

Shock Chlorination - Well Maintenance

Shock chlorination is a relatively inexpensive and straightforward procedure used to control bacteria in water wells. Many types of bacteria can contaminate wells, but the most common are iron and sulfate-reducing bacteria. Although not a cause of health problems in humans, bacteria growth will coat the inside of the well casing, water piping and pumping equipment, creating problems such as:

- Reduced well yield
- Restricted water flow in distribution lines
- Staining of plumbing fixtures and laundry
- Plugging of water treatment equipment
- "Rotten egg" Odor.

Bacteria may be introduced during drilling of a well or when pumps are removed for repair and laid on the ground. However, iron and sulfate-reducing bacteria (as well as other bacteria) can exist naturally in groundwater.

A well creates a direct path for oxygen to travel into the ground where it would not normally exist. When a well is pumped, the water flowing in will also bring in nutrients that enhance bacterial growth.

Note: All iron staining problems are not necessarily caused by iron bacteria. The iron naturally present in the water can be the cause (see Module 12 "Other Resources" for more information.)

Ideal Conditions for Iron Bacteria

Water wells provide ideal conditions for iron bacteria. To thrive, iron bacteria require 0.5-4 mg/L of dissolved oxygen, as little as 0.01 mg/L dissolved iron and a temperature range of 5 to 15 °C. Some iron bacteria use dissolved iron in the water as a food source.

Signs of Iron and Sulfate-Reducing Bacteria

There are a number of signs that indicate the presence of iron and sulfate-reducing bacteria. They include: Slime Growth, Rotten Egg Odor and Increased Staining.

Slime Growth

The easiest way to check a well and water system for iron bacteria is to examine the inside surface of the toilet flush tank. If you see a greasy slime or growth, iron bacteria are probably present. Iron bacteria leave this slimy by-product on almost every surface the water is in contact with.

Rotten Egg Odor

Sulfate-reducing bacteria can cause a rotten egg odor in water. Iron bacteria aggravate the problem by creating an environment that encourages the growth of sulfate-reducing bacteria in the well. Sulfate-reducing bacteria prefer to live underneath the slime layer that the iron bacteria form. Some of these bacteria produce hydrogen sulfide as a by-product, resulting in a "rotten egg" or sulfur odor in the water. Others produce small amounts of sulfuric acid which can corrode the well casing and pumping equipment.

Increased Staining Problems

Iron bacteria can concentrate iron in water sources with low iron content. It can create a staining problem where one never existed before or make an iron staining problem worse as time goes by. Use the following checklist to determine if you have an iron or sulfate-reducing bacteria problem. The first three are very specific problems related to these bacteria. The last two problems can be signs of other problems as well.

Checklist to Determine an Iron or Sulfate-Reducing Bacteria Problem

- Greasy slime on inside surface of toilet flush tank
- Increased red staining of plumbing fixtures and laundry
- Sulfur odor
- Reduced well yield
- Restricted water flow

Do It Yourself - Shock Chlorination Procedure

1. Store enough water to meet household and farm water needs.
2. Bypass any conditioning, iron and or carbon filter system.
3. Fill 200-300gal water tank using your well water.
4. Dissolve the calcium hypochlorite (granular form of chlorine) into 5 gal pail of water. Once the chlorine is dissolved, pour into the tank.
5. Attach provided hose to the tank, take cap off well, place other end of hose into the well, (gently pull out the excess wire that may be in the way, but DO NOT pull up on a gray cable, that cable if pulled, will release the pump from the pitless adaptor.
6. Once hose is in the well, turn the lever on the tank and allow the water to flow slowly into the well.
7. Once tank is empty, leave the chlorine mixture in the well for a minimum of 8 hours.
8. After 8 hours, run the water in your distribution system until you smell the chlorine, then turn off faucets.
9. Attach garden hose and run the water slowly from the well, away from septic field, mound, tanks and let it run until the smell of chlorine disappears. (Tip: Running water from hose for an hour or so, then turning it off for 15 mins then run it again. Repeat this procedure until water is free of chlorine.
10. Open each tap in the distribution system and let it run until the smell of chlorine disappears. Your water may be dirty for awhile. The more water you use, the faster it will clean up.
11. Return your filtration, conditioning equipment from bypass.

The purpose of Shock Chlorination is to keep your water well and water system clear of bacteria. This procedure should be repeated at least once a year.

CALCIUM HYPOCHLORITE IS VERY CORROSIVE, PLEASE WEAR PROTECTIVE GLOVES, FACIAL MASK AND EYE SAFETY GLASSES. MATERIAL SAFETY DATA SHEET IS ATTACHED FOR YOUR INFORMATION AND SAFETY.

DO NOT LEAVE THE GARDEN HOSE RUNNING IF YOU PLAN ON BEING AWAY. MONITOR THE FLOW OF THE WATER IN ORDER THAT YOU DO NOT OVER PUMP THE WELL.

We are not responsible for any damages that may occur while doing this shock chlorination procedure.

Westar Water Well Drilling

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