

Why Should Drinking Water Be Tested for Bacteria?

Several germs that cause disease in humans are carried by humans and animals in their gut and excreted in feces. Drinking water can become contaminated with human or animal feces by surface run-off and septic tank malfunction etc. When fecal contamination occurs, there is **potential** for disease causing germs to be present. Therefore, it is important to ensure there is no fecal contamination of drinking water.

How is Drinking Water Quality Tested for Bacterial Quality?

Indicator bacteria are used to assess the bacterial quality of drinking water. These are “Total Coliforms” and “Fecal Coliform”.

Why Are Coliform Bacteria Used for Testing Drinking Water?

Total coliforms are a group of bacteria that are naturally present in the environment. They are used as an indicator of overall water quality and the effectiveness of drinking water disinfection.

***E. coli*, a fecal coliform**, originate only in the intestine of humans and animals, and are regularly excreted in feces in abundant numbers. Therefore, *E. coli* is used as an indicator of fecal contamination of drinking water.

The above indicator bacteria are used as universal indicators of drinking water quality because it is neither practical nor feasible to test for individual disease causing organisms in drinking water.

Do Indicator Bacteria Cause Disease?

No. Neither total coliforms nor the fecal coliform *E. coli* by themselves cause gastrointestinal disease in humans. The fecal coliform *E. coli* that makes up the natural intestinal microbial population does not cause waterborne or foodborne illness. However, the presence of the indicator bacteria suggests a potential for disease causing organisms to be in drinking water.

What Are Some Disease Causing Organisms That May Be Present in Drinking Water?

When the fecal coliform indicator *bacteria E. coli* is present, there is potential for disease causing organisms to be present. These include germs like *Salmonella*, *Campylobacter*, *E. coli O157*, and *Giardia*. Adequate treatment (e.g., disinfection) of municipal drinking water sources and the proper construction and location of private wells should prevent fecal contamination.

How Can I Have My Drinking Water Tested?

Water sample collection kits can be obtained from the Public Health Laboratory at the Miller Centre on Forest Road in St. John’s or a Government Service Centre in your area. Please refer to the **Bacteriological Water Analysis Request/Report** form for instructions on the collection of water samples and the submission of samples for testing.

What Does Your Report Mean?

Unsatisfactory Result:

A private well water sample is considered **unsatisfactory**, and unsafe for drinking, when the fecal coliform *E. coli* is present.

An unsatisfactory result indicates fecal contamination of the well. The drinking water should be boiled and corrective action should be taken to deal with fecal contamination entering the well. Retesting should be carried out following appropriate corrective action.

Substandard Result:

A private well water sample is considered **substandard**, but not an immediate health risk, when testing reveals greater than 10 total coliforms but no *E. coli*.

A substandard result indicates that surface water may be getting into the well and therefore at risk of fecal contamination, or that a bacterial growth has developed within the well or plumbing system. Suitable disinfection of the well should be undertaken and the water retested to ensure there is no fecal contamination. Until disinfection is carried out and retest results are known, the water may be boiled or an alternate safe source may be used.

Satisfactory Result:

A private well water sample is considered **satisfactory** when total coliforms don’t exceed 10 and the fecal coliform *E. coli* is absent.

A satisfactory result meets with the provincial standard for the bacteriological quality of drinking water.

Occasionally, test results are reported as “overgrowth-unable to interpret”. This is due to the presence of excessive environmental bacteria that interferes with the test. A repeat sample is suggested. If problems persist contact a environmental health officer / public health inspector at the Government Service Centre

What Should I Do If I Have an Unsatisfactory or Substandard Test Result?

1. Verify the safe condition/construction of the well including the wellhead, pump, plumbing, well liner and surrounding area. Correct any problems that are identified.

Where the fecal coliform *E. coli* is detected in a water sample, sources of fecal contamination such as improperly working septic systems, wild animals, domestic animals and pets should also be considered.

2. Shock chlorinate the well and plumbing system (see instructions in the tables that follow), then flush the system to remove chlorine and retest the water no sooner than 48 hours after shock chlorination
3. If the water remains contaminated after the shock chlorination, continue to boil the drinking water and consider the following:

- ▶ an appropriate disinfection device
- ▶ well reconstruction
- ▶ well replacement

How Can Well Water Be Disinfected?

If test results are unsatisfactory or substandard it is necessary to shock treat the well and, if possible, find and eliminate the source of contamination. Disinfection can be done using unscented household bleach. The following tables outline the quantity of bleach required to properly disinfect new and existing wells.

Volume of bleach to be added to New Wells*

Depth of Water in Well	Casing Diameter	
	15 cm (drilled)	90 cm (dug)
1.0 m	100 mL	3.2 L
3.0 m	300 mL	9.8 L
5.0 m	500 mL	16.5 L
10.0 m	1000 mL	32.0 L

Volume of bleach to be added to Existing Wells

Depth of Water in Well	Casing Diameter	
	15 cm (drilled)	90 cm (dug)
1.0 m	20 mL	0.6 L
3.0 m	60 mL	2.0 L
5.0 m	100 mL	3.0 L
10.0 m	200 mL	6.5 L

* New wells require a higher chlorine concentration

Steps for Chlorine Disinfection

- Add the amount of unscented bleach determined according to the table to the bottom of the well and then agitate the water. Connect a garden hose to a nearby tap and wash down the inside wall of the well. This will ensure thorough mixing of the chlorine and the water throughout the well.

- Open each tap and allow the water to run through all taps until a smell of chlorine is detected, then turn off the taps. If a strong smell is not detected, add more bleach to the well.
- Allow the water to sit in the system for 12-24 hours.
- Run water through the outside hose away from grass and shrubbery until the strong smell of chlorine disappears. Make certain that the water does not enter any watercourse. Finally, open the indoor taps until the system is completely flushed.
- Wait a minimum 48 hours, then take a sample of the water for bacteriological testing. Satisfactory results in repeat tests over a period of one to three weeks following chlorination will probably indicate that the treatment has been effective. In the meantime, find another source of water or boil the water for one minute before drinking it. Do not use untreated water such as roadside springs.
- If the shock treatment solves the problem, repeat bacteriological testing in three to four months.
- If the above steps do not alleviate the problem, it is recommended that the source of the ongoing contamination be determined and corrected, possibly with professional help. If remediation is not possible, a permanent alternative solution, such as a new well or a drinking water disinfection device, should be considered.

How Can Small Volumes of Contaminated Water Be Made Bacteriologically Safe For Drinking?

BOILING

Bring water to a vigorous boil for one minute and allow to cool; this is by far the most reliable method.

CHLORINATING

To treat small amounts of water use unscented household bleach at the rate of at least **two drops per each litre of water** and allow the water stand for 30 minutes. If the water is turbid or cloudy, double the number of drops.

For Additional Information and Services Contact the Government Service Centre Nearest Your Community.

St. John's.....	709-729-0485
Harbour Grace.....	709-945-3107
Clareville.....	709-466-4060
Corner Brook.....	709-637-2204
Happy Valley-Goose Bay.....	709-896-2661
Grand Falls-Windsor.....	709-292-4206
Gander.....	709-256-1420



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NEWFOUNDLAND AND LABRADOR

Department of Government Services and Lands
Department of Health and Community Services

A GUIDE TO SAFE DRINKING WATER



DRINKING WATER AWARENESS

