

# A Guide to Safe Drinking Water

## Why should drinking water be tested for bacteria?

Water for drinking, cooking, brushing teeth, washing dishes and other domestic uses should be from a safe water supply. This means that the water from your well should be free from microorganisms, like bacteria, viruses and protozoa (e.g., *Giardia*) that may cause disease. Testing your well water gives you a better picture of your well water quality, and tells you whether or not it is safe to drink.

## How is drinking water quality tested for bacterial quality?

Your drinking water is tested for the presence of indicator bacteria, specifically total coliforms and *Escherichia coli* (*E. coli*). Their presence indicates that your well may be contaminated by disease-causing microorganisms or at risk of contamination.

**Total coliforms** are a group of bacteria that can be found everywhere in the environment. Their presence in a drinking water sample indicates that there may be contamination because of problems with the well construction such as cracks in the casing or an improper seal around the wellhead. A properly constructed well should not allow surface water to enter the well.

*E. coli* is the only member of the coliform family of bacteria that is found only in the intestines of humans and animals. The presence of *E. coli* indicates recent contamination of your drinking water from human or animal feces which can also contain other harmful, disease causing organisms. These include bacteria such as *Salmonella*, *Campylobacter*, *E. coli* 0157 and *Giardia*.

## How can I have my drinking water tested?

Water sample collection kits to test your water for bacteriological quality can be obtained from the Public Health Laboratory at the Miller Centre on Forest Road in St. John's or a Government Service Centre office 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?

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

**2) Substandard Result:** A private well water sample is considered substandard, but not an immediate health risk, when testing reveals total coliforms but no *E. coli*. 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.

**3) Satisfactory Result:** A private well water sample is considered satisfactory when total coliforms and the fecal coliform *E. coli* are absent.

**The results of tests performed by the Public Health Laboratory are for bacteriological water quality only. Your water supply should be tested for chemical quality every two years to ensure it is free of potential contaminants such as arsenic. To have your water tested for chemical quality contact an accredited private laboratory. Information is provided at <http://www.mae.gov.nl.ca/waterres/quality/labs.html>**

## What should I do if I have an unsatisfactory or substandard test result?

1. Verify proper construction of the well including the well head, pump, plumbing, and well liner. Correct any problems that are identified. When *E. coli* is detected sources of fecal contamination such as improperly working septic systems and feces from pets and wild animals should also be considered. Please refer to the “*Sanitary Dug Well*” information sheet for guidance with respect to the construction of dug wells.
2. Shock chlorinate the well and plumbing system (see instructions in the table below).
3. If the water remains contaminated after the shock chlorination, continue to boil the drinking water and consider an appropriate disinfection device or well reconstruction or replacement.

### Steps for shock chlorinating a well:

1. Add the amount of unscented bleach to the well as determined according to the table below. Connect a garden hose to a household tap and wash down the inside wall of the well. This will ensure thorough mixing of the chlorine and the water throughout the well.
2. Open each tap in the home one at a time and allow the water to run through all taps until a smell of chlorine is detected from each. Then turn off the taps. If a strong smell is not detected, add more bleach to the well.
3. Allow the water to sit in the system for 12-24 hours.
4. Run water through the outside hose away from grass and shrubbery until the strong smell of chlorine disappears. Do not allow heavily chlorinated water to drain into the septic tank, as it may interfere with its functioning. Make certain that the water does not enter any watercourse. Finally, once the smell of chlorine has significantly dissipated, open the indoor taps until the system is completely flushed.
5. 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.
6. If the above steps do not correct the problem, the source of the ongoing contamination needs to be determined and corrected, possibly with professional help. If the problem can not be corrected, a new well or a drinking water disinfection device, should be considered.

Depth of Water	New Well Casing Diameter		Existing Well Casing Diameter	
	15 cm drilled well	90 cm dug well	15 cm drilled well	90 cm dug well
<b>1 m</b>	100 ml	3.2 L	20 ml	0.6 L
<b>3 m</b>	300 ml	9.8 L	60 ml	2.0 L
<b>5 m</b>	500 ml	16L	100 ml	3.0 L
<b>10 m</b>	1000 ml	32 L	200 ml	6.5 L

## How can small volumes of contaminated water be made 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 liter 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:

Please contact an Environmental Health Officer at a Service NL Government Service Centre location