Total Coliform Bacteria

There are a variety of bacteria, parasites and other organisms which can cause health problems when ingested in drinking water. Analyzing your water for each of these would be very expensive and difficult. Instead, public health agencies have chosen to measure for Total Coliform Bacteria (TCB). Total Coliforms are a group of bacteria, most of which are harmless, that are naturally present in the environment (soil and vegetation). Coliforms are not naturally occurring in groundwater and must have some source of entry into the well. Their presence indicates that disease-causing organisms could also be present in the water.

Your Test Results

When your water is tested for Total Coliform Bacteria, it is simultaneously tested for E. coli. If E. coli bacteria is found in your water sample, its presence will be indicated as "present" on your analytical report. The presence of E. coli indicates that the water has been in contact with human or animal waste (feces) and is an immediate risk to human health if consumed. Discontinue use of water until it can be treated. If any presence of bacteria is noted, the well should be disinfected.

There are many probable reasons why a water supply becomes contaminated. Perhaps you have done work on the pump or repaired a water line. Surface drainage could have influenced a shallow well. Your well may be too close in proximity to your septic system. Or, the seal on the well cap may be damaged. In any case, the water should be disinfected to eliminate all bacterial growth. Inspection of your water system is necessary to try to find the source of contamination; otherwise, a disinfection of your system will only be a temporary solution.

References

Disinfection Procedure for Coliform and Non-Coliform Bacteria in Groundwater Wells; MT Dept. of Environmental Quality, Source Water Protection, Helena, MT
http://deq.mt.gov/wqinfo/swp/default.mcpx

Groundwater and Drinking Water Frequently Asked Questions, USEPA
http://water.epa.gov/drink/info/well/faq.cfm

Household Water Use
http://waterquality.montana.edu/docs/homeowners.shtml

Well Water Information, Water Systems Council
http://watersystemscouncil.org/

Recommended Procedure for Chlorine Disinfection of Water Wells
http://denr.sd.gov/des/dw/disinfection.aspx#wells

Our Laboratories

Billings, MT	800.735.4489
Casper, WY	888.235.0515
College Station, TX	888.690-2218
Gillette, WY	866.686.7175
Helena, MT	877.472.0711

ENERGY LABORATORIES™

Trust our People. Trust our Data.

www.energylab.com

Shock Chlorination

of Your Private Well

A STEP-BY-STEP GUIDE

ENERGY LABORATORIES™

Trust our People. Trust our Data.

Shock Chlorination

of Your Private Well

Step 1

Using the Shock Chlorination Table, determine how much unscented household bleach (5.25% chlorine) is required based upon the diameter and depth of water in your well. Mix the bleach with clear water (up to 5 gallons) in a large container. Do not pour undiluted bleach into the well, as a high chlorine concentration may cause damage to the casing and/or pump. Check with your supplier for warranty information.

Step 2

Shut off the electrical power to the well. If you have equipment that may be damaged or affected by the bleach, such as RO systems, water softeners, etc., be sure to set those systems to "bypass".

Step 3

Remove the well cap. Carefully pour the chlorine solution down the well. Turn electrical power back on. Attach a clean hose to an outside spigot and run the hose into the well casing. Begin to circulate the water back down the well. Continue to recycle the water down the well until you can smell chlorinated water from the hose. This will ensure the chlorine solution has been thoroughly mixed in the well.

Step 4

Turn on all the cold water taps in the house one at a time. Let the water run until you can detect the odor of chlorine. Shut off all faucets.

Step 5

Leave the chlorine in the well and pipes for at least 24 hours to allow it to come into contact with the bacteria.
DO NOT USE THE WATER DURING THIS PERIOD!

Step 6

After 24 hours, turn on an outside faucet (avoid discharging large volumes of chlorinated water into the septic system) and flush the chlorinated water from the system until the chlorine smell is no longer present. Chlorinated water may be discharged to the ground surface, but it must not be allowed to make its way into any surface water, such as streams, rivers or ponds.

Step 7

72 hours after you are no longer able to detect chlorine in your system, collect a water sample using a laboratory sample kit to test for Total Coliform Bacteria. This sample should be taken to determine if the disinfection process was effective. If the lab report shows that the water is still unsatisfactory after disinfection, the disinfection process should be repeated until satisfactory results are obtained. If you are unable to resolve the unsatisfactory samples with a few disinfection efforts, it may indicate that there is a problem that needs to be identified and corrected, i.e., a cracked well casing or a cross-connection to the system. Contact a well professional or your county sanitarian for help in determining the problem. It is safe to use your water again when your water results are returned as "absent" for both Total Coliform and E. coli Bacteria.

SHOCK CHLORINATION FOR CISTERNS

Instructions for disinfecting a system with a cistern can be located on the Montana Department of Environmental Quality website:
deq.mt.gov/wqinfo/swp/Guidance/102_Disin.htm.

Shock Chlorination Table

Well Diameter (in inches)	Depth of Water in Well (ft)*								
	5	10	15	20	30	40	60	80	100
2	1C	1C	1C	1C	1C	1C	1C	1C	1C
3	1C	1C	1C	1C	1C	1C	1C	1C	2C
4	1C	1C	1C	1C	1C	1C	2C	2C	3C
5	1C	1C	1C	1C	1C	2C	3C	4C	1Q
6	1C	1C	1C	1C	2C	2C	4C	1Q	1.5Q
8	1C	1C	2C	2C	4C	1Q	2Q	2Q	2.5Q
10	1C	2C	3C	4C	1.5Q	2Q	3Q	3.5Q	4Q
12	1C	2C	4C	1Q	2Q	2.5Q	4Q	5Q	6Q
16	2C	1Q	2Q	2.5Q	4Q	4.5Q			
20	4C	2Q	2.5Q	3.5Q	5Q	7Q			
24	1Q	3Q	4Q						
28	2Q	4Q	5Q						
32	3Q	4Q	6Q						
36	3Q	6Q	2G						

Quantities listed as: C=Cup , Q=Quart, G=Gallon

**Note: Depth of water in well is measured from the static water level to the bottom of the well, or the actual height of the water in the well. See your well log or to manually measure water level, visit: http://www.ksre.ksu.edu/bookstore/pubs/mf2669.pdf*

Source: Manual of Individual and Non-Public Water Supply Systems, US EPA-Office of Water, EPA-570/9-91-004, May, 1991