

EXTERNAL GUIDANCE (EG) for the Water Supply Division (WSD)-Plan and Technical Review (PTR) Section

Title: Pressure Cementing of Public Water Supply Wells Submittal Guidance

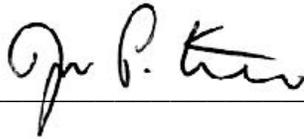
Responsible Team/Section/Program: Plan Review Team/PRT Section

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Joel Klumpp: _____
Section Manager



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Acronyms and Definitions

Term	Definition
AWWA	American Water Works Association
ASTM	American Society for Testing and Materials
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality

Regulatory Reference

Title 30 Texas Administrative Code (30 TAC) §290.41(c)(3)(C)

TCEQ Contact Information

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

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Background

30 TAC §290.41(c)(3)(C) in our current Rules and Regulations for Public Water Systems requires that, for public water supply wells, the space between the casing and the drill hole shall be sealed by cement under pressure, and that the well casing shall be pressure cemented from the top of the shallowest formation to be developed to the earth's surface. The following comments provide specific clarification and guidance for the cementing of public water supply wells.

Guidance

In sealing the annular space, the driller must use cement in accordance with American Water Works Association (AWWA) Standard for Water Wells (A100-06 or latest standard) Section 4.3.5.1 which states that neat cement shall consist of a mixture of American Petroleum Institute Spec.10, Class A (similar to ASTM C150, type 1) or Class B (similar to ASTM C 150, type 2) and water in the ratio of not more than 6.0 gallons of water per 94 pound sack of cement weighing approximately 118 lb/ft³. A maximum of 6 percent, by weight, bentonite and 2 percent, by weight, calcium chloride may be added.

The annular space to be cemented is the space between the outside diameter of the inner well casing and the inside diameter of the outer well casing or borehole. (EPA-570/9-75-001)

Some engineers and water well drillers have assumed that the Tremie Method (as specified in AWWA Standards for Water Wells, A100-06, Appendix C, Section C.1) is an acceptable method of pressure cementation. Engineers and drillers confuse the Tremie Method with the Positive Displacement-Exterior Method (AWWA Standards for Water Wells, A100-06, Appendix C, Section C.2) which can also use a tremie tube. The difference between the two methods is that the Positive Displacement-Exterior Method requires the grout material to be placed by pumping or forced injection by air pressure. In contrast, the Tremie Method involves pouring the grout material into a tremie tube. **Pouring of grout material is not regarded as pressure cementation.**

Engineers and water well drillers have also misinterpreted the meaning of the language "shallowest formation to be developed". This language means the shallowest saturated deposit from which drinking water will be produced in the public water supply well. This regulatory language does not refer to the shallowest stratigraphic formation to be developed or to the shallowest ground water encountered by the well. Determination of the depth of required cementation must consider water-level fluctuations in unconfined or partially confined aquifers, and protection of the well from undesirable water or potential sources of contamination.

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The following guidance provides acceptable methods and depth requirements for the pressure cementation of public water supply wells:

1. The driller will utilize the following pressure cementation methods in accordance with the AWWA Standard for Water Wells (A100-06 or latest standard), Appendix C: Section C.2 (positive displacement-exterior method); Section C.3 (interior method-without a plug); Section C.4 (positive placement-interior method-drillable plug); or Section C.5 (placement through float shoe attached to the bottom of the casing).
2. Tremie Method (A100-06 Section C.1) is not a pressure cementation method and does not meet the requirements of 30 TAC §290.41(c)(3)(C). Use of a tremie tube with a pump is allowed with the Positive Displacement-Exterior Method (A100-06, Section C.2).
3. Exceptions to the requirement that a well be pressure cemented down to the producing aquifer (shallowest formation to be developed) will not be granted without a detailed evaluation by commission staff.

Available Resources

The engineer can get information from:

1. Forms and Checklists for Submitting Plans or Specifications for Public Water Systems
<https://www.tceq.texas.gov/drinkingwater/udpubs.html>
2. TDLR Drilling reports:
<http://www.twdb.texas.gov/groundwater/data/drillersdb.asp>
3. Requesting an Exception to Rules and Regulations for Public Water Systems
<https://www.tceq.texas.gov/drinkingwater/trot/exception>
4. If your well is located within an underground water district, the district might have a copy of the well log. Our Groundwater Planning and Assessment Team coordinates the TCEQ programs for groundwater conservation districts.
<https://www.tceq.texas.gov/groundwater/districts.html>