

Envirosphere Consultants Limited

Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0

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Attn: Cecil Lockhart
Ellsworth Estates
55 Cedarwood Crescent
New Minas, NS
B4N 5J2

Re: Water sample results for well house on Andrew Drive, New Minas, Ellsworth Estates.
Sample received: February 6, 2019, Date of Bacterial Analysis: February 6 – 7, 2019
Sample identification: 8212
NSE Registered Water Supply Number: 2001-018876

February 14, 2019

Cecil Lockhart,

Your water sample *passed* the Canadian Drinking Water Quality Guidelines as indicated below by the absence of bacteria in your water sample. Please see the following pages for the chemicals, which were all within the acceptable limits according to the Canadian Drinking Water Quality Guidelines. In addition, the water is considered hard,

Results

E. coli	absent.	No evidence of sewage contamination (human or animal).
Total coliforms	absent.	No evidence of soil bacteria infiltrating into the well water via surface water.

Method Summaries—Total Coliform and E. coli: IDEXX, Colilert 24 hr, Defined Substrate Test: based on Standard Methods, 22nd Edition, 2012 and online version. ECL Method 1. Microbial Presence Absence. More information is available upon request.

Chemical Analysis

All chemical or water quality measurements were acceptable.

Hardness Elevated levels of hardness can lead to unacceptable taste, corrosion of piping and equipment, formation of scale in kettles, and excessive soap consumption. Excessively hard water can be unacceptable as drinking water due to taste and/or odour, and as domestic water due to the tendency of hard water to require more detergent or soap for cleaning. Hard water is not a health concern.

Recommendations

Please note, Nova Scotia Environment requires that registered water supply owners test their water four times a year for bacteria and once a year or every two years for chemical/mineral tests.

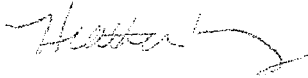
Keep in mind that the quality of the results are dependent on the quality of the sample given. If you have any questions concerning your water sample results, we would be happy to address them.

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Sincerely,



Heather Levy
Lab Manager

Report Checked by B

Complete Analysis Package (chemicals/minerals/bacteria)- well house on Andrew Drive, New Minas, sample ID 8212, Ellsworth Estates (Supply Number: 2001-018876).					
Determination	Result	Unit	Allowable Limits*	Regulation Status	Interpretation
pH	7.97	units	7.0-10.5	OG ³	Acceptable
Reactive Silica (SiO ₂)	7.1	mg/L		NR	Acceptable
Chloride	36	mg/L	≤ 250	AO	Acceptable
Fluoride	<0.12	mg/L	1.5	MAC	Acceptable
Sulfate	8	mg/L	≤ 500	AO	Acceptable
Alkalinity	118	mg/L		NR	Acceptable
True Color	<5	TCU	≤ 15	AO	Acceptable
Turbidity	1.0	NTU	≤1.0; ≤0.3; ≤0.1 ²	NR	Acceptable
Electrical Conductivity	364	uS/cm		NR	Acceptable
Nitrate+Nitrite (as Nitrogen)	1.05	mg/L		NR	Acceptable
Nitrate (as Nitrogen)	1.05	mg/L	10	MAC	Acceptable
Nitrite (as Nitrogen)	<0.05	mg/L	1.0	MAC	Acceptable
Ammonia (as Nitrogen)	<0.03	mg/L		NR	Acceptable
Total Organic Carbon	<0.5	mg/L		NR	Acceptable
Ortho-phosphate (P)	0.03	mg/L		NR	Acceptable
Total Sodium	7.6	mg/L	≤ 200	AO	Acceptable
Total Potassium	2.7	mg/L		NR	Acceptable
Total Calcium	52.9	mg/L		NR	Acceptable
Total Magnesium	3.2	mg/L		NR	Acceptable
Total Phosphorus	0.04	mg/L		NR	Acceptable
Bicarbonate Alkalinity (CaCO ₃)	118	mg/L		NR	Acceptable
Carbonate Alkalinity (CaCO ₃)	<10	mg/L		NR	Acceptable
Hydroxide	<5	mg/L		NR	Acceptable
Total Dissolved Solids (TDS) (Calculated)	186	mg/L	≤ 500	AO	Acceptable
Hardness	145	mg/L	0-30 very soft 31- 60 soft 61-120 moderately soft 121-180 hard > 180, very hard	NR	Hard
Total Aluminum	9	µg/L	100/200	OG ³	Acceptable
Total Antimony	<2	µg/L	6	MAC	Acceptable
Total Arsenic	<2	µg/L	10	MAC	Acceptable
Total Barium	39	µg/L	1000	MAC	Acceptable
Total Beryllium	<2	µg/L		NR	Acceptable
Total Bismuth	<2	µg/L		NR	Acceptable

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Complete Analysis Package (chemicals/minerals/bacteria)- well house on Andrew Drive, New Minas, sample ID 8212, Ellsworth Estates (Supply Number: 2001-018876).					
Determination	Result	Unit	Allowable Limits*	Regulation Status	Interpretation
Total Boron	10	µg/L	5000	MAC	Acceptable
Total Cadmium	<0.09	µg/L	5	MAC	Acceptable
Total Chromium	<1	µg/L	50	MAC	Acceptable
Total Cobalt	<1	µg/L		NR	Acceptable
Total Copper	1	µg/L	≤ 1000	AO	Acceptable
Total Iron	<50	µg/L	≤ 300	AO	Acceptable
Total Lead	<0.5	µg/L	10	MAC	Acceptable
Total Manganese	2	µg/L	≤ 50	AO	Acceptable
Total Molybdenum	<2	µg/L		NR	Acceptable
Total Nickel	<2	µg/L		NR	Acceptable
Total Selenium	<1	µg/L	50	MAC	Acceptable
Total Silver	<0.1	µg/L		NR	Acceptable
Total Strontium	415	µg/L		NR	Acceptable
Total Thallium	<0.1	µg/L		NR	Acceptable
Total Tin	<2	µg/L		NR	Acceptable
Total Titanium	<2	µg/L		NR	Acceptable
Total Uranium	2.7	µg/L	20	MAC	Acceptable
Total Vanadium	<2	µg/L		NR	Acceptable
Total Zinc	<5	µg/L	≤ 5000	AO	Acceptable
E. coli	Absent				
Total Coliforms	Absent				

* Based on: Guidelines for Canadian Drinking Water Quality (Health Canada, 2017).

1 pH range for finished drinking water.

2 Health Canada guidance values for turbidity are:

≤ 1.0 NTU – slow sand and diatomaceous earth filtration (i.e. dug/drilled wells);

≤ 0.3 NTU – conventional and direct filtration; and

≤ 0.1 NTU – membrane filtration.

MAC or AO Health Canada guidelines have not been established for turbidity.

3 This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum based coagulants.

Description of Terms:

NR = Not currently regulated;

MAC = Maximum Acceptable Concentration;

AO = Aesthetic Objective (based on consumer taste and visual preferences);

OG = Operational Guideline.

1mg/L = 1000µg/L

Note: The analyses for chemicals/minerals/metals were subcontracted to an accredited laboratory. *More information is available upon request.*

Hard Water

Hard water is water with a high mineral content. Water is made hard by high levels of metal ions, mainly calcium (Ca²⁺) and magnesium (Mg²⁺) in the form of carbonates.

Sources

Water hardness in most groundwater is naturally occurring from weathering of sedimentary rock and calcium-bearing minerals, such as calcite, limestone, dolomite, or gypsum.

Hard water can also occur locally in groundwater from chemical and mining industry effluent or excessive use of lime in agriculture.

Aesthetic Objective for Drinking Water

Water hardness is measured by adding up the concentrations of calcium and magnesium, and converting this value to an equivalent concentration of calcium carbonate (CaCO₃).

QUICK FACTS

- Hard water is caused by the presence of minerals such as calcium and magnesium.
- Human activities may also contribute to hardness of groundwater in certain areas.
- Hardness in the form of equivalent CaCO₃ concentration can be detected through chemical testing.
- No numerical guidelines for hardness exist, but the Guidelines for Canadian Drinking Water Quality divide hardness into four categories – soft, medium, hard, and very hard – based on equivalent CaCO₃ concentrations.
- Hard water is not considered a health risk at equivalent CaCO₃ concentrations normally found in Nova Scotia.
- Treatment systems are available to reduce water hardness.

Regular Testing

Homeowners are responsible for monitoring the quality of their private water supply:

- Test for bacterial quality every 6 months.
- Test for chemical quality every 2 years.
- Test more often if you notice changes in physical qualities – taste, smell, or colour.

Regular testing alerts you to problems with your drinking water.

No numerical guideline for hardness exists, but the Guidelines for Canadian Drinking Water Quality divide hardness into four categories:

Soft – less than 60 milligrams per litre (mg/L) of equivalent CaCO_3

Medium – 60 mg/L to 120 mg/L of equivalent CaCO_3

Hard – 120 to 180 mg/L of equivalent CaCO_3

Very hard – greater than 180 mg/L of equivalent CaCO_3

The optimum range of hardness in drinking water is from 80 to 100 mg/L. Water with hardness greater than 200 mg/L is considered poor, but can be tolerated. Water with hardness greater than 500 mg/L is normally considered unacceptable for domestic purposes.

Health Risks

Hard water is not a health risk. It is mainly an aesthetic concern, because of the taste that a high concentration of calcium and other ions give to water.

Hard water also reduces the ability of soap to produce a lather and causes scale formation in pipes, on plumbing fixtures, and in heating systems.

In agricultural areas where lime and fertilizers are applied to the land, excessive hardness may indicate the presence of other chemicals such as nitrate.

In very rare cases where CaCO_3 concentrations in drinking water are greater than 1000 mg/L, hard water has been associated with an increased incidence of gallstones and kidney stones.

Testing

Regularly test your well water for a standard suite of chemical parameters, including hardness. Use an accredited water testing laboratory. Find a list of accredited water testing laboratories at www.novascotia.ca/nse/water/waterlabs.asp or see the Yellow Pages under "laboratories."

Get the special sampling bottles and instructions on proper sampling from the laboratory.

The cost of analyzing water samples can range from \$15 for a single parameter to \$230 for a full suite of chemical parameters. The cost can vary depending on the lab and the number of parameters being tested.

Solutions

If well water is found to be excessively hard (greater than 180 mg/L of CaCO_3), get a second test to confirm the original results.

Hardness is an aesthetic parameter. Aesthetic parameters may impair the taste, smell, or colour of water. Although hardness does not pose a health risk at levels normally found in well water, it can affect the function and lifetime of the plumbing system and appliances.

If excessive hardness is confirmed (greater than 180 mg/L of CaCO_3), treating your water is optional. You may choose to treat your water to

- improve the taste and make it more pleasing to consume
- increase the ability of soap to produce a lather
- decrease scale formation on well and plumbing materials as well as appliances

Treatment

The most common treatment method to reduce hardness in drinking water is ion exchange (water softener). Ion exchange works by pumping water through a tank containing a resin. This causes calcium and magnesium ions to be exchanged for sodium or potassium ions. This increases the concentration of sodium or potassium in the water.

Another effective treatment method is reverse osmosis.

Buy a treatment system that has been certified to meet the current NSF standards for hardness reduction. NSF International is a not-for-profit, non-governmental organization that sets health and safety standards for manufacturers in 80 countries. See its website at www.nsf.org.

Once installed, re-test your water to ensure the treatment system is working properly. Maintain the system according to the manufacturer's instructions to ensure a continued supply of safe drinking water.

For more information on water treatment, see our publications *Water Treatment Options* and *Maintaining Your Water Treatment*, part of the *Your Well Water* booklet series at www.novascotia.ca/nse/water/privatewells.asp.

Considerations for ion exchange (water softener) method

An increase in sodium concentration may be a concern to those on sodium-reduced diets. See our fact sheet on sodium for more information.

An increase in potassium may cause adverse health effects to those with kidney dysfunction or those taking medications that interfere with normal potassium-dependent functions in the body. See our fact sheet on potassium for more information.

The Guidelines for Canadian Drinking Water Quality recommend that if you use ion exchange (water softener) for treatment, keep a separate, non-softened water supply for drinking and cooking.

Drinking Water Interpretation Tool (DWIT)

You can compare guidelines for many common drinking water quality parameters by entering your well water test results in the NSE Drinking Water Interpretation Tool at: novascotia.ca/nse/dwit

FOR MORE INFORMATION CONTACT

Nova Scotia Environment at
1-877-9ENVIRO
or 1-877-936-8476
www.novascotia.ca/nse/water