanium	0.001	mg/L	<0.001
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	0.002
Zinc	0.001	mg/L	0.004
Zirconium	0.001	mg/L	<0.001



NORTHWEST LABS

Surrey Ph (604) 514-3322 FAX (604) 514-3323
 Edmon' Ph (403) 438-5522 FAX (403) 438-0396
 Calg Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9286 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

Metal Analysis

58459-1

Detection Limit Units TW00-01

ICP Semi-Trace Scan - Total Metals in Water

Element	Detection Limit	Units	Result
Aluminum	0.01	mg/L	<0.01
Antimony	0.02	mg/L	<0.02
Arsenic	0.02	mg/L	<0.02
Barium	0.0005	mg/L	0.0365
Beryllium	0.0002	mg/L	<0.0002
Bismuth	0.02	mg/L	<0.02
Boron	0.01	mg/L	<0.01
Cadmium	0.0005	mg/L	<0.0005
Calcium	0.01	mg/L	52.3
Chromium	0.001	mg/L	<0.001
Cobalt	0.001	mg/L	<0.001
Copper	0.002	mg/L	0.002
Iron	0.003	mg/L	0.324
Lead	0.005	mg/L	<0.005
Lithium	0.002	mg/L	<0.002
Magnesium	0.01	mg/L	39.3
Manganese	0.0005	mg/L	0.078
Mercury	0.0001	mg/L	<0.0001
Molybdenum	0.005	mg/L	0.007
Nickel	0.002	mg/L	<0.002
Phosphorus	0.06	mg/L	0.07
Potassium	0.2	mg/L	4
Selenium	0.02	mg/L	<0.02
Silicon	0.05	mg/L	10.1
Silver	0.001	mg/L	<0.001
Sodium	0.05	mg/L	32.5
Strontium	0.005	mg/L	0.377
Sulfur	0.1	mg/L	18.9
Thorium	0.005	mg/L	<0.005
Tin	0.005	mg/L	0.01
Titanium	0.001	mg/L	<0.001
Uranium	0.06	mg/L	<0.06
Vanadium	0.002	mg/L	0.002
Zinc	0.001	mg/L	0.004
Zirconium	0.001	mg/L	<0.001

Approved By:

John Davidson, Dipl. T., C.P.H.I. (C)

Supervisor, Inorganic Lab

PAGE 3 of 6

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NORTHWEST LABS

Surrey Ph (604) 514-3322 FAX (604) 514-3323
 Edmon Ph (403) 438-5522 FAX (403) 438-0396
 Calgary Ph (403) 291-2022 FAX (403) 291-2021
 Lethbridge Ph (403) 329-9266 FAX (403) 327-8527
 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO

Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

	Detection Limit	Units	TW00-01
Alkalinity - total			
Total Alkalinity	5	mg CaCO ₃ /L	280
Chloride in Water by IEC			
Chloride	0.05	mg/L	0.54
Colour - True			
Colour	5	TCU	<5
Electrical Conductivity			
Electrical Conductivity	0.01	µS/cm	690
Fluoride in Water			
Fluoride	0.5	mg/L	<0.5
Gross Alpha			
Gross Alpha	0.22	Bq/L	<0.22
Gross Beta			
Gross Beta	0.14	Bq/L	<0.14
Hardness			
Hardness (CaCO ₃ equiv)	5	mg/L	282
Nitrogen - Nitrate in Water			
Nitrate-N	0.05	mg/L	<0.05
Nitrogen - Nitrite + Nitrate in Water			
Nitrate-N (+ Nitrite-N)	0.05	mg/L	<0.05
Nitrogen - Nitrite in Water			
Nitrite-N	0.5	mg/L	<0.5
pH in Water			
pH	0.01	pH	8.08
Solids - Dissolved			
Total Dissolved Solids	5	mg/L	428
Sulphate in Water			
Sulphate	1	mg/L	60

Water Analysis

005594

58459-1
PAGE 5 of 6



NORTHWEST LABS

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 Winnipeg Ph (204) 982-8630 FAX (204) 275-6019

Client Code: KALGRO

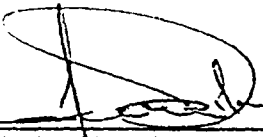
Name: KALA GROUNDWATER CONS. LTD.
 Address: #207, 220 - 4TH AVE.,

KAMLOOPS
 BC V2C 3N6
 Attn: PAUL BLACKETT
 Phone: (250) 372-9194
 Fax: (250) 372-9398

Workorder: 58459
 WO (Other): 96307
 PO Num: 319
 Project: NTIB
 Date Sampled: Nov 02, 2000
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000

	Detection		TW00-01
	Limit	Units	
Trihalomethane Formation Potential			
Chloroform	1	ug/L	25.7
Bromoform	1	ug/L	<1
Bromodichloromethane	1	ug/L	8.5
Chlorodibromomethane	1	ug/L	2.7
Turbidity			
Turbidity	0.1	NTU	2

Approved By:


 John Davidson, Dipl. T., C.P.H.I. (C)
 Supervisor, Inorganics Lab



Analytical Report

Bay 6, 2712-37 Avenue N.E.
 Calgary, AB. T1Y-5L3
 Phone: (403) 291-2022
 Fax: (403) 291-2021

Agri-Feed & Environmental Group
 Calgary Edmonton Winnipeg Lethbridge Surrey

Bill to: Kala Groundwater Consulting
 Report to: Kala Groundwater Consulting

207, 220 - 4 Avenue
 Kamloops, BC, Canada
 V2C 3N6
 Attn: Paul Blackett

Project ID: 00319
 Name: NTIB
 Location:
 LSD:
 P.O.: 00319
 Acct. Code: 58459

NWL Lot ID: 96307
 Control Number: E 31793
 Date Received: Nov 23, 2000
 Date Reported: Dec 19, 2000
 Report Number: 136422

Sampled By: SC
 Kala

Page: 1 of 2

NWL Number: 96307-1
 Sample Date: Nov 02, 2000
 Sample Description: TW00-01 58459-1

Analyte	Units	Results	Results	Results	Detection Limit
Microbiological Analysis					
Total Coliforms	Membrane Filtration	CFU/100 mL	<1		
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<1		
Heterotrophic (Standard) Plate Count - Aerobic	Membrane Filtration	CFU/100 mL	52		

Approved by: _____

John Davidson



QA/QC for WO#

58459-1

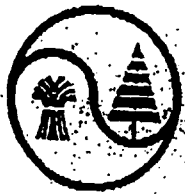
input data

Al	0	CO3	0
Ca	50.5	HCO3	280
Fe	0.007	EC	690
Mg	37.9	TDS	.428
Mn	0.0751	F	0
K	3.9	Cl	0.54
Si	9.9	NO2-N	0
Na	31.1	NO3-N	0
NH3-N	0	SO4	60

ionic balance

cation sum =	7.10		
anion sum =	6.86		
difference =	0.23	meq/L or	1.67 %
	difference (+/-)		if anion sum
acceptable =	0.2	meq/L	0 - 3
acceptable =	2	%	3 - 10
acceptable =	2.5	%	10 - 800

PASS



**NORWEST
LABS**

403 291 2021 TO 12503729398

P.02/06


Kala Groundwater Consulting
207, 220 - 4 Avenue
Kamloops, BC V2C 3N6
Fax: (250) 372-9398
Phone: (250) 372-9194

Date: 19-Dec-00
P.O #:
Order #:
Work Order #: 96307

Attn: Paul Blackett

Predominant Bacteria Identification Report

Work Order	Sample Description	CFU/100ml	Identification	Likely Habitat
96307-1 Surrey # 58459-1	TW00-01	(i) 30	(i) <i>Pseudomonas stutzeri</i>	(i) Soil and water
		(ii) 21	(i) <i>Pseudomonas alcaligenes</i>	(ii) Swimming pool water


M. Aqueel Athar, MS., PhD., MPH

Identifications performed by Epcor Water Services Inc., Edmonton, AB

005598

SRC ANALYTICAL

422 Downey Road
Saskatoon, Saskatchewan S7N 4N1
(306) 933-6932 1-800-240-8808
Fax: (306) 933-7922

Kala Groundwater Cons. Ltd
207-220 4th Avenue
Kamloops, B.C. V2C 3N6
Attn: Kristine Hagel

Date Samples Received: 22-Nov-00 Client P.O.:

Analysis has been reviewed by:



Dave Chorney
Radiochemistry and SLOWPOKE II Supervisor

- Test methods and data are validated by the laboratory's Quality Assurance Program. SRC Analytical is accredited by the Standards Council of Canada (SCC), in cooperation with the Canadian Association for Environmental Analytical Laboratories (CAEAL). Specific tests are listed in the scope of accreditation approved by the SCC.
- Routine methods follow recognized procedures from sources such as:
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
 - Environment Canada
 - US EPA
 - CANMET
- Samples will be kept for 30 working days after the final report is sent. Please contact the lab if you have any special requirements.

SRC ANALYTICAL

422 Downey Road
 Saskatoon, Saskatchewan S7N 4N1
 (306) 933-6932 1-800-240-8808

Kala Groundwater Cons. Ltd
 207-220 4th Avenue
 Kamloops, B.C. V2C 3N6
 Attn: Kristine Hagel

06-Dec-00 14:15

Date Samples Received: 22-Nov-00 Client P.O.:

SAMPLE CLIENT DESCRIPTION
 24293 WELL 1 OCT 23/00 (PREV SRC GRP 00-5080 LAB# 22464) *WATER*

ANALYTE	UNITS	24293
---------	-------	-------

RADIONUCLIDES

Polonium-210	Bq/L	<0.006
Thorium-228	Bq/L	<0.01
Thorium-230	Bq/L	0.03
Thorium-232	Bq/L	<0.01

"<": not detected at level stated above.



**North Thompson
Indian Band**

Box 220, Barriere, B.C.V0E 1E0
Ph. 672-9995 or Fax 672-5858



February 8, 2002

INAC
Funding Services BC Region
11138 Melville St
VANCOUVER, B.C. V6E 4S3

s.19(1)

Attention: Frank Gellinas, Capital Specialist

RE: [REDACTED] WELLS, ADDITIONAL WORKS

As was mentioned in our last meeting with Urban Systems, the last water quality samples collected from [REDACTED] Well were unexpectedly high for Iron, Manganese, Turbidity, Aluminum, Arsenic, and Antimony. It has been recommended to resample the well in order to determine whether treatment is required. Please see the attached February 8, 2002 letter from Urban Systems for technical verification.

We are requesting further funding in the order of \$4,000 to complete this water quality analysis at Louise Jules. As this is a health issue for the residents of the [REDACTED] Community we would appreciate your immediate response.

If you have any question pertaining to this letter or its attachments please call me at (250) 672-9995.

North Thompson Indian Band

Eddie Celesta, Band Manager

Attachments: February 8, 2002 letter from Urban Systems

North Thompson Indian Band
File: 7174708.1
February 8, 2002
Page 2

URBAN SYSTEMS.

Yours truly,

URBAN SYSTEMS LTD.



Julia Peterson, EIT

Attachments:

**January 10, 2002 Technical Memorandum
Letter dated January 22, 2002
Scope Change (USL)**

KALA GROUNDWATER CONSULTING LTD.

#3 - 3107A - 31st Avenue #207 - 220 4th Avenue.
Vernon, B.C. - V1T 2G9 Kamloops, B.C. - V2C 3N5
Tel (250) 545-1720 Tel (250) 372-9194
Fax (250) 545-1720 Fax (250) 372-9398

s.19(1)

TECHNICAL MEMORANDUM

Date: 1/10/02 Our File Ref: 00319
From: Paul Blackett A.Sc.T
To: USL Kamloops Attention: Julia Peterson, E.I.T.
PROJECT: NORTH THOMPSON BAND
WATER WELL
Re: GROUNDWATER QUALITY

Further to your fax memorandum dated January 4, 2001 regarding the above project Kala has reviewed the November 20, 2000 water sample in comparison to the December 17, 2001 sample. Table 1 summarizes elevated parameters between the two tests.

Analytical Chemistry Parameters that Exceed Criteria			
Parameter	Louise Jules Well November 20, 2000	Louise Jules Well December 17, 2001	SGCDWQ 2001
Turbidity	2	9.4	1.0 MAC
Total Iron	0.324	0.96	<0.3 AO
Total Manganese	0.078	0.102	≤0.05 AO

SGCDWQ 2001 - Summary of Guidelines for Canadian Drinking Water Quality - 2001

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration

Bold = Exceeds SGCDWQ 2001

It was noted that the ASL detection limits for aluminum, antimony and arsenic exceed the SGCDWQ criteria. The groundwater quality findings are similar with increased metals concentrations partially impacted by the higher turbidity. Kala recommends repumping this well for up to four hours and sampling for the above parameters. A water sample volume of up to 1,000 L would be processed through a conventional ion exchange softener with iron removal filter and a reverse osmosis system. Water samples would be collected pre and post treatment to determine existing water quality and determine whether water treatment at the source is viable. Consideration of bottled drinking water may be addressed. If there are questions contact the undersigned.

Prepared by:

Paul J. Blackett, A.Sc.T.

PJB/lh/00319-M00319-0110

KALA GROUNDWATER CONSULTING LTD

005603

KALA GROUNDWATER CONSULTING LTD.

#3 - 3107A - 31st Avenue
□ Vernon, B.C. - V1T 2G9
Tel (250) 545-1720
Fax (250) 545-1720

#207 - 220 4th Avenue.
□ Kamloops, B.C. - V2C 3N6
Tel (250) 372-9194
Fax (250) 372-9398
kalagroundwater@telus.net

Date: January 22, 2002
Our Ref.: P0258

Urban Systems Ltd.
200-286 St. Paul Street
Kamloops, BC
V2C 6G4

s.19(1)

Attn: Julia Peterson, E.I.T.

Re: NORTH THOMPSON INDIAN BAND - [REDACTED] WATER WELL
WATER QUALITY RETESTING

Further to our recent telephone conversation regarding the above project Kala Groundwater Consulting Ltd. (Kala) has recommended retesting of the groundwater supply well for elevated parameter concentrations cited earlier. Kala has recommended the water well be pumped until clear and retested. If the follow up testing exhibits elevated mineralization or hardness, Kala recommends undertaking a domestic groundwater treatment exercise. This process involves collecting a 100 L water sample and running the water sample through a treatment train, which may comprise any combination of the following units:

- 5-micron pre filter;
- UV unit;
- 0.3-0.6-m³ ion exchange or multi resin bed water softener, with or without iron out filter;
- Domestic and/or commercial grade reverse osmosis unit; and
- In line drip chlorinator.

The water sample is delivered to the treatment/conditioning train (TCT) via a Grundfos SQE constant pressure system pump from the sample chamber. Water samples are collected from sanitary inlet and outlet bibs for analysis of those required parameters. The feed pump provides the sample to TCT at a pressure and flow approximating field conditions. From the outlet sample results in comparison to inlet concentrations, recommendations regarding domestic level treatment and conditioning can be determined. A letter report of findings detailing the testing methodology, findings and recommendations is forwarded to the client. The cost to provide this service is in the range of \$1,200-1,600 all-inclusive.

KALA GROUNDWATER CONSULTING LTD.

005604

If there are any questions or concerns please contact our Kamloops office at (250) 372-9194.

Sincerely,
Kala Groundwater Consulting Ltd.


Per: Paul J. Blackett, AScT
Environmental Technologist

pjb/lh/0258/P0258-usl-ntib

Appendix D
Wastewater Quality Test Results

No wastewater information was seen