

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

Texas

WELL DECOMMISSIONING

(No.)

Code 351

1. SCOPE

The work consists of recording well data; preparing the well site for sealing and permanent closure including the removal of pumping equipment and piping, removable casing and screens, obstructing materials, trash, debris, and existing surface materials; disinfecting the well; providing and installing well sealing materials; and shaping the well area.

This specification does not cover the capping of a non-deteriorated well. A non-deteriorated well contains casing in good condition and is beneficial to the landowner.

2. PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be public or private, overhead and underground power or communication lines, and any pipelines. The landowner\operator\contractor must conduct their own search and discovery for utilities in order to lesson or avoid potential damages. During planning, the owner\operator must complete a TX-ENG-80A, UTILITIES INVENTORY to document known utilities. The owner\operator or their representative must complete TX- ENG-80B, COOPERATOR CONFIRMATION OF THE ONE-CALL UTILITY SAFETY SYSTEM to comply with State law prior to any ground disturbance and return it to a USDA-NRCS representative.

3. QUALITY CONTROL

Quality control of all materials and construction procedures is the responsibility of the landowner and contractor. USDA-NRCS will make periodic review(s) of the work for the benefit of the agency which will include the final construction check.

4. LAWS AND REGULATIONS

The use of "TDLR rules" throughout this specification refers to the Water Well Drillers and Pump Installers Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code, Chapter 76, Section 76.104, Technical Requirements - Standards for Capping and Plugging of Wells and Plugging Wells that Penetrate Injurious Water Zone, [State of Texas Water Well Drillers and Pump Installers Administrative Rules](#).

Water well drillers and pump installers must be licensed by the TDLR to plug wells in the State of Texas. Wells must be decommissioned by a well driller with a valid license from TDLR. An exception may be made for hand dug wells less than 20-feet in depth. Well drillers and landowners must comply with the applicable laws and regulations of all Federal, State, Tribal and local agencies including local groundwater conservation districts. It is the responsibility of the landowner to obtain all necessary permits from such entities. A map of the state's groundwater conservation districts can be found at: [State of Texas Groundwater Conservation Districts Map](#)

<p>Conservation practice general specifications are reviewed periodically and updated if needed. To obtain the current version of this specification, contact your Natural Resources Conservation Service State Office or visit the electronic Field Office Technical Guide.</p>
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**NRCS, TEXAS
November 2015**

5. WELL PREPARATION

All well pumping equipment and piping, removable casing and screens, obstructing materials, trash, debris, and existing surface materials must be removed from the well and immediate area, and disposed of in an appropriate manner before disinfection or sealing procedures begin.

To the extent practicable, remove all casings, liners, and screens. Remove casing by either pulling or overdrilling (over-reaming). If some or all of the casing resists removal by pulling or overdrilling, it must be ripped, perforated, or cut off below the ground surface at a depth not less than 2-feet below the land surface or at the maximum depth of frost penetration, whichever is greater.

Where the well casing cannot be removed and an open annular space exists between the outside of the casing and the well bore, the annular space must be sealed using the sealing materials and procedures described in Sections 7 and 8. All casing left in place must be perforated or ripped sufficiently to ensure sealing materials completely fill the casing and annular space.

6. DISINFECTION

If a well contains standing water, it must be disinfected by adding chlorine bleach at a rate of 1-gallon of bleach for every 500-gallons of standing water (100-ppm chlorine concentration) to kill existing microorganisms within the well water before sealing (see Table 1). When practical, the chemical solution must be agitated within the well column. The chemical solution must be left undisturbed for no less than 12-hours to assure complete disinfection. The disinfection process must also comply with TDLR rules and local groundwater conservation district requirements.

Table 1: Well Volumes and Approximate Disinfection Quantities

Well or Bore Hole Diameter Inches	Volume of Water / Linear Ft. Cubic Feet / Ft.	Volume of Water / Linear Ft. Gallons / Ft.	Liquid Chlorine Bleach Needed / Linear Ft. ¹ Fluid Ounces / Ft.
2	0.022	0.163	0.042
3	0.049	0.367	0.094
4	0.087	0.653	0.167
5	0.136	1.020	0.261
6	0.196	1.469	0.376
7	0.267	1.999	0.512
8	0.349	2.611	0.669
9	0.442	3.305	0.846
10	0.545	4.080	1.045
12	0.785	5.876	1.504
14	1.069	7.997	2.047
16	1.396	10.445	2.674
18	1.767	13.220	3.384
20	2.182	16.321	4.178
24	3.142	23.502	6.017
36	7.069	52.880	13.537
40	8.727	65.284	16.713
44	10.559	78.994	20.222
48	12.566	94.009	24.066
60	19.635	146.889	37.604
72	28.274	211.520	54.149
96	50.265	376.036	96.265

NOTES:

1. 1-gallon of 5% liquid chlorine bleach for every 500-gallons of standing water will produce an equivalent concentration of 100 ppm of chlorine.

Disinfection Example: If the measured depth of the well is 100-ft., measured static water level is 45-ft., and the well or hole diameter is 12-in., then;

$$(100 - 45) \text{ ft.} \times (1.504) \text{ oz. of chlorine product per ft., from Table 1} = 82.72 \text{ fluid oz. of chlorine needed} / 128 \text{ fluid oz. per gallon} = 0.65\text{-gals. of liquid chlorine bleach needed to disinfect the well.}$$

7. SEALING MATERIALS

Properties of sealing materials must conform to characteristics listed in ASTM D-5299, part 6.3 Plugging Materials. Sealing materials do not require disinfection.

- (a) Cement - A neat slurry of Portland cement, having a density of not less than 15.36-lbs./gal. (This density may be achieved by mixing 5.5-gals. of water with one 94-lb. sack of Portland cement.), or a cement slurry which contains cement along with bentonite, gypsum or other additives achieving the same density requirement.
- (b) Bentonite Slurry - A fluid mixture of sodium bentonite and potable water mixed at the manufacturers' specifications to a slurry consistency that can be pumped through a pipe and achieving a weight of not less than 10-lbs./gal. of mix.
- (c) Granular Sodium Bentonite - 3/8-inch or larger, coarse ground, untreated, sodium based bentonite (montmorillonite).

8. SEALING PROCEDURES

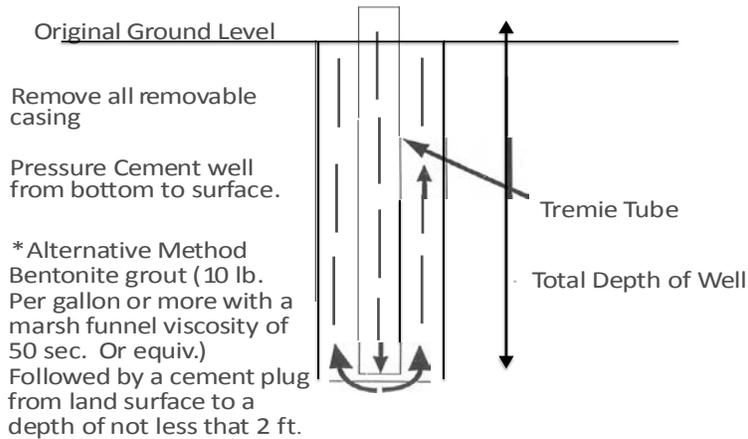
Do not place sealing and fill materials until after completion of the disinfection process. The well must be filled and sealed by one of the following methods:

- (a) The entire well must be pressure filled via a tremie pipe with cement from the bottom up to the land surface.
- (b) The entire well must be pressure filled via tremie pipe with clean bentonite slurry from the bottom up. The top 2-feet of the well must be filled with cement as an atmospheric barrier. *Bentonite slurry may not be used if a water zone contains chlorides above 1500-ppm or if hydrocarbons are present.*
- (c) If the well has 100-feet or less of standing water, the entire well may be filled with a solid column of granular sodium bentonite hydrated at frequent intervals while strictly adhering to the manufacturers' recommended rate and method of application. Care should be taken to ensure bridging does not occur by pouring the material slowly and/or agitation. The top 2-feet of the well must be filled with cement as an atmospheric barrier. *Granular sodium bentonite may not be used if a water zone contains chlorides above 1500-ppm or if hydrocarbons are present.*
- (d) Method (a), (b), or (c) above with the following exceptions. The well must be filled from the bottom of the well to within 6-feet of the land surface. The interval between 4-feet and 6-feet below the land surface must be filled with cement. The interval between the land surface and 4-feet. depth must be filled with soil materials that achieve an in-place hydraulic conductivity equivalent to or less than the surface soil surrounding the well. The land surface must be mounded to compensate for settling and must be graded in a manner that prevents ponding of surface runoff.
- (e) Large hand dug and bored wells 36-inches or greater in diameter to 100-feet in depth may be filled to the surface with compacted clay or caliche. The backfill material must be placed in a manner that minimizes segregation and bulking, mounded above the surface to compensate for settling, and must be graded in a manner that prevents ponding of surface runoff.
- (f) Undesirable water or constituents must be isolated from the fresh water zone(s) with cement plugs and the remainder of the well bore filled with cement or clean bentonite grout. The top 2-feet of the well must be filled with cement as an atmospheric barrier.

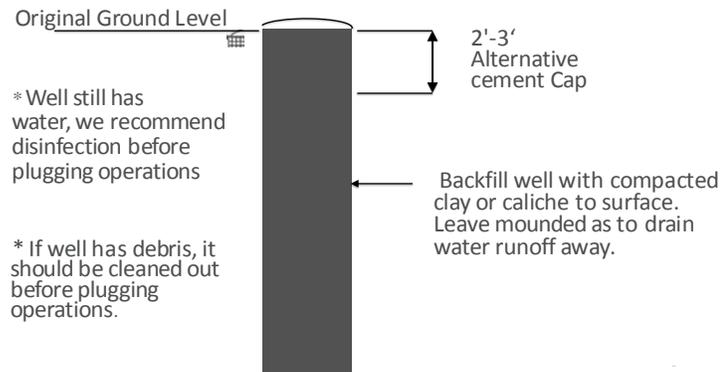
9. **TDLR DRAWINGS** (Downloaded from [TDLR Well Construction and Plugging Specifications](#))

Plugging of Drilled Wells

Chapter 76.104



Plugging of Large Diameter Hand Dug Wells | Exception |



10. CERTIFICATION

The contractor must furnish the owner/operator a written certification (with a copy provided to USDA-NRCS) that the decommissioned well conforms to the requirements of this specification and the TDLR rules. The contractor must certify that they are licensed by the State of Texas to decommission/plug wells. An exception may be made for hand dug wells less than 20-feet in depth.

The certification must also provide the following:

- (a) Copy of the [TDLR Plugging Report](#)
- (b) NRCS Contractor’s Certification Sheet - Well Decommissioning

11. MEASUREMENT

Measurement will be based upon the depth of well that is sealed and permanently closed as reported in feet on the TDLR Plugging Report. An onsite check of the completed work will be performed by a USDA-NRCS representative.

12. CONSTRUCTION DETAILS

Depth of Well to Seal: _____

Diameter of Borehole or Casing to Seal: _____

Static Water Level: _____

Disinfection Required? Yes No

Planned Sealing Material: _____

ATTACHMENTS:

1. [TX- ENG-80B, Cooperator Confirmation of the One-Call Utility Safety System Form](#)
2. [TDLR Plugging Report](#)
3. NRCS Contractor’s Certification Sheet

This general specification, attached construction details and the requirement for completion of a TX-ENG-80B have been reviewed with me and I agree to decommission my water well according to these general specifications.

Owner \ Operator _____
Date