

Coliform Bacterial Testing and Results (Private Wells) Frequently Asked Questions

Thank you for choosing GeoWater Services for your water testing and treatment needs. Our microbiology laboratory is licensed, certified and audited by the State of Colorado Department of Public Health and Environment (License# CO01044), and managed by a degreed microbiologist. Below are some frequently asked questions (FAQs) regarding bacterial testing, what the results mean, and options for remediation in case of failing test results.

Why a “bacterial” test?

Routine bacterial testing of private wells is recommended at least once per year. Bacterial testing is also the most common test performed as part of the due diligence / inspection process when purchasing a new home. The bacterial test is the most common test performed (possibly in conjunction with other testing) to determine if the well water is safe to drink.

Is well water free from coliform bacteria (“Absent”) the same as “Potable”?

No. Per EPA definition, potable water is defined as “water that is safe for drinking and cooking.” Water that is free from bacterial contamination could include other contaminants that would cause the water to be “non-potable”.

What are coliform bacteria (total & fecal)?

Per EPA definition, coliform bacteria are:

“The most common form of bacteria found in untreated water. The presence of this group of bacteria is an indicator that the water may be contaminated...and should not be ingested. Fecal coliform bacteria, of which E.coli is one type, live in the intestines of warm blooded animals. Pathogenic coliforms can cause diarrhea and other serious health problems if the bacteria are ingested [FDA 2001]”

Total coliform failures are fairly common in private wells. In most cases, non-fecal coliform bacteria (test result of “Total = Present”, Fecal = Absent”) are not considered a health concern directly, but are an indicator that conditions in the well exist that may lead to a future fecal failure. Fecal failures are much less common and should be considered.

What is the source of the bacterial contamination?

In most cases, the actual cause of the bacterial contamination is difficult to determine. Obvious causes can include unsanitary (open) well heads, well heads that do not meet the statutory 12” height requirement, improperly constructed / drained well vaults, unsanitary storage tanks or cisterns, well pump replacement without proper chlorination, etc. In cases where there is no obvious system defect, the most likely cause is natural surface or shallow sub-surface water carrying organic material into the well water supply.

What are my options if coliform bacteria is “Present”

- Re-test: Proper sampling procedures are critical for accurate bacterial test results. Improper sampling, handling of sample containers, or sampling from contaminated fixtures can cause false “Present” results. These types of failures are rare, but can occur.
- Do nothing (not recommended, especially for Fecal failures): There are many people using private well waters with known total coliform contamination, that claim no adverse health effects. The idea that “if it was good enough for my grandparents, it is good enough for me” is still heard. A private well owner is not required by law to treat for bacteria or any other contaminants in their well water supply. While not recommended, if the decision is not to treat, routine follow up bacterial testing should be performed to ensure that no subsequent fecal contamination exists. No private well with fecal bacteria contamination should be used for household purposes, unless properly treated and subsequently tested.
- “Shock” well chlorination / disinfection: This process attempts to disinfect the well by introducing a strong chlorine solution to the well and house plumbing. Immediate success in the 80+% range can be expected. However, if the source of the contamination is the natural interaction of surface / shallow sub-surface waters with the well supply (most cases), long term success can be uncertain. Treatment by one-time shock chlorination should always be followed by regular follow up bacterial testing.
- Permanent water treatment: The goal of permanent treatment is to install equipment in the water system to kill or sterilize the bacteria, either at the well or as the water is pumped into the home. The two most common systems for residential applications are ultraviolet light systems and constant chlorination systems. Many other systems exist (ozone, hydrogen peroxide, reverse osmosis, etc.) but have disadvantages that outweigh the benefits for residential use in most situations.
 - Ultraviolet light (UV) systems: UV is the most common form of bacterial treatment in residential applications due to cost and ease of maintenance. However, UV systems have limitations. Poor quality incoming water and power failures are the most common causes of UV ineffectiveness. Manufacturers have established water quality parameters that must be tested prior to installation to ensure effectiveness. A properly designed UV system should include a method for stopping water flow in the event of a power failure. For these reasons, UV treatment is rated for, but is not recommended, for fecal bacteria failures.
 - Constant chlorination systems: Much like city water systems, the goal of constant chlorination is to introduce and maintain a disinfecting level of chlorine (or other disinfectant) into the well water system. Many designs are acceptable but introduction at the well head is preferred. A properly designed chlorination system should have the ability to remove (or limit) the chlorine from the water supply prior to use for household purposes. Chlorination (or other active disinfectant) systems are

recommended for fecal coliform treatment as they are much less susceptible to incoming water quality changes or intermittent power outages than UV systems.

Will my reverse osmosis (RO) system work for bacterial treatment?

RO membrane pore size is small enough to prevent passage of bacteria into the treated water supply in the short term. However, bacteria have been shown to cause RO membrane fouling and the ability to grow around membrane seals, limiting RO effectiveness in controlling bacteria over the long term. RO use for bacterial control is not recommended.

Are there any special considerations for real estate transactions?

Yes. Knowledge and communication is the key. In real estate transactions, it is important that the realtors, the buyers and the sellers clearly understand the meaning of the test results and that easy options exist to remedy. Total coliform failures are fairly common in private wells and treatment is generally straightforward and cost effective. Fecal failures are much less common, but just as with total coliform failures, treatment is straightforward. With proper communication, no home buying decision should be impacted by a failing coliform bacteria test result.

Who should I have design and treat my well water system?

The obvious answer would be GeoWater! However, we know there are other qualified professionals capable of designing and installing your treatment system. The important thing to know is that, by law, only licensed a Water Conditioning Contractor or Plumbing Contractor can design or install water treatment equipment. Please insist that any contractor you hire be licensed, pull permits and have follow-up inspections performed. Unfortunately there are many operators that are unlicensed and will not pull permits. Without the post-installation third party inspection, you have no assurance that the system is designed or installed properly.

These are general FAQs common to most bacterial test results. GeoWater staff is available to discuss the results and options to remedy your particular situation. Please feel free give us a call at 303-670-3348 if you have any additional questions, and thank you for your business!