

Alabama Department of Environmental Management (ADEM)

Water Well Closure/Decommissioning at AFO/CAFO Facilities

ADEM's AFO/CAFO Rule 335-6-7 contains buffer distance requirements for water wells relative to the placement/modification of confinement buildings and waste holding structures. Relief from these buffer requirements can be accomplished by having the well permanently closed/decommissioned which minimizes the risk of polluting groundwater. Please be advised that AFO/CAFO well closure/decommissioning is required to comply with ADEM regulations and must be certified by an Alabama licensed well driller as defined by ADEM Admin. Code ch. 335-9-1 and/or a qualified credentialed professional (QCP) as defined by ADEM Admin. Code r. 335-6-7-.02(rr), as applicable. Well closure/decommissioning certification should be submitted to ADEM's Office of Field Services prior to the construction of the proposed confinement building and/or waste holding structure. A well that has been temporarily or permanently capped (in order to potentially be rehabilitated and put back in service at a later date) is considered an existing well under the ADEM CAFO rules for which buffer setbacks and other requirements fully apply. A capped well is not considered closed/decommissioned. Covering, burying, or building a structure over a well that has not been formally closed/decommissioned, is prohibited.

ADEM regulations can be viewed and downloaded at: www.adem.state.al.us/alEnviroRegLaws/default.cnt

335-7-5-.14 (Groundwater Sources & Treatment – Abandoned Wells)

Abandoned wells and bore holes shall be filled and sealed to prevent contamination of ground water formations. Where feasible or when required by the Department, wells shall be completely filled with neat cement. Other wells shall be sealed in accordance with the most recent American Water Works Association Standards, except that the sealing material for the top 20 feet of fill must be neat cement and no material that could impart taste, odor, or toxic components to water may be used in the sealing process.

335-9-1-.06(g) (Well Construction Standards – Abandonment)

Any well to be abandoned shall be permanently sealed in the following manner: The well will be filled with a puddled clay material containing 50 ppm of chlorine to within 20 feet of the top of the well. The top 20 feet shall be filled with cement grout or concrete.

335-9-1-.02(i) (Definitions)

"Capping a completed well" means the installing of a secure temporary cover sufficient to prevent contamination.

335-9-1-.05 (Materials)

All materials used in the construction of a water well shall have the structural strength to accomplish the purpose for which they are installed.

335-9-1-.05(d)

Capping of the well shall be such that no contamination can enter the well.

The ADEM Permits and Services Division coordinates the private wells and drillers certification program. 334-279-3040 permitsmail@adem.state.al.us

NRCS addresses well decommissioning in Conservation Practice Standard Code 351 - Well Decommissioning. The Well Decommissioning Standard and other related documentation can be

General

According to the U.S. E.P.A., the objectives of a closure-decommissioning procedure are to: 1) eliminate physical hazards; 2) prevent groundwater contamination; 3) conserve aquifer yield and hydrostatic head; 4) prevent intermixing of subsurface water. The purpose of sealing a closed-decommissioned well is to prevent any further disturbance to the pre-existing hydrogeologic conditions that exist within the subsurface. The plug should prevent the vertical movement within the borehole and confine the water to the original zone of occurrence (U.S. EPA, 1991).

Selection of the appropriate method of well closure-decommissioning should be made after considering: 1) the casing material, 2) casing condition, 3) diameter of the casing, 4) quality of the original seal, 5) depth of the well, 6) well plumbness, 7) hydrogeologic setting and 8) the level of contamination and the zone or zones where contamination occurs. If no cross-contamination can occur between various zones and contamination cannot enter from the surface, grouting the well from bottom to top without removing the casing may be sufficient. However, since the primary purpose of monitoring well closure-decommissioning is to eliminate the vertical migration of fluids along the borehole, removal of the casing is the preferred method of well closure-decommissioning. When the casing is removed, the borehole can be sealed completely and there is less potential for channeling in the annular space or inadequate casing/grout seals (U.S. EPA, 1991).

Regulatory requirements and accepted procedures for the closure-decommissioning of monitoring wells, public water supply wells and domestic water wells vary depending upon the regulatory program which required the well to be installed and/or regulates its use, the geologic environment in which the well is located, the purpose and use of the well and the type of well installed. The appropriate subsection listed below should be consulted prior to planning a well closure-decommissioning program. *Some regulatory programs require a plan to be submitted prior to attempting well closure-decommissioning. In situations where a plan is not required before well closure-decommissioning is performed, consultation with the appropriate ADEM personnel is highly recommended.*

Closure-Decommissioning of Individual Water Supply Wells

Individual water supply wells are relatively shallow in depth and serve one to several households with enough water for domestic purposes. These wells are typically one of three types: shallow dug wells, driven or sand point wells or drilled or augered wells. As with other types of wells, the type and depth of well should be determined prior to plugging. Any obstructions in the well should be removed prior to initiating the plugging operation and under no circumstances should any part of the casing be allowed to remain above the surface of the ground after plugging.

Accurate records should be kept of the well location, depth, filling material, date of plugging, etc.

Shallow Dug Wells - Hand dug wells that extend down to the aquifer and are sometimes blasted or chipped into bedrock to reach the aquifer. Stone or concrete walls called curbing sometimes is necessary to keep the well from collapsing. These wells are rarely deeper than a few tens of feet and have diameters that are usually several feet across.

Pumps, piping or debris should be removed and the top 3 to 5 feet of curbing should be broken up prior to filling. Any portion of the well that extends into bedrock should be filled with a concrete-

bentonite grout. The remainder of the well should be filled with clean native materials that approximate the permeability of the aquifer and overlying soils in the vicinity of the well. The soil should be compacted to prevent settling and ponding of water in the location of the former well.

Driven or Sand Point Wells - A well that is driven to the desired depth, either by hand or machine and may employ a wellpoint, or alternative equipment. These wells typically have a small diameter (2 inches or less) with a short screen near the pointed end and can only be used in soft sandy sediments or soils.

Driven or sand point wells should be removed if their diameter is 2 inches or less and their depth is 25 feet or less. The hole should be filled with a bentonite-cement grout. If greater than 25 in depth, larger than 2 inches in diameter, or cannot be removed, the well should be filled with a bentonite-cement grout from bottom to top using the pump-down method using a tremie pipe.

Drilled Wells - Diameters of 2 to 20 inches are typical for these wells which are installed with the use of a drilling rig and may be several tens to several thousand feet deep. In Alabama drilled domestic wells are generally less than 250 feet deep.

Drilled domestic wells are often unique in design and depth and should be closed-decommissioned only by a licensed well driller. If possible, the casing should be removed and the borehole filled with a cement-bentonite slurry. If the casing cannot be removed, the entire well should be filled with a cement-bentonite slurry using the pump-down method with a tremie pipe. In areas subject to subsidence and/or farming, the top of the casing shall be cut off a minimum of three (3) feet below the surface of the ground before plugging operations begins. After filling the well with the cement-bentonite slurry, the excavation above the top of the cement plug shall be filled with compacted soil to minimize future hazards to farming equipment etc. In other areas, the top of the casing shall be cut off at or below the ground surface.

References

United States Environmental Protection Agency, 1991. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells; United States Environmental Protection Agency, Office of Research and Development, EPA/600/4-89/034, 221pp.

ADEM Admin. Code Div. 335-13

ADEM Admin. Code ch. 335-6-15

ADEM Admin. Code ch.. 335-9-1

American Water Works Association Standards A100-66-A1-13

EPA, 1991: Region IV Environmental Compliance Branch, Standard Operating Procedures; United States Environmental Protection Agency.