CAUTION

- During the seven- to 13-hour procedure, purchase water for drinking, cooking and laundry. Do not use well water for drinking or cooking while chlorine level is exceptionally strong.
- All concentrated chlorine solutions are corrosive and care should be taken to avoid splashing them onto skin or into eyes. Skin areas or eyes contacted by the disinfection solution should be flushed immediately with clean water.
- Never mix chlorine solutions with compounds containing acids or ammonia to improve their cleaning ability because toxic gases will form.

Glossary

Contaminant: Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

Disinfection: Killing a larger portion of the harmful and objectionable bacteria in water.

Groundwater: Water that fills wells from aquifers (natural reservoirs below the earth's surface).

Resample: Any water sample taken after the initial sampling of a well.

Sample: Water that is analyzed by a laboratory for the presence of drinking water contaminants.

Shock chlorination: Adding chlorine to water for the purpose of disinfection or other biological or chemical results.

Well: An artificial excavation constructed for the purpose of exploring for or producing ground water.

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COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

LABORATORY SERVICES DIVISION

Shock Chlorination of Wells and Water Systems

CHEMISTRY LABORATORY
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Determining Amount of Chlorination for Your Well

Table I

Casing Diameter (Inches)	Gallons of Water in 1 Foot of Casing	Casing Diameter (Inches)	Gallons of Water in 1 Foot of Casing
2	0.16	18	13.21
4	0.65	24	23.50
5	1.02	30	36.72
6	1.47	36	52.87
8	2.61	42	71.97
10	4.08	48	94.00
12	5.88		

Table II

Gallons of Water in Well	Laundry Bleach	Chlorinated Lime	High Test Hypochlorite
5	5.5 oz.	1.2 oz.	.5 oz.
50	56 oz.	12 oz.	4 oz.
100	112 oz.	24 oz.	8 oz.
150	168 oz.	36 oz.	12 oz.
200	224 oz.	48 oz.	16 oz.
300	336 oz.	72 oz.	24 oz.
Each addtional 100 gallons add:	112 oz.	24 oz	8 oz.

Bacterial contamination of well water can come from many sources. The most common include repairing the pump or casing without follow-up chlorination, surface water entering pump or casing, poor construction of the well, or leaks in the well or well casing.

Shock chlorination of the well may eliminate the bacterial contamination, but well rehabilitation may be necessary if contamination continues to occur (as in a rusted or leaking casing).

To determine the amount of chlorine needed to shock chlorinate your well, first determine the approximate volume of water contained in your well. Determine the volume of water in your well by multiplying the depth of your well times the amount of water in one foot of casing (Table I).

Well Depth x Gallons of Water in 1 Foot of Casing (see Table I) = Volume of Water in Well

Once you have determined the volume of water in your well, refer to Table II to determine the amount of chlorine compound required to shock chlorinate your well.

Forms of Chlorine Used in Shock Chlorination

Format	Chemical Mixture
Liquid	Laundry Bleach (Sodium Hypochlorite, 5.25%)
Powder or Tablet Form	Chlorinated Lime (Chloride of Lime, 25-30%)
Powder or Tablet Form	High-Test Hypochlorate (Calcium Hypochlorite, 65-75 %)

Treatment of Casing and Drop Pipe

During the shock chlorination process it is necessary to thoroughly wet down the inside of the well casing and drop pipe. This can be accomplished by one of the three methods mentioned below:

- If liquid bleach is used, mix the recommended amount (Table II) to at least 10 gallons of water. Pour down the inside of the casing, thoroughly wetting down everything inside the casing.
- If powdered or tablet chlorine is used, dissolve the recommended amount (Table II) in a small quantity of water, then add the clear solution to a larger quantity of water (at least 20 gallons). Pour this solution into the casing, thoroughly wetting down everything inside the casing.
- If a hose will extend from a nearby hydrant or faucet to the well casing, pour the recommended amounts of chlorine (Table II) into the casing and wash down the inside of the casing with the hose. Make sure the chlorine solution in the well is coming through the hose during the wash-down procedure. Pumping the solution into the casing will help to mix the chlorine solution with the standing water in the well.

Once the chlorine is thoroughly mixed with the water in the well casing, allow it to stand for about six to12 hours. At the end of the six- to12-hour period, all faucets should be allowed to run until a strong odor of chlorine is observed at each faucet, then turn off the faucets and allow the water to stand in the pipes for one hour.

Flushing the System

Begin flushing the system by running all outside faucets until you no longer smell chlorine. Run this water into the street or onto an area where there is no lawn or flowers, such as a rocked area. You may severely damage lawns, landscape plantings, flowers or septic tanks with heavily chlorinated water.

Once you have removed most of the chorine at the outside faucets, go into the house and run all inside faucets. If you have a septic tank or leaching field, you may want to dechlorinate the water at the drain by using approximately two (2) ounces of sodium bisulfite for every gallon run. Sodium bisulfite can be purchased at hardware stores.

Hot water heaters should be drained after a well is treated with chlorine. If possible, run a hose from the water heater outside to an area that does not contain lawn or other sensitive plants.

CAUTION
- Do not flush more than 100 gallons of chlorinated water from the system into the septic system.
- Avoid draining heavily chlorinated water to lawns and do not allow puddles to form.
- Do not chlorinate carbon or charcoal filters because this will deplete their capacity.