

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

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



**July, 2002**

# **Appendix C**

## **Water Quality Test Results**



Post-It™ Fax Note 7671E		Date <i>May 15</i>	# of pages <i>2</i>
To <i>Jackie</i>	From		
Co./Dept.	Co.		
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Fax #	Fax #		

ASSAYING  
GEOCHEMISTRY  
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RECEIVED MAY 15 20

## ANALYTICAL RESULTS - #E452

SCW'EXMX COMMUNITY HEALTH  
BOX 3090  
MERRITT, BC  
V1K 1B8

11-Apr-01

s.19(1)

**SAMPLE IDENTIFICATION:** 3 Water Samples Received: April 9, 2001  
Samples Dated: April 9, 2001  
Labelled: 1: Kwinshatin Reservoir  
2: Kwinshatin Pumphouse  
3: J [redacted] House [redacted]

**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.

<u>PARAMETERS</u>	<u>1</u>	<u>2</u>	<u>3</u>
Total Coliform (CFU/100mL)	0	0	0
Non Coliform Colonies	0	0	0
Fecal Coliform (CFU/100mL)	0	0	0

SCW'EXMX COMMUNITY HEALTH


QUALITY CONTROL - Water

11-Apr-01

Et. No. E452

<u>PARAMETERS</u>	<u>1</u>	<u>2</u>	<u>3</u>
<b>TOTAL METALS:</b>			
Aluminum	<0.006	<0.006	<0.006
Antimony	0.03	0.03	0.03
Arsenic	<0.01	<0.01	<0.01
Barium	0.08	0.07	0.08
Beryllium	<0.001	<0.001	<0.001
Bismuth	<0.01	<0.01	<0.01
Boron	0.02	0.02	0.02
Cadmium	<0.001	<0.001	<0.001
Calcium	56.8	55.8	56.5
Chromium	<0.001	<0.001	<0.001
Cobalt	<0.001	<0.001	<0.001
Copper	<0.001	<0.001	0.003
Iron	<0.008	0.018	<0.008
Lead	<0.003	<0.003	<0.003
Magnesium	11.4	11.1	11.2
Manganese	<0.005	<0.005	<0.005
Molybdenum	<0.002	<0.002	<0.002
Nickel	<0.003	<0.003	<0.003
Potassium	0.7	0.6	0.6
Selenium	<0.01	<0.01	<0.01
Silicon	2.42	2.37	2.41
Silver	<0.001	<0.001	<0.001
Sodium	7.71	7.26	7.41
Tin	<0.02	<0.02	<0.02
Titanium	<0.007	<0.007	<0.007
Uranium	<0.07	<0.07	<0.07
Vanadium	0.002	0.002	0.002
Yttrium	0.002	0.003	0.003
Zinc	0.077	0.011	0.031

NOTE: Results expressed in mg/L.



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**RESULTS OF ANALYSIS - Water**

File No. K9362

Sample ID	Kwin-shatin
Sample Date	Well
Sample Time	99 09 08
	11:00

**Physical Tests**

Colour	(CU)	<5
Conductivity	(umhos/cm)	397
Total Dissolved Solids		227
Hardness	CaCO3	190
pH		7.63
Turbidity	(NTU)	8.2

**Dissolved Anions**

Alkalinity-Total		CaCO3	204
Chloride	Cl		3.1
Fluoride	F		0.07
Sulphate	SO4		17

**Nutrients**

Nitrate Nitrogen		N	<0.1
Nitrite Nitrogen		N	<0.1
Total Phosphate		P	0.051

**Total Metals**

Aluminum	T-Al	<0.005
Arsenic	T-As	0.0004
Barium	T-Ba	0.079
Boron	T-B	<0.05
Cadmium	T-Cd	<0.0002
Calcium	T-Ca	58.0
Chromium	T-Cr	0.002
Copper	T-Cu	0.019
Iron	T-Fe	0.57
Lead	T-Pb	0.004
Magnesium	T-Mg	11.0
Manganese	T-Mn	0.013
Mercury	T-Hg	<0.00005
Potassium	T-K	0.73
Selenium	T-Se	<0.001
Sodium	T-Na	6.92
Uranium	T-U	0.00035
Zinc	T-Zn	0.033

Remarks regarding the analyses appear at the beginning of this report.  
 Results are expressed as milligrams per litre except for pH, Colour (CU),  
 Conductivity (umhos/cm), and Turbidity (NTU).  
 < = Less than the detection limit indicated.



## Appendix 1 - REGULATORY CRITERIA

File No. K9362

Health Canada

Guidelines for Canadian Drinking Water Quality, Sixth Ed., 1996.  
 All limits are Maximum Acceptable Concentration (MAC) unless  
 otherwise indicated.  
 Limits expressed as milligrams per litre except pH, Turbidity,  
 Colour, and Coliform Bacteria.

		Lower Limit	Upper Limit	Notes
<b>Physical Tests</b>				
Colour	(CU)	-	15 CU	1
Total Dissolved Solids		-	500 mg/L	1
Hardness	CaCO <sub>3</sub>	-	-	2
pH		6.5	8.5	1
Turbidity	(NTU)	-	5 NTU	3, 4
<b>Dissolved Anions</b>				
Chloride	Cl	-	250 mg/L	1
Fluoride	F	-	1.5 mg/L	
Sulphate	SO <sub>4</sub>	-	500 mg/L	1, 5
<b>Nutrients</b>				
Nitrate Nitrogen	N	-	10.0 mg/L	
Nitrite Nitrogen	N	-	1.0 mg/L	
<b>Total Metals</b>				
Arsenic	T-As	-	0.025 mg/L	6
Barium	T-Ba	-	1.0 mg/L	
Boron	T-B	-	5.0 mg/L	6
Cadmium	T-Cd	-	0.005 mg/L	
Chromium	T-Cr	-	0.05 mg/L	
Copper	T-Cu	-	1.0 mg/L	1, 3
Iron	T-Fe	-	0.3 mg/L	1
Lead	T-Pb	-	0.01 mg/L	3, 7
Manganese	T-Mn	-	0.05 mg/L	1
Mercury	T-Hg	-	0.001 mg/L	
Selenium	T-Se	-	0.01 mg/L	
Sodium	T-Na	-	200 mg/L	1
Uranium	T-U	-	0.10 mg/L	
Zinc	T-Zn	-	5.0 mg/L	1, 3

- 1 Aesthetic Objective (AO) (taste, odour, appearance, etc.)
- 2 Maximum not established, levels > 200 mg/L are considered poor but may be tolerated (AO).
- 3 At point of consumption (AO).
- 4 1 NTU maximum allowed for water entering distribution systems.
- 5 There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
- 6 Interim Maximum Acceptable Concentration (IMAC)
- 7 First drawn water may be high, flush system before sampling(MAC)

KWINSHATIN WELL  
**WATER CHEMISTRY**  
**COLDWATER INDIAN RESERVE NO. 1**  
**(OCTOBER 4, 1991)**

DRAFT

*Kwinshatin Well*

Parameters	Sample #1	F. G. Drinking Water Standards
pH (units)	7.47	6.5 - 8.5
Specific Conductivity (umhos/cm)	289	-
Colour (APHA)	<2	15
Turbidity (NTU)	<.2	5
Dissolved Solids	243	500
Suspended Solids	<1	-
Alkalinity, carbonate (as CaCO <sub>3</sub> )	<.5	-
Alkalinity, bicarbonate (as CaCO <sub>3</sub> )	218	-
Total Hardness (as CaCO <sub>3</sub> )	218	500
Chloride	4.0	250
Fluoride	0.25	1.5
Nitrate (as N)	.002	1.0
Nitrite (as N)	<.002	1.0
Total Phosphate (as P)	<.003	-
Sulfate (as SO <sub>4</sub> )	17	500
Calcium	58.1	-
Total Iron	<.01	0.3
Dissolved Iron	<.01	-
Magnesium	17.7	-
Total Manganese	<.01	0.05
Potassium	0.51	-
Sodium	5.62	20
Total Coliform (No./100 ml)	<1	10
Fecal Coliform (No./100 ml)	<1	10

NOTE: All results expressed in mg per litre unless otherwise noted.  
 < = less than

**Page(s) 004553 to\à 004554**

**Is(are) under consultation**

North CWS = Lower Kwinshatin  
 Central CWS = Kwinshatin  
 South CWS = Skugan

House #	Date	Sample Location	CWS/Well	Total Coliform	Fecal Coliform	Remarks	Comments
5	12-Dec-00		North CWS	L1	L1	Satisfactory	- Lower Kwinshatin
	12-Dec-00	Coldwater School	Central CWS	L1	L1	Satisfactory	- Kwinshatin
76	12-Dec-00		Central CWS	L1	L1	Satisfactory	
71	12-Dec-00		Central CWS	8	L1	Questionable	
105	<u>9-Nov-00</u>		<u>Central CWS</u>	<u>0B</u>	<u>L1</u>	<u>Not Acceptable</u>	
303	7-Nov-00		Central CWS	L1	L1	Satisfactory	
16	7-Nov-00		North CWS	L1	L1	Satisfactory	
48	24-Oct-00		Central CWS	L1	L1	Satisfactory	
89	24-Oct-00		South CWS	L1	L1	Satisfactory	- Skugan
35	24-Oct-00		Central CWS	L1	L1	Satisfactory	
s.19(1) 60	<u>24-Oct-00</u>		<u>Central CWS</u>	<u>Est 150</u>	<u>13</u>	<u>Not Acceptable</u>	
30	23-Oct-00		Central CWS	L1	L1	Satisfactory	
210	12-Sep-00		Private Well	L1	L1	Satisfactory	
	12-Sep-00	Coldwater School	Central CWS	L1	L1	Satisfactory	
50	12-Sep-00		Central CWS	L1	L1	Satisfactory	
302	12-Sep-00	Community Hall	North CWS	L1	L1	Satisfactory	
48	<u>12-Sep-00</u>		<u>Central CWS</u>	<u>Est 2</u>	<u>Est</u>	<u>Not Acceptable</u>	
33	15-Aug-00		Central CWS	L1	L1	Satisfactory	
30	15-Aug-00		Central CWS	11	11	Satisfactory	
87	15-Aug-00		South CWS	L1	L1	Satisfactory	
3B	15-Aug-00		Private Well	L1	L1	Satisfactory	
101	15-Aug-00		Private Well	L1	L1	Satisfactory	
25A	20-Jul-00		North CWS	L1	L1	Satisfactory	
303	20-Jul-00		Central CWS	L1	L1	Satisfactory	
32	20-Jul-00		Central CWS	L1	L1	Satisfactory	

private = individual wells.

	Date	Sample Location	CWS/Well	Total Coliform	Fecal Coliform	Remarks	Comments
31	20-Jul-00		Central CWS	L1	L1	Satisfactory	Kitchen
31	<b>20-Jul-00</b>		<b>Central CWS</b>	<b>Est 4. 530</b>	<b>2</b>	<b>Not Acceptable</b>	<b>Preliminary Report Bathroom</b>
5	18-Jul-00		North CWS	L1	L1	Satisfactory	
8	18-Jul-00		Private Well	6	L1	Acceptable	
7	18-Jul-00		Private Well	2	L1	Acceptable	
31	<b>11-Jul-00</b>		<b>Central CWS</b>	<b>L1</b>	<b>L1</b>	<b>Questionable</b>	<b>L1 Coliform high Colony Back Ground</b>
302	11-Jul-00	Coldwater Hall	North CWS	L1	L1	Satisfactory	
6	11-Jul-00		Private Well	L1	L1	See Notes	High Colony Background Count 200/100ml
	20-Jun-00		Private Well	L1	L1	Satisfactory	
s.19(1)	20-Jun-00		Private Well	L1	L1	Satisfactory	
	20-Jun-00		Private Well	2	L1	Satisfactory	
6	13-Jun-00		Private Well	65	L1	Not Acceptable	
7	30-May-00		Private Well	L1	L1	Satisfactory	
9	30-May-00		Private Well	L1	L1	Satisfactory	
	30-May-00	Band Office	City Of Merritt CWS	L1	L1	Satisfactory	
6	30-May-00		Private Well	Est 68	L1	Not Acceptable	
85	29-May-00		South CWS	L1	L1	Satisfactory	
	29-May-00	Coldwater School	Central CWS	L1	L1	Satisfactory	
89	29-May-00		South CWS	L1	11	Satisfactory	
68	29-May-00		Central CWS	L1	L1	Satisfactory	
6	12-Feb-00		Private	39	L1	Not Acceptable	Disinfection Rec, boil Water
66	24-Feb-00		Central CWS	L1	L1	Satisfactory	
24	24-Feb-00		North CWS	L1	L1	Satisfactory	
23	24-Feb-00		North CWS	L1	L1	Satisfactory	
	21-Feb-00		Private	L1	L1	Questionable	More than 200/100 Colonies

18-Jan-00	Access Center	Central CWS	L1	L1	Satisfactory
18-Jan-00	Coldwater School	Central CWS	L1	L1	Satisfactory
18-Jan-00	Community Hall	North CWS	L1	L1	Satisfactory

Date	Sample Location	CWS/Well	Total Coliform	Fecal Coliform	Remarks	Comments
9-Nov-99		Private	L1	L1	Satisfactory	
9-Nov-99		Central CWS	L1	L1	Satisfactory	
9-Nov-99		Central CWS	L1	L1	Satisfactory	
2-Nov-99		Private	L1	L1	Satisfactory	
2-Nov-99		Private	L1	L1	Satisfactory	
12-Oct-99		Private	L1	L1	Satisfactory	
12-Oct-99		Private	L1	L1	Satisfactory	
12-Oct-99	Community Hall	North CWS	L1	L1	Satisfactory	
12-Oct-99		Private	27	L1	Not Acceptable	All Wells Require Maintenance
12-Oct-99		Private	EST 1	L1	Not Acceptable	Boil Water ASAP till Further Notice
12-Oct-99		Private	EST 1	L1	Questionable	Col Density stops Coliform Count
13-Sep-99	Coldwater School	Central CWS	L1	L1	Satisfactory	
13-Sep-99		Private	L1	L1	Satisfactory	
13-Sep-99		Private	L1	L1	Satisfactory	
17-Aug-99		North CWS	L1	L1	Satisfactory	
17-Aug-99		Central CWS	L1	L1	Satisfactory	
17-Aug-99		Central CWS	L1	L1	Satisfactory	
13-Jul-99		North CWS	L1	L1	Satisfactory	
13-Jul-99		Central CWS	L1	L1	Satisfactory	
13-Jul-99		North CWS	L1	L1	Satisfactory	
14-Jun-99		Private	2	L1	Satisfactory	
14-Jun-99		North CWS	L1	L1	Good	

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14-Jun-99		South CWS	L1	L1	Good	
10-May-99	V	Private	L1	L1	Satisfactory	
10-May-99		Private	L1	L1	Satisfactory	
<b>10-May-99</b>		<b>Private</b>	<b>L1</b>	<b>L1</b>	<b>Not Acceptable</b>	<b>Boil Water</b>
10-May-99		Meadows CWS	L1	L1	Satisfactory	

Date	Sample Location	CWS/Well	Total Coliform	Fecal Coliform	Remarks	Comments
10-May-99		Meadows CWS	L1	L1	Satisfactory	
10-May-99		Private	3	L1	Satisfactory	
<b>12-Apr-99</b>		<b>Private</b>	<b>EST 1</b>	<b>L1</b>	<b>Questionable</b>	<b>High Colony stops counting</b>
12-Apr-99		Central CWS	L1	L1	Satisfactory	
12-Apr-99		North CWS	L1	L1	Satisfactory	
23-Mar-99		South CWS	L1	L1	Satisfactory	
23-Mar-99		Central CWS	L1	L1	Satisfactory	
23-Mar-99		Central CWS	L1	L1	Satisfactory	
23-Mar-99	Coldwater School	Central CWS	L1	L1	Satisfactory	
15-Feb-99		South CWS	L1	L1	Satisfactory	
15-Feb-99		Central CWS	L1	L1	Satisfactory	
15-Feb-99		North CWS	L1	L1	Satisfactory	
15-Feb-99		North CWS	L1	L1	Satisfactory	
15-Feb-99		North CWS	L1	L1	Satisfactory	
19-Jan-99		Private	L1	L1	Satisfactory	
19-Jan-99		South CWS	L1	L1	Satisfactory	
19-Jan-99	Coldwater School	Central CWS	L1	L1	Satisfactory	
11-Aug-98		Private	est 2	L1	Marginal	estimated Count
11-Aug-98		Private	O.G. 2	L1	Questionable	Over Growth of Coliform
18-Feb-98		Private	Est 5	L1	Acceptable	High count preventing accurate coliform count

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20-Oct-98		Private	Est 6 to 10	L1	Not Acceptable	Disinfection Recommended, boil Water
29-Oct-98		North CWS	59	L1	Not Acceptable	Disinfection, boil Water Meat & Clothing
8-Sep-98		Private	Est 30	14	Not Acceptable	Disinfection ongoing Baises
8-Sep-98		Private	Est 90	L1	Not Acceptable	Disinfection
8-Aug-97		Private	OG	L1	Re Sample	Disinfect
17-Jun-97		South CWS	Est 80	L1	Not Acceptable	Disinfect
17-Jun-97		South CWS	Est 160	L1	Not Acceptable	Disinfect

Date	Sample Location	CWS/Well	Total Coliform	Fecal Coliform	Remarks	Comments
28-Apr-97	Community Hall	North CWS	L1.1	L1,1	Not Acceptable	
28-Jan-97		Private	Est 11	L1	Marginal	Resample
14-Apr-97	Community Hall	North CWS	OG	L1	Not Acceptable	
22-Oct-96		Central CWS	Est 450	Est 20	Not Acceptable	
29-May-95		Private	Est 16	L1	Questionable	Resample
21-Sep-94		North CWS	Est 19	L1	Unsatisfactory	
20-Sep-94		Central CWS	Est 2	L1	Marginal	

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# **Appendix D**

## **Wastewater Quality Test Results**

No wastewater information was seen