



Bacterial quality is probably the most important consideration in assessing drinking water. If you are sampling your water because you suspect a water quality problem, you should boil your water before drinking it until test results are complete.

The PEI Analytical Laboratories provides bacterial water testing services to municipalities that have water systems, and to Island residents whose water comes from a private well. There are four basic steps in testing water for bacteria:

- ◆ collecting the sample
- ◆ filtering the water
- ◆ incubating the sample
- ◆ reading the results

Collecting the Sample

Water samples must be collected in sterilized bottles which can be picked up at any Access PEI Centre. To collect the sample, remove the strainer from the tap and let the water run for five minutes to ensure a fresh sample is coming from the well itself and not the pipes or pressure tank. Reduce the water flow when filling the bottle so the water does not splash. Do not allow the bottle to overflow, and be careful not to touch the rim of the bottle or the inside of the cap to any other surface.



Once the sample is taken, keep it in the refrigerator until it is delivered. Samples taken for water testing must be “fresh”, that is less than 24 hours old and preferably much less. Delivering the sample within a couple of hours of sampling is best.

Filtering the Water

At the lab, a technician pours 100 ml of water from the sample into a filtering funnel. The size of the pores in the filter is smaller than the bacteria being tested, so the filter will capture the bacteria.



Incubating the Sample



The filter is removed from the funnel and placed in a petri dish containing a type of agar which is a growth medium for coliform bacteria. It is incubated at a standard temperature, 35°C, for a standard period of time, 24 hours.

Reading the Results

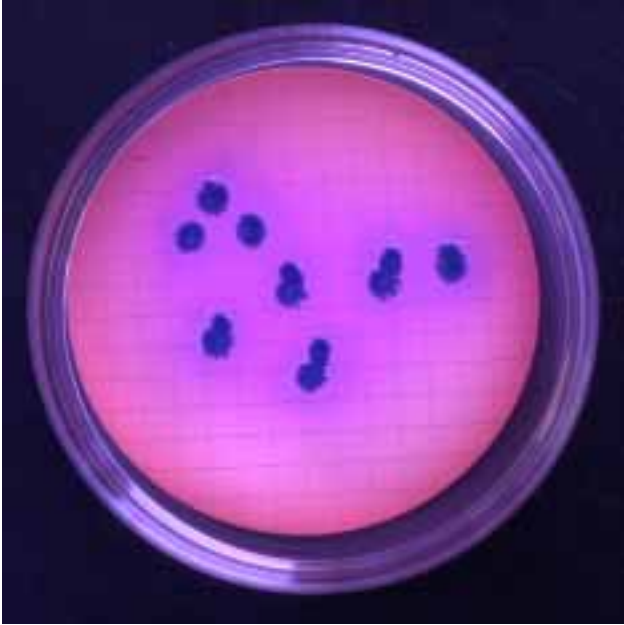
When the incubation process is complete, the lab technician examines the filter - using a hand lens with 10 times magnification - looking for bacteria colonies with specific characteristics.

The testing process is like a litmus test for bacteria.

- ⊙ E. coli appears as blue circles with each circle representing a colony.
- ⊙ Total coliform presents as pink colonies.
- ⊙ Background growth is usually seen as yellow colonies.

The bacteria count is determined simply by counting the number of colonies with the results reported in counts per 100 ml. The filters that are used have a grid which makes the task of counting the colonies easier.

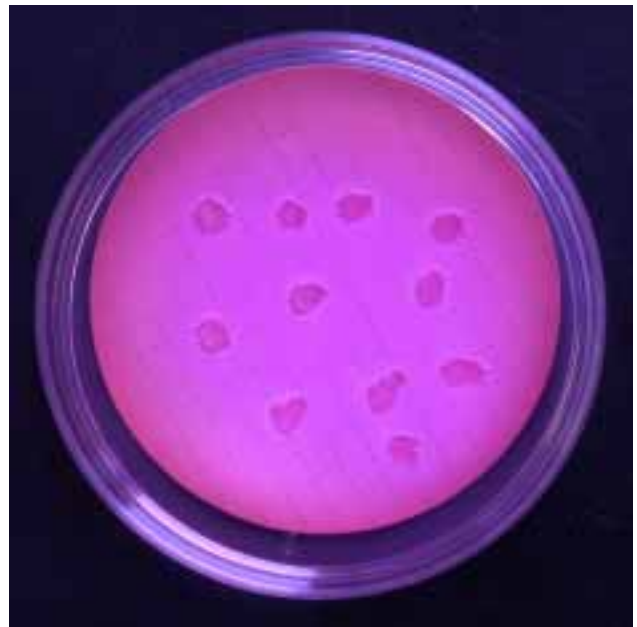
What the Results Mean



E. coli

When *E. coli* is detected in water it usually indicates fecal contamination - either from human, agricultural or wildlife sources. Any count of *E. coli* bacteria would make the water unfit to drink.

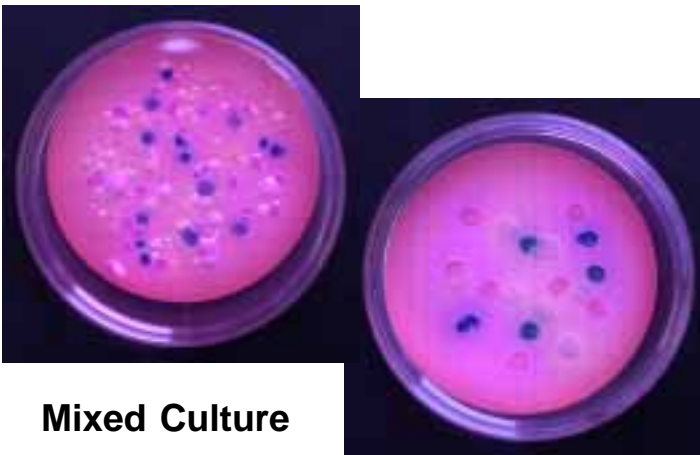
Background growth is an indicator of the general bacterial population in a sample. It is only a concern if the count exceeds 200 per 100 ml. In that case, it may be an indication that the water pipes or other aspects of the system may need to be inspected and flushed.



Total Coliform

Coliforms are a group of bacteria found in soil, on vegetation and in large numbers in the intestines of warm-blooded animals including humans. They are not normally found in groundwater that is well protected from surface influences.

Most are not disease-causing organisms, but they serve as an indicator of the sanitary condition of a water supply. If coliform bacteria are present, it may be possible for *E. coli* or other disease-causing bacteria to enter the system.



Mixed Culture