Well Disinfection

By Doug Osburn, Training Specialist

Every year we get a few calls wanting to know how to disinfect a well and how to calculate how much chlorine to use for a desired chlorine residual. Wells need to be disinfected when they are new before they are put into service, after well maintenance when the pump has been removed and reinstalled, and if they become contaminated for whatever reason. Small Water System Operation and Maintenance manual from California State University has a section on wells and a good guide for disinfecting wells. The manual has a quick guide table for amounts of both calcium hypochlorite and sodium hypochlorite for different sizes of well casing. They are all based on 100 feet of water in the casing and 50 mg/l chlorine residual.

Casing Diameter	Calcium Hypochlorite 65%	Sodium Hypochlorite5.25%
6 inch	**2 ounces**	**20 ounces**
8 inch	**3 ounces**	**2 1/8 pints**
10 inch	**4 ounces**	**3 ½ pints**
12 inch	**6 ounce**	**5 pints**

This is based on the pounds formula and I'll explain how this works:

Volume in million gallons X concentration in mg/l X 8.34 lbs/ gallon.

Let's say you need to chlorinate a 6 inch well with 100 feet of water, this will allow you calculate the volume part of the formula.
Area in square feet = Diameter squared times .785 (1/4 pi), 6in. diameter is equal to 0.5 ft. so 0.5 X 0.5 X .785 = 0.1963 sq.ft.
Volume in cubic feet= area x height or 0.1963 sq.ft. X 100 ft = 19.63 cu. ft.
Volume in gallons= 19.63 cu.ft. X 7.48 gallons/cu.ft.= 146.8 gallons
Volume in Million Gallons = 146.8 gallons/ 1,000,000 = 0.0001468 MG. now we can work this.
0.0001468MG X 50mg/l X 8.34lbs/gallon = 0.062lbs at 100% strength.

Only chlorine gas is 100% and granulated calcium hypochlorite usually is 64-65% strength. Sodium hypochlorite is commonly at 12.5% and household bleach is 5.25%. Any of these you choose to use, it should be NSF (National Sanitation Foundation) approved.

If you need 0.062lbs of 100% chlorine and you choose to use 65% calcium hypochlorite you need to convert so you get the right amount and this is how to convert this:

0.062 divided by 0.65 = 0.0954lbs of 65% strength. To convert this to ounces you take 1 pound = 16 ounces, 16 ounces divided by 0.0954 = 1.53 ounces and as you can see in the table, they rounded up to 2 ounces. It's better to have a little too much than not enough. Remember if you are dealing with a product that is less than 100%, the volume will always be more than the 100% amount.

If you need a residual of 100mg/l all you need to do is double the amount of calcium hypochlorite, if your well is contaminated it is recommended to chlorinate at 200mg/l so just double the 100mg/l amount. All of the disinfections need to last 24 hours before flushing.

When using dry ingredients such as calcium hypochlorite you mix with water and make a solution to aid in the mixing of the water in the well. After letting the well sit idle for 24 hours you need to flush until no residual is detected. Next, using a sterile container, pull a sample and send it to the lab for analysis. After you get good lab results you can put the well back into operation. If the sample comes back hot or positive, you need to repeat the disinfection process.

If you need assistance with this or any other procedure call our office at 503-873- 8353 and schedule a visit from one of our field staff.