FACTSHEET: BACTERIA

INTRODUCTION

This factsheet provides basic information for private water well owners regarding bacteria in their well water. To determine if water is generally safe to drink, water test results are compared to the US Environmental Protection Agency (EPA) **Primary Drinking Water Regulations** table of contaminants and the EPA **Secondary Drinking Water Standards**. The above standards only apply to public water systems, but the quality and health implications are the same for private well owners. In addition, the Wyoming Department of Environmental Quality (WDEQ) has a set of standards (Water Quality Rules and Regulations (WQRR) Chapter 8 Table 1) for water quality based on class of use, including domestic, agriculture and livestock. Keep your analytical results and your sampling documentation with your well information for future reference if there is a question about change in water quality.

WHAT ARE BACTERIA?

Bacteria are small organisms that occur naturally in the environment, and can be found almost everywhere on Earth. Most of the millions of bacteria that we come into contact with on a daily basis are harmless. Yet there are some bacteria, known as pathogens, that can cause water-borne illnesses, such as: Travelers' Diarrhea (enterotoxigenic Escherichia coli), Escherichia coli 0157:H7 (E. coli 0157:H7), Salmonellosis (Salmonella), Typhoid Fever (Salmonella Typhi), Dysentery (shigella), Cholera (Vibrio cholera), and Campylobacter (campylobacters). Many of these pathogens are closely associated with humans and warm blooded animals and are transmitted by direct contact or by contamination of food or water.

Common sources of bacteria can be sewage effluent from sewers, septic systems, feedlots, or animal holding areas. Bacteria can also enter a well or the distribution system during construction. Many of these pathogens, if present, can enter groundwater right at the wellhead. Proper well installation methods, well construction, disinfection procedures, and well siting can reduce the potential for bacterial contamination of your well or distribution system.

Total coliform bacteria are one group of mostly harmless bacteria that can be found in water, soils, and the intestines of animals. Total coliform bacteria can be a potential indicator of the presence of more harmful bacteria.

IS THERE A WATER QUALITY STANDARD FOR BACTERIA?

If a water sample tests positive for total coliform bacteria, the water should then be tested for fecal bacteria or E. coli. EPA has not set a Maximum Contaminant Level (MCL) for total coliform bacteria since they are used as an indicator of other potential harmful bacteria. The EPA has set an MCL for E. Coli bacteria as a positive test result (meaning E. coli bacteria are

present). EPA has additional information online regarding the Total Coliform Rule. EPA does not have standards for the other potential disease causing bacteria previously mentioned.

Water Quality standards for bacteria are not listed in WQRR Chapter 8, Table 1.

WHAT ARE SYMPTOMS OF BACTERIA IN MY WATER? WHAT ARE THE HEALTH EFFECTS?

With some exceptions a bacterial infestation may not exhibit telltale signs such as staining of kitchen or bathroom fixtures, odors, or slime development.

If anyone in your household suffers from recurring bouts of gastrointestinal illnesses (e.g. nausea, vomiting, diarrhea) you should have your well tested. Disease-causing bacteria can be life threatening to infants, children, the elderly and/or those with a compromised immune system.

If you suspect well contamination or experience illness, stop drinking or cooking with the water, and do not resume use until testing has shown the water to be safe.

HOW DO I TEST FOR BACTERIA IN MY WATER?

If you suspect you may have bacteria in your well water, a list of certified labs can be found on the WDEQ Know Your Well Webpage (deq.wyoming.gov/wqd/know-your-well). Contact your selected laboratory for testing procedures and sample bottles.

You should test your well **annually** for bacteria (usually in the spring), if you have noticed any changes in your water, or if any of the following has occurred:

- Anyone in your household suffers from recurring bouts of gastrointestinal illnesses
- An infant is living in the house or anyone is pregnant
- Flooding of the wellhead area has occurred
- You are purchasing a home
- New well equipment has been installed or maintenance on the well has been performed
- Landscaping or ground disturbance near the wellhead has occurred

CAN BACTERIA ISSUES BE PREVENTED?

The best protection is preventing bacteria from getting into your well during construction or maintenance, and by making sure your well and septic system are properly constructed and maintained. The following steps can be taken to help minimize the introduction of bacteria to your well:

- Use disinfected water during drilling, repair, priming or maintenance of pumps. Never use surface water.
- Ensure that your wellhead is watertight, properly capped, and sticks up above ground at least 12-inches.
- When equipment is removed from the well, it should be placed on a clean dry drop cloth and not the bare ground.
- Disinfect the well, pump and plumbing anytime work is done on the well or well equipment
- Install a back-flow preventer on your pump

WHAT CAN BE DONE TO CONTROL BACTERIA PROBLEMS?

The information below is intended as an information source only. The WDEQ suggests you discuss appropriate water treatment options with a qualified water treatment specialist, since other constituents in your water may affect the selection of the appropriate water treatment method.

Disinfection procedures are the only procedures useful for removing harmful bacteria from water. Filtration systems or anion exchange are

not effective. Common treatments for bacterial problems are:

- Chlorine
- Iodine
- Ultra-violet (UV) light
- Ozone

Any disinfection procedure, such as shock chlorination, may only be useful if the underlying cause of the bacterial contamination has been eliminated. Treatment systems, such as chemical dispersing systems and UV units, require regular maintenance. Your water should be tested regularly to monitor the performance of the treatment system.

NOTE: Care should be taken when using chlorination in areas where Arsenic may be an issue. Chlorine can cause chemical reactions that may release arsenic from the surrounding geologic material.

REFERENCES

American Ground Water Trust, *Public Information Pamphlet #10, Bacteria and Water Wells* https://agwt.org/content/bacteria

United States Environmental Protection Agency, September 2013, *Revised Total Coliform Rule (RTCR): A Quick Reference Guide*

United States Geological Survey, Michigan Water Science Center, January 2017, *Bacteria and Their Effects on Ground-Water Quality*

Water Systems Council, Wellcare®, August 2016, Information for you about Bacteria & Well Water