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Disinfection of your Water System

- If your water analysis report indicated that your water supply has bacterial contamination, you should disinfect or "shock" your well.
- Newly constructed wells and any water system that has been serviced should be disinfected prior to use or reuse.
- Some types of water treatment devices, such as activated carbon filters or water softeners should be disconnected or removed during disinfection as highly chlorinated water can exhaust the media, as well as, damage gaskets. Refer to the instruction manual or contact the manufacturer or purveyor.
- This disinfection procedure will render your water system unusable until the disinfectant bearing water is run out. The procedure typically requires one day. If the residence is to be occupied through the disinfection, a supply of bottled water should be available for consumption, hygiene and cleaning.
- When performing a water system disinfection, it is important not to run the well dry or stress the pump or pressure tank. If the water pressure significantly diminishes, turn off the water and let the well recover and the pressure tank rebuild pressure. Sediment filters may also clog and require replacement to restore pressure, as sediment in the well is stirred up and minerals are oxidized.

DETERMINE WHAT DISINFECTION AGENT TO USE

- Dug or Drilled (Artesian) wells of moderate depth
  - Use a chlorine bleach solution (5.25% hypochlorite, e.g., Clorox)
  - Liquid shock chlorine may also be used. If the liquid shock is about 15% concentration, then reduce the amount by ½ as compared to conventional Clorox.
- Drilled wells of depths in excess of 200' to 400'
  - Use granulated or solid tablet calcium hypochlorite (containing about 65% to 95% available chlorine by weight) rather than household bleach. This product will drop to the bottom of the well, when mixing of the water column cannot be achieved.
- For an overflowing spring, use the fast-dissolving calcium hypochlorite tablets
- **CAUTION**: **Check the labels of hypochlorite containers or inquire as to the products content and application. The product should contain ONLY a hypochlorite active ingredient, no fungicides, algaecides or other disinfectants that may be acceptable for use in swimming pools, but are not safe to add to drinking water.**

CALCULATE THE VOLUME OF WATER IN YOUR WELL

- Artesian (Drilled) well
  - Drilled wells typically have a 6" casing and contain about 150 gallons per 100 feet of water (1.5 gallons/foot of casing height). Don't forget to subtract the unfilled portion of the casing from your calculation.
- Dug well
  - Number of gallons = Diameter (in feet) x Diameter (in feet) x 5.9 x depth of water in well (in feet)
  - For example: If the diameter of your well is 3 feet and the depth of water is 15 feet, the calculation would be: 3 x 3 x 5.9 x 15. (3 x 3 = 9 x 5.9 = 53.1 x 15 = 796.5 gallons of water in well)
  - Approximate volume based on diameter of well:

Well diameter:	Gallons or water / feet of water column:
2	24
3	53
4	94
5	147

DETERMINE THE QUANTITY OF DISINFECTANT

- For liquid bleach: 1 gallon of bleach per 525 gallons of water in your system.
- Calcium hypochlorite tablets: 3 oz. for every 100 gallons of water
  - Put tablets in a heavy bag and break them up with a hammer into marble sized pieces. Handle the material with care; it is hazardous in its concentrated form. Use protective gloves and a dust mask or respirator to prevent contact and inhalation.
  - Alternative to crushing: Add tablets to 1 or 2 gallons of water to allow it to partially dissolve prior to adding to the well. When possible, add the solution as the well is refilling.

DISINFECTION PROCEDURE

- If possible, draw the water level in the well down by running a faucet or spigot. Do not let the well run dry.
- Bypass any water filters and water treatment devices if required. Be advised that highly chlorinated water may damage gaskets in pressure tanks, holding tanks and hot water heaters.
- Bring a hose, a bucket and the disinfectant to the wellhead and remove the well cap. If there is evidence of insect activity under the well cap, the cap should be replaced to prevent a reoccurrence of bacterial contamination.
- Add the disinfectant to the well as it is refilling. Add a couple cups of bleach to 4 - 5 gallons of water in a bucket and pour into the well, letting the solution run down the inner casing of the well. When using solid hypochlorite, add tablets to a couple gallons of water and allow them to partially dissolve prior to pouring into the well. Repeat until all of the required disinfectant has been added to the well.
- Run the hose directly into the well. Cycling the water will help disinfect the well casing and aid in mixing the solution in the water column.
- After the addition of the disinfectant, keep a faucet running and wait until a strong odor of chlorine can be detected. Chlorine test strips can be used in aiding the detection of the disinfectant. Depending on the depth of the water column and the recharge rate of the well this can take up to three hours. If little or no odor is detected, more chlorine may be required.
- Once the disinfectant has been detected within the distribution system, the well can be capped and the disinfectant must be run through every line in the system. Once the disinfectant is detected at a given faucet, it may be turned off and the next faucet run until the disinfectant is detected. Be sure to run the disinfectant through every line, this includes hot and cold water faucets, showers, toilets and sill cocks, as well as, the washing machine and dishwasher.
    - It will require additional time for the disinfectant to be detected in the hot water as the contents of the tank need to be turned over once for the disinfectant to enter the hot water lines. The hot water heater can be turned off to conserve energy.
- Turn all the faucets off and keep the disinfectant in the system for 8 - 24 hours, depending on the strength of the disinfectant solution in the system. Typically this is accomplished by leaving the disinfectant in the system overnight.
- To remove the disinfectant use a hose to discharge the water until the chlorine is undetectable. This may take up to several hours or all day. Do not drain highly chlorinated water onto a lawn, garden, or into the septic system. Discharge superchlorinated water onto a safe area such as a graveled driveway, wood line, or ditch. Do not allow the chlorinated water to reach a other surface waters so as to avoid a fish kill.
- If diminished water pressure is observed, flush at less than full flow or intermittently close the tap, allowing the water system to recover before continuing to flush, so as to avoid seizing the pump and/or running the well dry.
- Upon purging all the disinfectant bearing water from the well and the pressure or holding tanks, turn on inside faucets to remove the disinfectant from the remaining lines in the distribution system.
- Resample the water for bacteria, waiting at least one week after the chlorine odor has disappeared.
- Two or three consecutive bacteria-free tests yield greater confidence that the problem has been corrected.
- If tests show the continued presence of coliform bacteria, the procedure should be repeated. If a second shock chlorination of the system does not correct the problem, a well driller, plumber, hydrogeologist or engineer should be consulted.