

You can refer to the Nova Scotia Agriculture and Fisheries Quality Evaluation Division Laboratory Services website for tables and calculations on how to determine the correct amount of chlorine needed <http://www.gov.ns.ca/nsaf/qe/analytical/welldis.htm>. Tables and procedures for well disinfection can also be found on NSDEL website at:

<http://www.gov.ns.ca/enla/rmep/h2o.htm>.

Sources of Bacterial Contamination

Disinfecting your well is critical when laboratory tests confirm the presence of bacteria. An important issue however, is identifying and eliminating the source of contamination. While chlorination will kill bacteria in a well, if there is an external source of contamination the problem will return. If your water continues to show the presence of bacteria following the disinfection of your well, you should retest the water to make sure the sample was not contaminated during sampling. If the test still continues to show bacterial contamination you must find the source. This can be done by examining both well location and well construction.

A well should be located in an area that is easily accessible for maintenance, repairs, testing and treatment.



A Properly Sealed Dug Well



A Drilled Well With an Approved Vermin-proof Vented Pitless Well Cap and At Least 6 inches of Casing Above the Land Surface

Disinfection will only kill bacteria that is present in your well. External sources of well contamination must be located and dealt with to ensure a healthy water supply.

Proper Installation and Maintenance for a Well to Avoid Bacterial Contamination

A drilled well must be located :

- at least 15 m (50 ft) from a septic tank or any other part of an on-site disposal system or non-tight sewer line

A dug well must be located:

- at least 30 m (100 ft) from a septic tank or any other part of an on-site disposal system or non-tight sewer line

Both drilled and dug wells must be at located:

- at least 100 m (330 ft) from any feedlot, manure storage or livestock yard.

For other separation distances, see the NS Well Construction Regulations under the Environment Act, which can be accessed through the website www.gov.ns.ca/just/regulations/conregs.htm.

Manure spreading must be kept:

- at least 30 m (100 ft) from an existing well where the soil is clay or clay loam
- at least 60 m (200 ft) from an existing well where soil is sand or gravel.

A well should also;

- have a properly sealed casing,
- have a watertight vermin-proof cap with shielded and screened vent (drilled well),
- have a tight cover with shielded and screened vent (dug well) and
- have at least 15 cm (6 inches) of casing above the land surface.

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Laboratory Tests for WATER QUALITY factsheet

Who Should Test Your Water?

The majority of people who live in urban areas get their water from a source that is monitored on a regular basis by their town or village. This is considered a public drinking water supply and you will be informed if the water does not meet the Guidelines for Canadian Drinking Water Quality.

If you live in a rural area, your water typically comes from your own private well. It is therefore your responsibility to monitor the quality of the water that comes from your well and make sure that it is safe for consumption.

What to Test Your Water For?

Water should be tested for both health and aesthetic problems.

Maximum acceptable concentrations (MAC) for individual parameters have been carefully calculated from long-term scientific investigations. These MAC are used for substances that are known or suspected to cause adverse effects on health.

Aesthetic objectives (AO) are used when certain levels of a substance may affect its acceptance by consumers or interfere with practices for supplying good water.

Municipal and private water sources should meet all MAC guidelines to maintain a healthy water supply. Meeting the AO are not necessary to ensure a healthy water supply, but are used as guidelines to make drinking water acceptable for the consumer in terms of the smell, taste and appearance.

To determine if your water is contaminated it should be tested for bacteria and chemical quality. Most often, chemical and physical tests on your water can provide answers to why you may be having aesthetic problems with your water.

Regular water testing can help identify water quality problems that may otherwise go

Many laboratories offer packages on water analysis that include a variety of parameters. Contact a local laboratory to determine costs and when testing is available (eg. some laboratories will only accept water samples for bacteria testing from Monday through Thursday). Different areas throughout the province and even within local areas may experience particular types of contamination. Individuals should be aware of existing water quality concerns in their area and maintain a record of past water test results.

The only way to ensure your water supply is safe is to have it tested.

When To Test Your Water Supply?

Harmful bacterial or chemicals can be present in drinking water that looks, smells and even tastes fine. To ensure that your drinking water supply is safe, it should be tested on a regular basis. It is recommended that drinking water be tested every six months for bacteria and every 1 to 2 years for chemicals. If water quality problems are being experienced, more frequent testing may be necessary.

Where to Get Your Water Tested?

There are a number of accredited laboratories throughout the province. A complete list can be obtained by contacting Nova Scotia Environment and Labour directly or online at: <http://www.gov.ns.ca/Enla/RMEP/labs.htm>. Local phone numbers can also be found by looking under "laboratories" in your yellowpages. It is a good idea to contact the laboratories located in your area and inquire about the capabilities of the facility. While all laboratories on the list are equipped for general bacterial testing, there are some labs that are not equipped for a complete chemical analysis of water samples.



Steps for Collecting a Water Sample for Bacteria

1. Use sterile, or appropriate sample bottles obtained from your local laboratory. Sample bottles for bacteria samples often contain a sodium thiosulfate preservative and will interfere with mineral analysis.
2. Do not open the bottle until you are ready to take your sample.
3. Do not touch the inside of the cap or bottle. Do not lay the cap down, hold the cap in your hand with the inside facing down while sampling.
4. Remove any devices attached to the tap.
5. If sampling from a tap, allow the water to run for 3 to 5 minutes before collecting the sample.
6. Do not rinse the sample bottle. Collect the sample directly into the bottle.
7. Slowly fill the bottle approximately 3/4th full. Do not allow the bottle to overflow. The size of the bottle may vary depending on the method the lab will use for analysis.
8. Label the sample bottle with your name, address, date and time of collection and the parameter(s) the sample is being tested for.
9. Refrigerate the sample immediately until delivered to the lab, no later than 24 hours following sample collection.

Why Should You Get Your Water Tested?

Testing your water ensures that it is safe to drink. Contaminated water can cause a number of health concerns. Testing your water can also identify problems associated with abnormal odour, taste and color which, once identified, can be dealt with appropriately.

How to Collect a Proper Water Sample?

The water sample should be taken from the same location that is normally used to obtain your drinking water. To ensure that a sample is accurate and does not become contaminated during sampling, several precautions should be taken (see Steps for Collecting a Water Sample for Bacteria and Steps for Collecting a Water Sample for Chemical Quality). Proper sampling techniques vary for bacterial and chemical analysis and may vary depending on the specific parameter the water sample is being tested for. Contact your local laboratory for additional information.



Canadian Drinking Water Quality Guidelines

Canadian Drinking Water Quality Guidelines have been developed to ensure the protection of human health. The latest guidelines for microbiological, chemical, physical and radiological parameters can all be found in the summary table of guidelines on Health Canada's website at: www.hc-sc.gc.ca/ehp/ehd/bch/water_quality.htm. These guidelines include maximum acceptable concentrations and aesthetic objectives. More detailed information on these guidelines is also accessible from this site.

Interpreting Your Laboratory Results

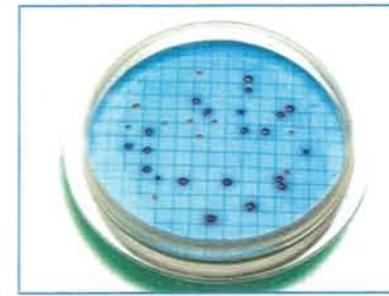
Laboratory results are typically available within a few days for most water quality parameters, depending on the laboratory. Samples of high priority can be performed immediately, usually at an additional cost. Many laboratories will contact you immediately if your water sample tests positive for bacteria to ensure proper measures are taken. Other results are sent in the form of a report by mail or can be picked up in person.

The laboratory report will include a list of tested parameters and the results with appropriate units. Your results should be compared to the Canadian Drinking Water Quality Guidelines to determine if a water quality problem exists. It is important to take note of the units that are used by the guidelines and the units which are used by your laboratory. Nitrate, for example is typically reported as milligrams of nitrogen (N) per litre of water (mg/L, N). This would be compared to the guideline of 10 mg/L. However, it may also be reported as milligrams of nitrate (NO₃) per litre of water (mg/L, NO₃), changing the guideline to 45 mg/L. Laboratories often include brochures on the specific parameters tested or interpretations of the results.

Bacterial Tests

Bacterial contamination may not be detected by taste, sight, or smell. To determine if your water supply contains bacteria it must be tested. The type of bacteria test performed depends on the intended use of the water. If it is from a potential drinking water source a presence/absence test for total coliforms and fecal coliforms should be performed. The presence of coliforms indicate that the water is not safe to drink. If the water is going to be used for recreational or irrigation purposes, an actual bacterial count should be obtained. The guideline for recreational water use is 200 CFU/100mL and 100 CFU/100 mL for irrigation.

Testing for specific types of bacteria can be costly and unnecessary. For these reasons total coliform, fecal coliform and *E. coli* are used as indicators of the bacterial safety of water.



Petri Dish Showing a Positive Result for Fecal Coliforms

Canadian Drinking Water Quality Guidelines for Selected Substances

Parameter	Maximum Acceptable Concentration	Aesthetic Objective
Bacteria (CFU/100 mL)		
Total coliform	0	
Fecal coliform	0	
Arsenic (mg/L)	0.025	
Chloride (mg/L)		≤ 250
Copper (mg/L)		≤ 1.0
Iron (mg/L)		≤ 0.3
Manganese (mg/L)		≤ 0.05
Nitrate-nitrogen (mg/L)	10	
Sodium (mg/L)		≤ 200
Sulphate (mg/L)		≤ 500
Uranium (mg/L)	0.02	
Zinc (mg L ⁻¹)		≤ 5.0

[Http://www.hc-sc.gc.ca/ehp/ehd/catalogue/bch_pubs/dwgsup_doc/dwgsup_doc.htm](http://www.hc-sc.gc.ca/ehp/ehd/catalogue/bch_pubs/dwgsup_doc/dwgsup_doc.htm)

Steps for Collecting a Water Sample for Chemical Quality

1. Use a clean appropriate sample bottle obtained from your local laboratory.
2. Remove any devices attached to the tap.
3. If sampling from a tap, allow the water to run for 10 minutes before collecting the sample.
4. Rinse the sample bottle and cap 2 to 3 times.
5. With water running gently, fill the bottle to the top (overflow) and cap tightly with no air gaps.
6. Label the sample bottle with your name, address, date and time of collection and the parameter(s) the sample is being tested for.
7. Refrigerate the sample immediately or place it in a cooler and store at 4 C in the dark until transported to the lab (preferably, no later than 24 hours following sample collection).

Disinfecting Your Well

Positive identification of bacteria in a water supply should be dealt with immediately to avoid potential disease causing organisms from infecting humans. For well users, the most common method of eliminating bacteria is through chlorination. Liquid chlorine, chlorine tablets or chlorine powder may all be placed into wells for disinfection. To ensure a well is properly disinfected sufficient chlorine should be added to produce 100 mg/L of chlorine in solution when it is mixed with the water found in the well.