Responsibility for Well Abandonment

A well must be permanently abandoned or repaired if it acts as a source or channel of contamination. The well owner is responsible for having the well permanently abandoned if it is required except in the following situations:

(a) the Well Contractor must abandon the well if they have not installed the casing in the well or have removed the casing from the well;

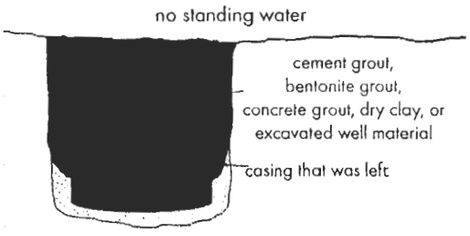
(b) the Well Contractor must abandon the well if it is required because the driller improperly located, constructed, repaired or completed the well; or

(c) the person who installed, removed or repaired the pump must abandon the well if it is required due to improper pump installation, removal, or repair. (15A NCAC 2C .0113 (e) (2))

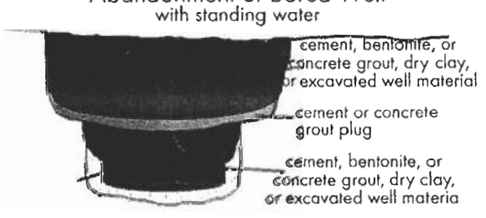
Any person abandoning a well must submit a record of abandonment (form GW-30) to the Groundwater Section within 30 days after completion. The procedures for abandonment apply regardless of the age of the well or length of time the well has been used. A certified well contractor must be used to abandon all wells in North Carolina. However, the well owners may abandon their own well if done in accordance with 15A NCAC 2C .0100.

There are two major categories of wells: **Drilled Wells** are usually 2-10 inches in diameter, have steel or thermoplastic casing and are typically "punched" or drilled into unconsolidated sediments or consolidated bedrock. **Bored Wells** are usually 18-36 inches in diameter, have clay or concrete casings and usually are hand dug, or bored with a large diameter power auger into unconsolidated sediments or weathered bedrock. The requirements for well abandonment are different for these two well types.

Abandonment of Bored Well
no standing water



Abandonment of Bored Well
with standing water



Bored Well Abandonment

For bored wells that do not have standing water in them at any time during the year:

(a) remove all plumbing or piping, along with any obstructions in the well;

(b) remove as much of the well casing as possible; then

(c) fill the entire well up to land surface with cement grout, bentonite grout, concrete grout, dry clay, or material excavated during construction of the well and then compacted in place.

For bored wells that do have standing water in them during any part of the year:

(a) remove all plumbing, piping or obstructions;

(b) disinfect the well using a solution made from calcium hypochlorite containing 65%-75% available chlorine and following the requirements of Title 15A NCAC 2C .0111;

(c) remove as much of the well casing as possible, but no less than 3 feet below land surface;

(d) remove all soil or other subsurface material present down to the top of the remaining well casing and extending to a width of at least 12 inches outside of the well casing;

(e) fill the well to the top of the remaining casing with cement grout, concrete grout, bentonite grout, dry clay, or material excavated during construction of the well and then compact in place;

(f) pour a 1 foot cement or concrete grout plug that fills the entire excavated area above the top of the casing, including the area extending on all sides of the casing out to a width of at least 12 inches on all sides; then

(g) complete the abandonment process by filling the remainder of the well above the plug with additional concrete grout, cement grout or soil.

Drilled Well Abandonment

Any casing not grouted must be removed or properly grouted. Casing that is grouted can be removed if such removal does not contribute to contamination of the groundwater.

The entire depth of the well has to be sounded to ensure freedom from obstructions that may interfere with sealing operations.

The well should be disinfected using a solution made from calcium hypochlorite containing 65% - 75% available chlorine, such as HTH. Do not use calcium hypochlorite products containing fungicides, algicides, or other disinfectants. Do not use a common household bleach, as it is too weak. A complete description of disinfection procedures can be found in Title 15A NCAC 2C .0111

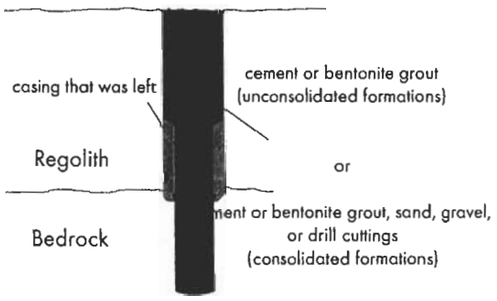
If the well is gravel-packed and the casing and screen have not been removed, neat cement or bentonite grout must be injected into the well, completely filling it from the bottom of the casing to the top of the well.

Wells constructed in unconsolidated formations shall be completely filled with cement

grout or bentonite grout by introducing it through a pipe extending to the bottom of the well. The pipe is then raised as the well is filled (commonly called a tremmie pipe).

Wells constructed in consolidated formations may be filled with cement grout, bentonite grout, sand, gravel, or drilling cuttings up to 10 feet below the top of consolidated rock or 5 feet below the bottom of the casing. The remaining well void space must be filled with cement or bentonite grout to the top of the well or land surface.

Abandonment of Drilled Well



Other Wells

This pamphlet has summarized the abandonment procedures for water wells. However, there are many other types of wells in North Carolina that must be abandoned properly. For Injection Well abandonment procedures, refer to the Title 15A NCAC 2C .0200 rules: Criteria and Standards Applicable to Injection Wells. For monitoring wells and other miscellaneous wells, refer to Title 15A NCAC 2C .0100: Criteria and Standards Applicable to Water Supply and Certain Other Wells.

Well Disinfection Tip

The following table can be used to determine how much chlorine compound is needed to dose 100 feet of a water filled well to at least 100mg/l.

Borehole or Casing Diameter (inches)	Gallons of Water per 100 ft of Water Filled Well	Amount of Calcium Hypochlorite (65%-70% available chlorine)
2	16.3	0.5 oz.
4	65.3	2 oz.
6	146.9	4.4 oz.
8	261.1	7.8 oz.
10	408	12.2 oz.
12	587	1 lb.2 oz.
18	1321	2 lb. 8 oz.
20	1632	3 lbs. 1 oz.
24	2350	4 lbs. 7 oz.
30	3672	6 lbs. 14 oz.
36	5287	9 lbs. 15 oz.

If you have additional questions, please contact the Groundwater Section Regional Office in your area for more information on well disinfection.

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