

Interpreting Water Quality Reports

North Island Labs

Catherine Black

October 30 2014

The Full Chemical Test



We don't have one of these

Guidelines for Canadian Drinking Water Quality
approx \$3500/sample



What do you really need to do?



“VIHA” list



Lab Packages

Where does the “VIHA” list come from
?

**GUIDELINES FOR THE APPROVAL OF
WATER SUPPLY SYSTEMS**

Vancouver Island Health Authority

www.viha.ca/NR/rdonlyres/BA469B79-2A46-4215-8E8F-515619A16DAC/0/GUIDELINESFORTHEAPPROVALOFWATERWORKS.pdf

MINIMUM UNTREATED WATER SOURCE QUALITY PARAMETERS TO BE ANALYZED

SOURCE TYPE: SHALLOW WELLS, DEEP WELLS, and SPRINGS

MICROBIOLOGICAL(1)

Total Coliform	<i>Escherichia coli</i>
Non-coliform bacteria	Iron and Sulphur Bacteria (deep wells)
Heterotrophic Plate Counts	

PHYSICAL/CHEMICAL

Alkalinity	Nitrate
Ammonia	Nitrite
Arsenic	Organic Nitrogen
Chloride	pH
Colour	Selenium
Conductivity (2)	Sulphate
Corrosiveness (3)	Sulphide (as hydrogen sulphide) (5)
Fluoride	Total Dissolved Solids
Hardness	Total Organic Carbon (6) (7)
Metals Scan (4)	Turbidity

Notes:

1. Bacterial analysis must be conducted at an approved laboratory (see attached list).
 2. Conductance/Specific Conductance.
 3. Calcium Carbonate saturation/Langelier's index.
 4. At least: aluminum, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorous, potassium, silver, sodium, zinc (expand if mineralized to include mercury).
 5. For deep wells: On site or preserve sample, or use alternative method of confirming that water has satisfactory odour.
 6. If Turbidity less than 1.0 mg/L Dissolved Organic Carbon may be used as an alternative to Total Organic Carbon.
 7. If Total Organic Carbon greater than 2.5 mg/L analyze for Tannins and Lignin and perform a trihalomethane formation potential test (if chlorine is being used as the method of disinfection).
-
1. Analysis of additional parameters may be required based on the results of initial analysis and on potential impact by nearby sources of contamination or polluting sources. If industrial, agricultural or pesticide pollution is suspected, identify what chemicals may have been used and analyse for most likely indicator parameters. If petroleum pollution is suspected (underground fuel storage) analyse for alkyl benzene compounds. If parasitic pollution suspected, *Giardia lamblia* and/or *cryptosporidium* analysis may be required.
 2. Analyses must be sufficiently accurate so that the minimum detectable concentration is less than 10% of Guidelines for Canadian Drinking Water Quality, the **Drinking Water Protection Act** or the **Drinking Water Protection Regulation** where applicable. Other analysis must provide sufficient information to reasonably assess the water suitability for drinking purposes and to determine what, if any, treatment might be needed. Analyses must be conducted in accordance with methods prescribed in "Standard Methods for the Examination of Water and Wastewater" (latest edition) or other acceptable procedure.

server:

Certificate of Analysis

Report To: North Island Labs
Catherine

Lab Number: 115227
Date Reported: 27 Oct 14
Date Completed: 27 Oct 14
Date Received: 20 Oct 14 15:51

115227-01 New Drinking Water Source Deep Well RDN

Sampled By: RDN Staff
Sampling Date: 20 Oct 14 9:00

Test	Result	Units	Drinking Water Guidelines
Iron Bacteria	absent	cfu/mL	
Sulphur Bacteria	absent	cfu/mL	
Total Coliforms (DES)	2.0	MPN/100mL	<1
E. coli (DES)	<1.0	MPN/100mL	<1
Total Plate Count	350	CFU/ml	

115227-01

Test	Method	Analyst	Date
E. coli (DES)	Enzyme Substrate, APHA 9223 B -modified	NiSL	10/20/2014
Iron Bacteria	Subcontracted Test	NiSL	10/21/2014
Sulphur Bacteria	Subcontracted Test	MBL	10/21/2014
Total Coliforms (DES)	Enzyme Substrate, APHA 9223 B -modified	NiSL	10/20/2014
Total Plate Count	Membrane Filtration, APHA 9215 D -modified	NiSL	10/20/2014

Approved By: *Catherine Black*
Catherine Black, Owner/Operator

Certificate of Analysis

Report To: North Island Labs
Catherine

Lab Number: 115241
Date Reported: 28 Oct 14
Date Completed: 28 Oct 14
Date Received: 21 Oct 14 10:59

115241-01 New Drinking Water Source Deep Well RDN

Sampled By: RDN Staff
Sampling Date: 20 Oct 14 10:00

Test	Result	Units	Drinking Water Guidelines
Alkalinity	200	mg/L (CaCO ₃)	
Conductivity	450	uS/cm	
Hardness (CaCO ₃)	80	mg/L	80-100
Corrosivity	-0.65		
pH at 25 C	7.0	pH Units	6.5-8.5
Total Dissolved Solids	300	mg/L	500 AO

115241-01

Test	Method	Analyst	Date
Alkalinity	Titration to 4.5, APHA 2320 B -modified	NI&L	10/21/2014
Conductivity	Conductivity @25C, APHA 2510 B -modified	NI&L	10/21/2014
Corrosivity	Langelier Saturation Index, www.awwa.org	NI&L	
Hardness (CaCO ₃)	Exova Sub contract, APHA 2340 B -modified	EXL	10/22/2014
pH at 25 C	Electrometric, APHA 4500 B -modified	NI&L	10/21/2014
Total Dissolved Solids	Exova Sub contract, dried @180C, APHA 2540C-modified	EXL	10/21/2014

Att N

Certificate of Analysis

Report To: North Island Labs
Catherine

Lab Number: 115244
Date Reported: 4 Nov 14
Date Completed: 27 Oct 14
Date Received: 21 Oct 14 11:29

115244-01 New Drinking Water Source Deep Well RDN

Sampled By: RDN Staff
Sampling Date: 21 Oct 14 10:00

Test	Result	Units	Drinking Water Guidelines
Total ammonia - N	1.00	mg/L	
Chloride	100.0	mg/L	250 AO
Fluoride	1.60	mg/L	1.5 MAC
Nitrate (N)	8.00	mg/L	10 MAC
Nitrite (N)	0.80	mg/L	1 MAC
Sulphate	20.0	mg/L	500 AO
Total Organic Nitrogen	10.00	mg/L	

115244-01

Test	Method	Analyst	Date
Chloride	Ion Chromatography, EPA 300.1 -modified	NLsL	10/27/2014
Fluoride	Ion Chromatography, EPA 300.1 -modified	NLsL	10/27/2014
Nitrate (N)	Ion Chromatography, EPA 300.1 -modified	NLsL	10/27/2014
Nitrite (N)	Ion Chromatography, EPA 300.1 -modified	NLsL	10/27/2014
Sulphate	Ion Chromatography, EPA 300.1 -modified	NLsL	10/27/2014
Total ammonia - N	Hach 10205, Salicylate -modified	NLsL	10/27/2014

Certificate of Analysis

Report To: North Island Labs
Catherine

Lab Number: 115393
Date Reported: 7 Jan 14
Date Completed: 7 Nov 14
Date Received: 27 Oct 14 14:07

115393-01 New Drinking Water Source Deep Well RDN

Sampled By: RDN Staff
Sampling Date: 20 Oct 14 8:36

Test	Result	Units	Drinking Water Guidelines
Colour - Apparent	20	Colour Units	15
Colour - True	10	Colour Units	15
Sulphide	1.00	mg/L	0.05 AO
Tannins & Lignins	1.4	mg/L	0.4 AO
Bromodichloromethane potential	see attached	mg/L	
Bromoform potential	see attached	mg/L	
Chloroform potential	see attached	mg/L	
Dibromochloromethane potential	see attached	mg/L	
Total Trihalomethanes potential	see attached	mg/L	
Total Organic Carbon	4.2	mg/L	
Bromodichloromethane	0.030	mg/L	0.016 MAC
Bromoform	0.050	mg/L	
Chloroform	0.200	mg/L	
Dibromochloromethane	0.050	mg/L	
Total Trihalomethanes	0.330	mg/L	0.100 MAC

Test	Result	Units	Drinking Water Guidelines
T-Aluminium	0.015	mg/L	0.1 Operational Std
T-Antimony	<0.0001	mg/L	0.006 MAC
T-Arsenic	0.015	mg/L	0.010 MAC
T-Barium	0.00475	mg/L	1.0 MAC
T-Beryllium	<0.00005	mg/L	
T-Boron	7.2	mg/L	5 MAC
T-Bismuth	0.116	mg/L	
T-Cadmium	<0.00001	mg/L	0.005 MAC
T-Calcium	24.0	mg/L	
T-Chromium	<0.0005	mg/L	0.05 MAC
T-Cobalt	<0.0001	mg/L	
T-Copper	0.0051	mg/L	1.0 AO
T-Iron	0.358	mg/L	0.3 AO
T-Lead	0.0002	mg/L	0.010 MAC
T-Lithium	<0.0005	mg/L	
T-Magnesium	5.0	mg/L	
T-Manganese	0.07	mg/L	0.05 AO
T-Molybdenum	0.00056	mg/L	
T-Nickel	0.0003	mg/L	
T-Potassium	1.9	mg/L	
T-Selenium	<0.0001	mg/L	0.01 MAC
T-Silicon	10.1	mg/L	
T-Silver	<0.00005	mg/L	
T-Sodium	30.5	mg/L	200 AO
T-Strontium	0.0953	mg/L	
T-Thallium	<0.00001	mg/L	

Questions ?



Health Canada

www.hc-sc.gc.ca

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Canadian Drinking Water Guidelines

The [Guidelines for Canadian Drinking Water Quality](#) and the [Guideline Technical Documents](#) (formerly known as Guideline Supporting Documents) are developed by the [Federal-Provincial-Territorial Committee on Drinking Water](#) and have been published by Health Canada since 1968.

Canadian drinking water supplies are generally of excellent quality. However, water in nature is never "pure." It picks up bits and pieces of everything it comes into contact with, including minerals, silt, vegetation, fertilizers, and agricultural run-off. While most of these substances are harmless, some may pose a health risk. To address this risk, Health Canada works with the provincial and territorial governments to develop guidelines that set out the maximum acceptable concentrations of these substances in drinking water. These drinking water guidelines are designed to protect the health of the most vulnerable members of society, such as children and the elderly. The guidelines set out the basic parameters that every water system should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible.

It's Your Health

- [Arsenic in Drinking Water](#)
- [Drinking Water Chlorination](#)
- [Effects of Lead on Human Health](#)
- [Fluorides and Human Health](#)

Water Talk

- [Blue-Green Algae \(Cyanobacteria\) and their toxins](#)
- [Boil Water Advisories and Boil Water Orders](#)
- [Drinking Water Away from Home](#)
- [Drinking Water In The Great Canadian Outdoors](#)
- [Giardia and Cryptosporidium in Drinking Water](#)
- [Perchlorate and Human Health](#)

Google "Canadian Drinking Water Guidelines"

- The first link "Guidelines for Drinking Water Quality" takes you to the Summary table
- Technical documents

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Guidance Documents

- [Guidance on Controlling Corrosion in Drinking Water Distribution Systems](#)
- [Guidance on Chloral Hydrate in Drinking Water](#)
- [Guidance for Issuing and Rescinding Boil Water Advisories](#)
- [Guidance for Issuing and Rescinding Drinking Water Avoidance Advisories in Emergency Situations](#)
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Guidelines and Technical Documents

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Guidelines

Microbiological Parameters:

- [Introduction](#)
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Bacteriological Quality

- [Escherichia coli](#)
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Chemical/Physical Parameters:

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- [Bromodichloromethane \(see Trihalomethanes\)](#)
- [Bromoform \(see Trihalomethanes\)](#)
- [Bromoxynil](#)

Guideline Technical Documents

- For keepers – each links to a 30 page pdf
- These are very useful to have on hand, especially when something is in the news. Download the popular pdf's and keep them handy for emailing to customers with specific concerns.

VIHA POTABILITY WITH MICRO (WATER)

Maxxam ID					CJ1505		
Sampling Date					2011/12/14 11:50		
	Units	Criteria A	Criteria B	Criteria C	VALLEY VIEW WELL 13088	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L				40.9	3.0	5473500
Total Antimony (Sb)	ug/L	6			<0.50	0.50	5473500
Total Arsenic (As)	ug/L	10			1.70	0.10	5473500
Total Barium (Ba)	ug/L	1000			2.9	1.0	5473500
Total Beryllium (Be)	ug/L				<0.10	0.10	5473500
Total Bismuth (Bi)	ug/L				<1.0	1.0	5473500
Total Boron (B)	ug/L	5000			<50	50	5473500
Total Cadmium (Cd)	ug/L	5			<0.010	0.010	5473500
Total Chromium (Cr)	ug/L	50			2.8	1.0	5473500
Total Cobalt (Co)	ug/L				<0.50	0.50	5473500
Total Copper (Cu)	ug/L				17.8	0.20	5473500
Total Iron (Fe)	ug/L				82.1	5.0	5473500
Total Lead (Pb)	ug/L	10			0.70	0.20	5473500
Total Manganese (Mn)	ug/L				8.8	1.0	5473500
Total Mercury (Hg)	ug/L	1			<0.050	0.050	5473500
Total Molybdenum (Mo)	ug/L				<1.0	1.0	5473500
Total Nickel (Ni)	ug/L				<1.0	1.0	5473500
Total Phosphorus (P)	ug/L				39	10	5473500
Total Selenium (Se)	ug/L	10			0.20	0.10	5473500
Total Silicon (Si)	ug/L				9870	100	5473500
Total Silver (Ag)	ug/L				<0.020	0.020	5473500
Total Strontium (Sr)	ug/L				47.5	1.0	5473500
Total Thallium (Tl)	ug/L				<0.050	0.050	5473500
Total Tin (Sn)	ug/L				<5.0	5.0	5473500
Total Titanium (Ti)	ug/L				<5.0	5.0	5473500
Total Uranium (U)	ug/L	20			<0.10	0.10	5473500
Total Vanadium (V)	ug/L				7.5	5.0	5473500
Total Zinc (Zn)	ug/L				9.7	5.0	5473500
Total Zirconium (Zr)	ug/L				<0.50	0.50	5473500
Total Calcium (Ca)	mg/L				15.5	0.050	5452223
Total Magnesium (Mg)	mg/L				7.16	0.050	5452223
Total Potassium (K)	mg/L				0.674	0.050	5452223
Total Sodium (Na)	mg/L				5.01	0.050	5452223
Total Sulphur (S)	mg/L				<3.0	3.0	5452223

Units

mg/L (milligrams per litre)
 Is the same as ppm (parts per million)

ug/L (micrograms per litre) is
 the same as ppb (parts per billion)

There are 1000 ug in a mg.
 Keep this in mind when
 looking at the CDWQC.
 Example: Boron

RDL = Reportable Detection Limit

Criteria A, Criteria B, Criteria C: CDWQG Potability (Health Criteria at Point of Use / Distribution) - for Victoria requirement for <1 micro RDLs

VIHA POTABILITY WITH MICRO (WATER)

Maxxam ID	Sampling Date	Units	Criteria A	Criteria B	Criteria C	C11585 2011/12/14 11:50 VALLEY VIEW WELL 13088	RDL	QC Batch
Microbiological Param.								
E. coli	MPN/100mL	0				<1	1	5456229
Heterotrophic Plate Count	CFU/mL					3	1	5453001
Total Coliforms	MPN/100mL	0				<1	1	5456229
Parameter								
Iron Bacteria	CFU/mL					<30	30	5472494
Sulphate reducing bacteria	CFU/mL					0	0	5472543
Langelier Index (@ 4.4C)	N/A					-1.01	N/A	5452227
Langelier Index (@ 60C)	N/A					0.0340	N/A	5452228
Saturation pH (@ 4.4C)	N/A					8.89	N/A	5452227
Saturation pH (@ 60C)	N/A					7.85	N/A	5452228

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	
5447866	Conductivity	2011/12/14		88	86 - 104			1, RDL=1	uS/cm	1.6	20
5447868	Alkalinity (Total as CaCO3)	2011/12/14		99	80 - 120			<0.5	mg/L	0.7	20
5447868	Bicarbonate (HCO3)	2011/12/14						<0.5	mg/L	2.1	20
5447868	Carbonate (CO3)	2011/12/14						<0.5	mg/L	NC	20
5447868	Hydroxide (OH)	2011/12/14						<0.5	mg/L	NC	20
5453001	Heterotrophic Plate Count	2011/12/14								NC	N/A
5454233	Nitrite (N)	2011/12/15	103	79 - 115	103	80 - 122		<0.002	mg/L	NC	20
5454230	Nitrate plus Nitrite (N)	2011/12/15	93	80 - 120	99	80 - 120		<0.002	mg/L	0.8	20
5456089	Total Dissolved Solids	2011/12/16			112	80 - 120		14, RDL=10	mg/L	NC	20
5456229	E. coli	2011/12/15								NC	50
5456229	Total Coliforms	2011/12/15								NC	45
5460868	Sulphide	2011/12/19	94	80 - 120	97	80 - 120	0.0056, RDL=0.0050		mg/L	NC	20
5461337	Turbidity	2011/12/19			96	80 - 120		<1	NTU	6.9	20
5461339	True Colour	2011/12/19			100	94 - 106		<5	Col. Unit	NC	10
5462912	Ammonia (N)	2011/12/19	106	80 - 120	97	80 - 120	0.0060, RDL=0.0050		mg/L	NC	20
5464440	Dissolved Sulphate (SO4)	2011/12/19	NC	80 - 120	95	80 - 120		<0.50	mg/L	7.1	20
5464445	Total Nitrogen (N)	2011/12/19	NC	80 - 120	96	80 - 120		<0.020	mg/L	0.3	20
5467888	Total Organic Carbon (C)	2011/12/20	98	80 - 120	100	80 - 120		<0.50	mg/L	6.7	20
5467706	Dissolved Chloride (Cl)	2011/12/20	105	80 - 120	106	80 - 120		<0.5	mg/L	1.4	20
5473500	Total Antimony (Sb)	2011/12/23	112	80 - 120	106	80 - 120		<0.50	ug/L	NC	20
5473500	Total Arsenic (As)	2011/12/23	100	80 - 120	99	80 - 120		<0.10	ug/L	2.3	20
5473500	Total Barium (Ba)	2011/12/23	104	80 - 120	104	80 - 120		<1.0	ug/L	NC	20
5473500	Total Beryllium (Be)	2011/12/23	102	80 - 120	100	80 - 120		<0.10	ug/L	NC	20
5473500	Total Bismuth (Bi)	2011/12/23	99	80 - 120	103	80 - 120		<1.0	ug/L	NC	20
5473500	Total Cadmium (Cd)	2011/12/23	105	80 - 120	103	80 - 120		<0.010	ug/L	NC	20
5473500	Total Chromium (Cr)	2011/12/23	103	80 - 120	103	80 - 120		<1.0	ug/L	NC	20
5473500	Total Cobalt (Co)	2011/12/23	98	80 - 120	98	80 - 120		<0.50	ug/L	NC	20
5473500	Total Copper (Cu)	2011/12/23	NC	80 - 120	101	80 - 120		<0.20	ug/L	0.04	20
5473500	Total Iron (Fe)	2011/12/23	NC	80 - 120	108	80 - 120		<5.0	ug/L	11.2	20
5473500	Total Lead (Pb)	2011/12/23	101	80 - 120	102	80 - 120		<0.20	ug/L	NC	20
5473500	Total Manganese (Mn)	2011/12/23	NC	80 - 120	99	80 - 120		<1.0	ug/L	0.1	20
5473500	Total Mercury (Hg)	2011/12/23	112	80 - 120	108	80 - 120		<0.050	ug/L	NC	20
5473500	Total Molybdenum (Mo)	2011/12/23	105	80 - 120	108	80 - 120		<1.0	ug/L	NC	20
5473500	Total Nickel (Ni)	2011/12/23	99	80 - 120	99	80 - 120		<1.0	ug/L	NC	20
5473500	Total Selenium (Se)	2011/12/23	104	80 - 120	105	80 - 120		<0.10	ug/L	NC	20
5473500	Total Silver (Ag)	2011/12/23	110	80 - 120	111	80 - 120		<0.020	ug/L	NC	20
5473500	Total Strontium (Sr)	2011/12/23	NC	80 - 120	103	80 - 120		<1.0	ug/L	1.3	20
5473500	Total Thallium (Tl)	2011/12/23	103	80 - 120	102	80 - 120		<0.050	ug/L	NC	20
5473500	Total Tin (Sn)	2011/12/23	105	80 - 120	104	80 - 120		<5.0	ug/L	NC	20
5473500	Total Titanium (Ti)	2011/12/23	104	80 - 120	106	80 - 120		<5.0	ug/L	NC	20

The last pages of the report are the lab's quality control data and signature page and a scan of the requisition form.

Certificate of Analysis

Report To: Catherine Black

Lab Number: 95300
 Date Reported: 1 Jun 12
 Date Completed: 1 Jun 12
 Date Received: 16 May 12 15:43

95300-01 Raw - Upper Dam
 Sampled By: Matt
 Sampling Date: 16 May 12 8:30

Test	Result	Units	Drinking Water Guideline
Alkalinity	26	mg/L (CaCO ₃)	
Total Ammonia (N)	<0.05	mg/L	
Chloride	1.7	mg/L	250 AO
Fluoride	<0.05	mg/L	1.5 MAC
Nitrate (N)	<0.1	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	2.2	mg/L	500 AO
Colour - Apparent	27	Colour Units	15
pH	7.6	pH Units	6.5-8.5
Conductivity	57.8	uS/cm	
Iron Bacteria	None Detected	cfu/mL	
Sulphur Bacteria	None Detected	cfu/mL	
Corrosivity	-1.73		
Total Coliforms (MF)	1730	CFU/100mL	<1
E. coli (MF)	3	CFU/100mL	<1
Non-Coliform Background	<10	CFU/100mL	
Total Dissolved Solids	22	mg/L	500 AO
Total Organic Carbon	3.1	mg/L	
Total Organic Nitrogen	0.2	mg/L	
Total Plate Count	100	CFU/ml	
T-Aluminium	0.032	mg/L	0.1 Operational Std
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	<0.0002	mg/L	0.010 MAC
T-Barium	0.002	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Boron	0.006	mg/L	5 MAC
T-Bismuth	<0.001	mg/L	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC
 > = Greater than; < = Less than
 Results relate only to samples as submitted. This certificate must not be reproduced,
 except in its entirety, without written consent from the laboratory.
 Canadian Drinking Water Guidelines as listed on Dec. 5th, 2005 and are subject to

9/10/2012 18:06
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95300-01 Raw - Upper Dam
 Sampled By: Matt
 Sampling Date: 16 May 12 8:30

Test	Result	Units	Drinking Water Guideline
T-Cadmium	0.00002	mg/L	0.005 MAC
T-Calcium	7.07	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	0.00005	mg/L	
T-Copper	0.002	mg/L	1.0 AO
T-Iron	0.045	mg/L	0.3 AO
T-Lead	0.0003	mg/L	0.010 MAC
T-Lithium	0.002	mg/L	
T-Magnesium	1.49	mg/L	
T-Manganese	<0.005	mg/L	0.05 AO
T-Molybdenum	0.0041	mg/L	
T-Nickel	<0.001	mg/L	
T-Phosphorus	<0.01	mg/L	
T-Potassium	0.3	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	4.41	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	3.24	mg/L	200 AO
T-Strontium	0.022	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	0.0003	mg/L	
T-Titanium	0.003	mg/L	
T-Uranium	<0.0004	mg/L	
T-Vanadium	0.0005	mg/L	
T-Zinc	0.006	mg/L	5.0 AO
Hardness (CaCO ₃)	24	mg/L	80-100
Turbidity	0.9	NTU's	5 AO
UV Transmittance	77.1	%/cm	

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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553



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95300-01

This water sample, at the time it was taken, does not meet the Canadian Drinking Water Guidelines for one or more of the parameters tested. Please refer to your results.

This analysis is not to be interpreted as a Water Potability Certificate as this is beyond the authority of North Island Laboratories Ltd.

Total Coliform: The Total Coliform group (of micro-organisms) includes: The fecal coliform & E.coli, which are common to the intestinal tract of both man and animals, and the non-fecal coliforms that are naturally present in soils and on vegetation.

BC Health Act Microbiological Standard:

1. For a waterworks system to meet the microbiological standard, sample tests must meet the following criteria:

a) E. coli ... <1 E.coli/100ml

b) Total Coliform:

i) one sample within a 30 day period ... < 1 total coliform / 100 ml

ii) more than one sample in a consecutive 30 day period ... 90% or more of the samples must have < 1 total coliform/100 ml and no sample must have more than 10 total coliform / 100 ml

Test	Method	Analyst	Date
Alkalinity	Titration to 4.5, APHA 2320 B -modified	NiL	5/17/2012
Chloride	Ion Chromatography, EPA 300.1 -modified	NiL	5/17/2012
Colour - Apparent	Spectrophotometer, APHA 2120 C -modified	NiL	5/18/2012
Conductivity	Conductivity @25C, APHA 2510 B -modified	NiL	5/22/2012
Corrosivity	Langelier Saturation Index, www.awwa.org	NiL	5/16/2012
E. coli (MF)	Partition method, APHA 9222 G -modified	NiL	5/17/2012
Fluoride	Ion Chromatography, EPA 300.1 -modified	NiL	5/17/2012
Hardness (CaCO3)	Hardness by Calculation, APHA 2340 B -modified	NiL	5/29/2012
Iron Bacteria	Subcontracted Test		5/16/2012
Nitrate (N)	Ion Chromatography, EPA 300.1 -modified	NiL	5/17/2012
Nitrite (N)	Ion Chromatography, EPA 300.1 -modified	NiL	5/17/2012
Non-Coliform Background	Membrane Filtration, APHA 9222-B -modified	NiL	5/17/2012
pH	Electrometric, APHA 4500 B -modified	NiL	5/17/2012
Sulphate	Ion Chromatography, EPA 300.1 -modified	NiL	5/17/2012
Sulphur Bacteria	Subcontracted Test		5/16/2012
T-Aluminium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Antimony	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Arsenic	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Barium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Beryllium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Bismuth	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012

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T-Boron	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Cadmium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Calcium	Exova Subcontract, ICP, APHA 3120B -modified	EXL	5/22/2012
T-Chromium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Cobalt	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Copper	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Iron	Exova Subcontract, ICP, APHA 3120B -modified	EXL	5/22/2012
T-Lead	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Lithium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Magnesium	Exova Subcontract, ICP, APHA 3120B -modified	EXL	5/22/2012
T-Manganese	Exova Subcontract, ICP, APHA 3120B -modified	EXL	5/22/2012
T-Molybdenum	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Nickel	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Phosphorus	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Potassium	Exova Subcontract, ICP, APHA 3120B	EXL	5/22/2012
T-Selenium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Silicon	Exova Subcontract, ICP, APHA 3120B	EXL	5/22/2012
T-Silver	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Sodium	Exova Subcontract, ICP, APHA 3120B	EXL	5/22/2012
T-Strontium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Thallium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Tin	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Titanium	Exova Subcontract, ICP, APHA 3120B	EXL	5/22/2012
T-Uranium	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
T-Vanadium	Exova Subcontract, ICP, APHA 3120B	EXL	5/22/2012
T-Zinc	Exova Subcontract, ICP-MS, USEPA 200.8-modified	EXL	5/22/2012
Total Ammonia (N)	Exova Subcontract, APHA 4500-NH3 C -modified	EXL	5/22/2012
Total Coliforms (MF)	Membrane Filtration, APHA 9222 B -modified	NiL	5/17/2012
Total Dissolved Solids	Exova Subcontract, dried @180C, APHA 2540C-modified	EXL	5/22/2012
Total Organic Carbon	Exova Subcontract, Ch.34 SSSA BookSeries5-modified	EXL	5/24/2012
Total Organic Nitrogen	Exova Subcontract, Ch.37 SSSA BookSeries5-modified	EXL	5/22/2012
Total Plate Count	Membrane Filtration, APHA 9215 D -modified	NiL	5/17/2012
Turbidity	Nephelometric, APHA 2130 B -modified	NiL	5/17/2012
UV Transmittance	APHA 5910 B -modified	NiL	5/18/2012

Approved By:

Ramona S. Lab Tech

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Your C.O.C. #: VI12944

Attention: Gord Martin
 Cowichan Bay Waterworks
 1760 Pavenham Rd
 Cowichan Bay, BC
 Canada V0R 1N1

Report Date: 2011/12/28

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1C1088
Received: 2011/12/14, 13:50

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity - Water (l)	1	2011/12/15	2011/12/14	VIC SOP-00001	Based on SM2320B
Chloride by Automated Colourimetry	1	N/A	2011/12/20	BBY6SOP-00011	SM-4500-Cl-
Colour (True) (l)	1	N/A	2011/12/19	VIC SOP-00010	Based on SM-2120B
Coliforms & E.coli by Quantitray (MPN) (l)	1	N/A	2011/12/15	VIC SOP-00102	Based on SM-9223
Conductance - water (l)	1	N/A	2011/12/14	VIC SOP-00003	Based on SM-2510
Fluoride	1	N/A	2011/12/22	BBY6SOP-00038	SM - 4500 F C
Iron Bacteria (l)	1	N/A	2011/12/14	BBY4 SOP-00004	Based on SM-9240
Hardness Total (calculated as CaCO3)	1	N/A	2011/12/23		
Heterotropic Plate Count Water Mem. Filtr (l)	1	N/A	2011/12/14	BBY4 SOP-00003	Based on SM-9215
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2011/12/23	BBY7SOP-00002	EPA 6020A
Elements by CRC ICPMS (total)	1	N/A	2011/12/23	BBY7SOP-00002	EPA 6020A
Nitrogen (Total)	1	2011/12/19	2011/12/19	BBY6SOP-00022	SM-4500N C
Ammonia-N	1	N/A	2011/12/19	BBY6SOP-00009	SM-4500NH3G
Nitrate + Nitrite (N) (l)	1	N/A	2011/12/15	VIC-SOP-00005	Based SM-4500 NO2 E
Nitrite (N) by CFA (l)	1	N/A	2011/12/15	VIC SOP-00005	Based SM-4500 NO2 B
Nitrogen - Nitrate (as N) (l)	1	N/A	2011/12/19	VIC SOP-00004	Based SM-4500 NO3 E
Nitrogen (Organic) (Cal. TKN, NH4,N/N)	1	N/A	2011/12/20		Calc
pH Water (l)	1	N/A	2011/12/14	VIC SOP-00006	Based on SM-4500 pH
Sat. pH and Langelier Index (@ 4.4C)	1	N/A	2011/12/23		
Sat. pH and Langelier Index (@ 60C)	1	N/A	2011/12/23		
Sulphate by Automated Colourimetry	1	N/A	2011/12/19	BBY6SOP-00017	SM4500-SO42
Sulphur Reducing Bacteria (l)	1	N/A	2011/12/14	70-C-203	Based on Sm-9240
Sulphide	1	N/A	2011/12/19	BBY6SOP-00006	SM-4500 S2D
Total Dissolved Solids (Filt. Residue) (l)	1	N/A	2011/12/16	VIC SOP-00008	Based on SM 2540C
Carbon (Total Organic)	1	N/A	2011/12/20	BBY6SOP-00003	SM-5310C
Turbidity (l)	1	N/A	2011/12/19	VIC SOP-00011	Based on SM - 2130

* Results relate only to the items tested.

(1) This test was performed by Maxxam Victoria

• Lists which tests were done, at which laboratory (Victoria or Vancouver), when tests done, the lab's method and the reference method.

• Tests with short holding times will be performed before tests with longer holding times.

VIHA POTABILITY WITH MICRO (WATER)

Maxxam ID					CJ1505		
Sampling Date					2011/12/14 11:50		
	Units	Criteria A	Criteria B	Criteria C	VALLEY VIEW WELL 13088	RDL	QC Batch
ANIONS							
Nitrite (N)	mg/L	1			<0.002	0.002	5454233
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	5	20	100	68.3	0.50	5451786
Nitrate (N)	mg/L	10			0.145	0.002	5452106
Misc. Inorganics							
Fluoride (F)	mg/L	1.5			0.071	0.010	5474927
Alkalinity (Total as CaCO3)	mg/L				66.6	0.5	5447868
Total Organic Carbon (C)	mg/L				0.90	0.50	5467688
Bicarbonate (HCO3)	mg/L				81.3	0.5	5447868
Carbonate (CO3)	mg/L				<0.5	0.5	5447868
Hydroxide (OH)	mg/L				<0.5	0.5	5447868
Anions							
Dissolved Sulphate (SO4)	mg/L				5.48	0.50	5464440
Dissolved Chloride (Cl)	mg/L				5.0	0.5	5467708
MISCELLANEOUS							
True Colour	Col. Unit				<5	5	5461339
Sulphide	mg/L				<0.0050	0.0050	5460668
Nutrients							
Ammonia (N)	mg/L				0.0068	0.0050	5462912
Total Organic Nitrogen (N)	mg/L				0.09	0.02	5452225
Nitrate plus Nitrite (N)	mg/L	10			0.145	0.002	5454320
Total Nitrogen (N)	mg/L				0.237	0.020	5464445
Physical Properties							
Conductivity	uS/cm				141	1	5447866
pH	pH Units				7.9		5447857
Physical Properties							
Total Dissolved Solids	mg/L				106	10	5456089
Turbidity	NTU				0.2	0.1	5461337

• “VIHA Potability with Micro (Water)” is the name of Maxxam’s test package

• Results are listed in the column “Valley View Well”

• Columns A and B list the Canadian Drinking Water Quality Guidelines (CDWQG) Maxxam includes only the MAC’s

• RDL gives you an idea how sensitive the test is

