

Shock Chlorination of Water Wells

adapted from "WATER WELLS...that last for generations", copyright 1996

Shock chlorination is a do-it-yourself 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 pipelines
- red staining of plumbing fixtures and laundry
- plugging of water treatment equipment
- 'rotten egg' odour

To be effective, shock chlorination must disinfect the entire cased section of the well, the adjacent water-bearing formation and the entire water distribution system. This procedure does not completely eliminate the bacteria growth but will help control the problem. Repeat the procedure each spring and fall as a regular maintenance procedure.

Shock Chlorination Procedure for Drilled Wells

Step 1 Store sufficient water to meet farm and family needs for 8 to 48 hours.

Step 2 Pump the recommended amount of water (see Table 1) into clean storage. A clean galvanized stock tank or pickup truck box lined with a 4 mil thick plastic sheet is suitable. The recommended amount of water to use is twice the volume of water present in the well casing. To measure how much water is in the casing, subtract the non-pumping (static) water level from the total depth of the well.

Step 3 Calculate the amount of chlorine that is required, as shown in Table 1. Mix the chlorine with the previously measured water to obtain a 1000 ppm chlorine solution.

Step 4 Siphon this solution into the well.

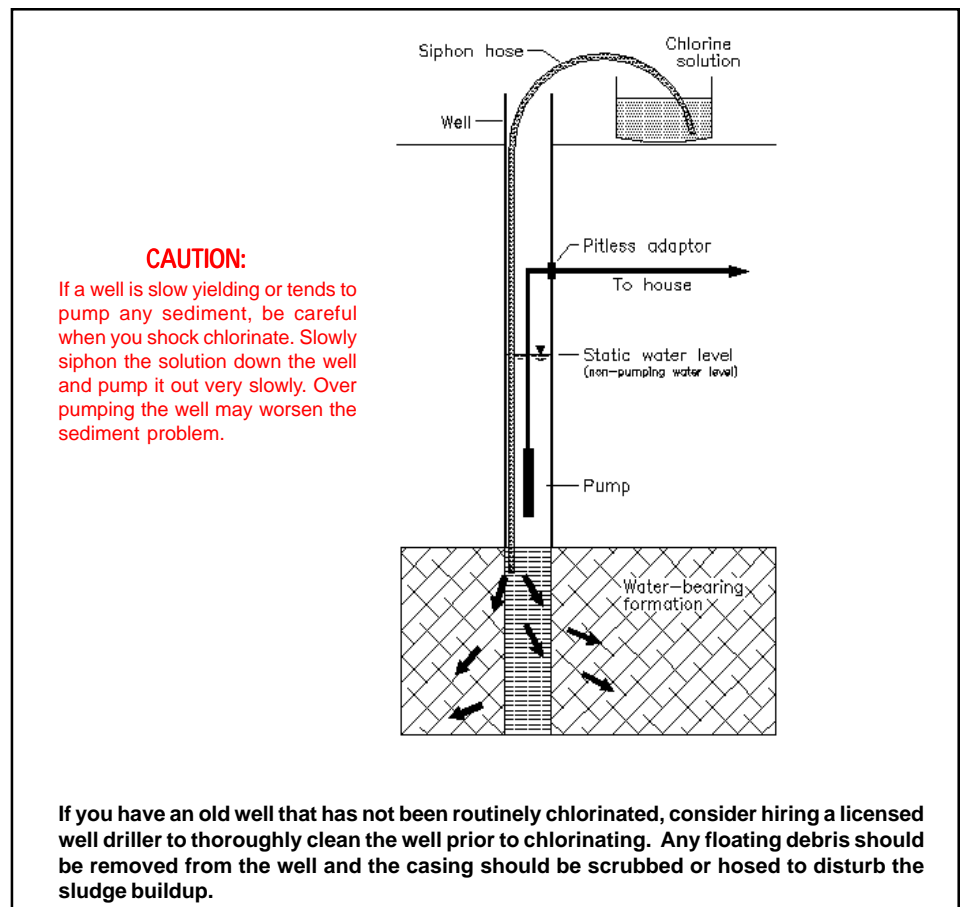
Step 5 Open each hydrant and faucet in the distribution system (including all appliances that use water such as dishwasher, washing machine, furnace humidifier) until the water coming out has a chlorine odour. This will ensure all the plumbing fixtures are chlorinated. Allow the hot water tank to fill completely. Consult your water treatment equipment supplier to find out if any part of your water treatment system should be bypassed, to prevent damage.

Step 6 Leave chlorine solution in the well and distribution system for 8 to 48 hours. The longer the contact time, the better the results.

Step 7 Open an outside tap and allow the water to run until the chlorine odour is greatly reduced. Make sure to direct the water away from sensitive plants or landscaping.

Step 8 Flush the chlorine solution from the hot water heater and household distribution system. The small amount of chlorine in the distribution system will not harm the septic tank.

Step 9 Backwash and regenerate any water treatment equipment.



If you have an old well that has not been routinely chlorinated, consider hiring a licensed well driller to thoroughly clean the well prior to chlorinating. Any floating debris should be removed from the well and the casing should be scrubbed or hosed to disturb the sludge buildup.

Table 1
Amount of Chlorine Required to Obtain a Chlorine Concentration of 1000 ppm

Casing Diameter		Volume of Water Needed		5 ¼% Domestic Chlorine Bleach	12% Industrial Sodium Hypochlorite	*70% High Test Hypochlorite
		Water needed per 1 ft. (30 cm) of water in the casing		L needed per 1 ft. (30 cm) of water	L needed per 1 ft. (30 cm) of water	Dry weight* per 1 ft. (30 cm) of water
(in)	(mm)	(gal.)	(L)	(L)	(L)	(g)
4	(100)	1.10	5.00	0.095	0.042	7.20
6	(150)	2.40	10.90	0.210	0.091	15.60
8	(200)	4.20	19.10	0.360	0.160	27.30
24	(600)	**extra 200 gal.	**extra 1000 L	1.700	0.740	127.00
36	(900)	**extra 200 gal.	**extra 1000 L	3.800	1.700	286.00

* Since a dry chemical is being used, it should be mixed with water to form a chlorine solution before placing it in the well.

** See modified procedure for large diameter wells

Imperial Example

The drilling record indicates the casing is 200 ft. in length and the non-pumping ("static") water level is 100 ft. The length of casing that is holding water in it is 100 ft. (200-100). If your casing is 6 inches in diameter you need to pump 2.40 gal. of water for every foot of water in the casing, into your storage container. Since you have 100 ft. of water in the casing, you will pump 2.40 gal./ft. x 100 ft. = 240 gal. of water into storage.

Using Table 1,
calculate how much water you need to pump into clean storage.

Casing diameter _____ **needs** _____ **gal./ft. x** _____ **ft. =** _____ **gal.**

Calculating Amount of Chlorine Example

If your casing is 6 inches and you are using 12% industrial sodium hypochlorite, you will require 0.091 L per ft. of water in the casing. If you have 100 ft. of water in the casing, you will use 0.091 L x 100 ft. = 9.10 L of 12% chlorine.

Using Table 1,
calculate the amount of chlorine you will need for your well.

Casing diameter _____ **Chlorine strength** _____

L needed per 1 ft. of water _____ **x** _____ **ft. of water in casing =** _____ **L of chlorine**

Modified Procedure for Large Diameter Wells

Step 1 Pump 200 gal. (1000 L) of water into a clean storage tank at the well head.

Step 2 Mix 20 L of 5 ¼% domestic chlorine bleach (or 8 L of 12 % bleach or 1.4 kg of 70 % calcium hypochlorite) into the 200 gal. of stored water. This mixture will be used later in Step 5.

Step 3 Using Table 1, calculate the amount of chlorine you require per foot of water in the casing and add directly into the well. (Note: the 70% hypochlorite powder should be mixed with water to form a solution before placing into the well).

Step 4 Circulate chlorine added to the water in the well by hooking a garden hose up to an outside faucet and placing the other end back down the well. This circulates the chlorinated water through the pressure system and back down the well. Continue for at least 15 minutes.

Step 5 Siphon the 200 gal. bleach and water solution prepared in Steps 1 and 2 into the well.

Step 6 Complete the procedure as described in Steps 5 to 9 for drilled wells.

CAUTION:
Chlorine is corrosive and can even be deadly. If your well is located in a pit, you must make sure there is proper ventilation during the chlorination procedure. Use a licensed well driller who has the proper equipment and experience to do the job safely.

