

**Natural Resources Conservation Service  
Conservation Practice Standard**

**WELL DECOMMISSIONING  
(No.)  
CODE 351**

**DEFINITION**

The sealing and permanent closure of a water well no longer in use.

**PURPOSE**

This practice serves to:

- Prevent entry of vermin, debris, or other foreign substances into the well or well bore hole.
- Eliminate the physical hazard of an open hole to people, animals, and farm machinery.
- Prevent entry of contaminated surface water into well and migration of contaminants into unsaturated (vadose) zone or saturated zone.
- Prevent the mixing of chemically or physically different ground waters between separate water bearing zones.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to any drilled, dug, driven, bored, or otherwise constructed vertical water well determined to have no further beneficial use.

This practice does not apply to wells that were used for waste disposal, or if evidence of contamination still exists. This practice does not apply to wells that contain contaminant levels that exceed state or federal water quality standards. Treatment of contamination source(s) is required before a well is decommissioned.

**CRITERIA**

**General**

General criteria for design parameters, acceptable installation processes, or minimum performance requirements applicable to all purposes named above:

All work planned shall be in compliance with "Mississippi Surface Water and Groundwater Use and Protection Regulations." Regulations are available from Department of Environmental Quality-Office of Land and Water Resources (DEQ-OLWR), P. O. Box 10631, Jackson, Mississippi 39289-0631 (telephone no. 601-061-5200).

1. Data collection. All available data for the well shall be collected and reviewed from as-built construction and maintenance records, i.e., well log, the materials schedule, length, and diameter of casing, total well depth, type of liners and screens, and related information. The existing conditions of the well shall be documented as shown in the "Plans and Specifications" section.
2. Well preparation. The well shall be cleared of all pumping equipment, valves, pipelines, casing liners, debris, and other foreign material.
3. Disinfection. Before sealing, the well water shall be decontaminated by bringing the well water to a 100 ppm chlorine concentration. A 100 ppm chlorine solution will require: 1 pint of 5 percent chlorine bleach per 62 gallons of water or 1.3 pounds high-test calcium hypochlorite tablets per 1000 gallons of water.
4. Sealing materials. All materials used for sealing any portion of the well shall have a hydraulic conductivity equivalent to or less than that of the lowest hydraulic conductivity of the geologic materials being sealed. Properties of sealing materials shall conform to characteristics listed in ASTM D5299, part 6.3 Plugging Materials.
5. Fill materials. Sand, pea gravel, sand-gravel mix, crushed stone, or agricultural lime can be used to plug the well provided that zones of sealing materials (conforming to ASTM D5299, part 6.3) are placed no less than one foot thick each at intervals no greater than

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10 feet within the column. Exception: Irrigation wells in the Mississippi River alluvial floodplain may be filled with a clean sand/gravel mixture up to at least 10 feet above the top of screen but not closer than 20 feet to ground surface. The casing area above the sand/gravel shall be grouted with other materials conforming to ASTM D 5299. Other methods of sealing a well may be approved upon written request to DEQ-OLWR.

6. Placement of materials. All materials shall be placed without bridging. For wells greater than 30 inches in diameter, backfill shall be placed in a manner that minimizes segregation and bulking in order to prevent surface subsidence. Sand/gravel mixture and bentonite pellets placed in wells less than 10 inches in diameter at depths greater than 20 feet shall be placed with a tremie pipe to ensure continuous placement of the material without air or water gaps. The cement-bentonite mixture, neat cement, and cement grout shall be placed by pumping methods.
7. Surface seal. Well casings shall be cut off at least 3 feet below the land surface. The area around and on top of the cutoff casing shall be backfilled with compacted, clean native clayey soils and shaped with a slight mound to direct surface water away from the site and prevent ponding. Backfill material shall be free of pesticide and waste contaminants.
8. Dug wells shall have the upper 3 feet of lining removed. The well cavity shall be filled with local, uncontaminated clay. Backfill material shall be placed in 2-foot layers and compacted to form a low permeability fill. The surface area shall be slightly mounded and shaped to direct surface water away from the site and prevent ponding.

### **Additional Criteria to Prevent Mixing of Ground Waters Between Separate Water Bearing Zones**

Wells with open annular space around the casing shall be treated in a manner that seals the voided annular space. Methods of treatment include (1) removing the casing or (2) grouting the casing in place. Casing removal is acceptable when the entire casing can be removed from the well. Casings removed from a collapsing formation shall be grouted concurrent with removal such that the bottom of the casing remains submerged in the grout.

Casings grouted in place shall employ a grouting procedure that will fill the open space. Perforated or ripped casing shall provide sufficient apportioned open area to assure passage of the grout to the annular space. The casing shall be perforated or ripped throughout the entire length of a confining layer. Wells with gravel exposed in the annular space at casing cutoff depth shall have at least an additional 3-foot depth of gravel removed and space backfilled with compacted, clean native (clayey) soils.

### **CONSIDERATIONS**

This practice may be part of a ground water protection system that includes water and chemical management practices.

To the extent practicable, an abandoned well should be decommissioned in a manner that restores the original hydrogeologic conditions of the well site and does not preclude the use of the site from future land management practices.

Decommissioning requires special consideration of specific geological, biological, physical, and climatic conditions, the chemical composition of the surrounding soil, rock, and ground water at the well site, and the well's construction practices. All procedures, fill and sealing materials need to be selected according to these considerations.

### **PLANS AND SPECIFICATIONS**

Plans for decommissioning abandoned water wells shall be consistent with this standard and shall describe the requirements for applying the practice to achieve its intended purposes. Specifications for the plugging and sealing of abandoned water wells shall use or be in conformance with the requirements of the attached "Construction Specification." Any

variation from these specifications shall be approved by DEQ-OLWR or NRCS field office.

A record of the installation of this practice shall be made and shall include the following information:

- Location of the decommissioned well by latitude/longitude, township/range, or other georeference convention, of such precision that it can be readily located in the field, if required, in the future.
- Date of well decommissioning.
- Name of landowner.
- Total depth of well.
- Inside diameter of well bore or casing.
- Casing material type.
- Static water level measured from ground surface.

The person who plugs the abandoned well shall complete and submit NRCS Form MS-ENG-37 or other acceptable form with required information to DEQ-OLWR within 30 days of completion and provide a copy to the Natural Resources Conservation Service field office for records.

#### **OPERATION AND MAINTENANCE**

The practice site shall be inspected periodically to ensure that the decommissioned well and the adjacent area have not settled or eroded, or are otherwise adversely disturbed. The well site and adjacent ground surfaces shall be maintained in a manner that prevents ponding of surface runoff on the site.

## Natural Resources Conservation Service Construction Specifications

### WELL DECOMMISSIONING

#### 1. SCOPE

Work shall consist of recording well data, providing and installing well sealing materials, and shaping well area.

#### 2. SITE PREPARATION

All well equipment, trash and debris shall be removed from the well area and disposed of in an appropriate manner. Remove stagnant, contaminated water and sanitize with chlorine as needed.

#### 3. MATERIALS

Well grouting and backfill materials shall be clean and free from contaminants and pollutants. Materials shall be in accordance with the following:

- a. Sand/gravel mixture shall consist of a sand and gravel "filter pack" compatible with the well screen. The maximum particle size of the gravel shall not exceed 1/10 of the diameter of the well or 2 inches in diameter, whichever is smaller.
- b. Cement grout shall consist of a mixture of cement, sand, (1:1 ratio) and not more than 7 gallons of clean water per sack (94 pounds) of cement.
- c. Neat cement shall consist of a mixture of cement and water with not more than seven (7) gallons of water per sack (94 pounds) of cement.
- d. Cement-bentonite mixture shall consist of cement and bentonite (5-8 percent bentonite by dry weight) with not more than 10 gallons of clean water per sack (94 pounds) of cement.
- e. Bentonite may be used in powder, granular, chip, or pelletized form. Powder bentonite will be used in slurry and grouting mixtures. Granular, chip, and pellet bentonite will be used to fill the inside of the well casing.
- f. Native clayey soil used for backfill shall be free from pesticides and other contaminants.

#### 4. PLUGGING AND SEALING

Measured or estimated well diameter and depth shall be used for calculating quantity of materials needed to fill the well.

Each well pipe and boring hole shall be completely filled starting at the bottom and proceeding to the top. Grout material will be placed with a grout pump. Granular material placed in wells less than 10 inches in diameter at depths greater than 20 feet shall be placed with a tremie pipe. Granular material may be allowed to free-fall for depths less than 20 feet provided that the material is tamped into place. Fill material for a dug well shall be placed in 2-foot layers and compacted.

The well casing or dug well liner shall be cut off at least 3 feet below ground surface and removed from the site. The area over the sealed well shall be backfilled with compacted, clean native clayey soil and shaped with a slight mound to direct surface water away from the site and prevent ponding. On all areas not farmed, the disturbed area shall be vegetated.

#### 5. MEASUREMENT AND PAYMENT

No measurement of quantities shall be made. Quantity of material (filter pack, cement, bentonite, clay soils, etc.) used to decommission the well shall be determined by depth and diameter of the well and shall be listed on form MS-ENG-37. A lump sum payment shall be made for decommissioning abandoned water wells and shall be considered full compensation for all materials, labor, and equipment necessary to complete the job.

#### 6. CONSTRUCTION DETAILS

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WELL DECOMMISSIONING

COUNTY \_\_\_\_\_, FIELD OFFICE \_\_\_\_\_

Cooperator \_\_\_\_\_

Cooperator Address \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

WELL DATA:

Well no. \_\_\_\_\_, Coded no. \_\_\_\_\_, MS-DEQ water use permit no. \_\_\_\_\_

Well location: Section \_\_\_\_\_, Township \_\_\_\_\_, Range \_\_\_\_\_

Nearest town \_\_\_\_\_, Distance \_\_\_\_\_, Direction \_\_\_\_\_

Well purpose

(Home, irrigation, municipal, industrial, fish pond, etc.) \_\_\_\_\_

Well depth \_\_\_\_\_, Casing diam. \_\_\_\_\_, Casing length \_\_\_\_\_, Type of casing \_\_\_\_\_

Depth to static water level \_\_\_\_\_, Date of measurement \_\_\_\_\_

Name of well contractor who drilled well \_\_\_\_\_

Date well completed \_\_\_\_\_, Landowner when well drilled \_\_\_\_\_

DECOMMISSIONING DATA:

Name of decommissioning drilling firm/person \_\_\_\_\_

Date well decommissioning completed \_\_\_\_\_

Describe how well or hole is decommissioned or plugged (amount of casing/screen removed, materials and quantities used in plugging):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CERTIFICATION: I certify that this well was decommissioned in accordance with NRCS standard and specifications.

Signature \_\_\_\_\_ Position \_\_\_\_\_ Date \_\_\_\_\_

Note: This form was prepared in cooperation with DEQ-Office of Land & Water Resources. This form must be sent within 30 days of completion of decommissioning to: DEQ-Office of Land & Water Resources, P. O. Box 10631, Jackson, MS 39289-0631.