

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**WELLHEAD PROTECTION  
(AGRICULTURAL DRAINAGE WELL CISTERNS)  
(No.)  
INTERIM CODE IA-981**

**DEFINITION**

Protection of an agricultural drainage well to prevent surface water from entering the well.

**PURPOSE**

To improve water quality by preventing surface water from entering into an agricultural drainage well.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to any agricultural drainage well in which surface water could enter into the well and cause pollution or contamination of the groundwater. This standard applies to the well casing or cistern to a depth which generally will not exceed six feet below the ground surface.

**CRITERIA**

Agricultural drainage wells shall be protected from the entry of surface water by raising the cistern or well head as needed.

For wells in depressional areas, the cistern shall be raised to the higher of the following:

- The elevation needed to store the volume of runoff from the 50-year, 24-hour rainfall event. A runoff value of 3.0 inches may be used in lieu of site-specific calculations.
- A minimum of two feet above the ground surface.

The cistern does not need to extend more than one foot above the low point in a saddle if the topography would allow water to drain into a different drainage pattern.

If an agricultural drainage well is in a drainage path (i.e.: not in a depression), the cistern shall be raised to the higher of the following:

- A minimum of two feet above the ground surface, or
- The elevation of the flow from a 50-year, 24-hour rainfall event.

The material used to raise the cistern may be metal pipe, concrete pipe, or reinforced concrete. It is generally recommended that material used be the same as the original cistern; however, different material may be used as long as other requirements are met. In all cases, the joint between the old cistern and the extension shall be watertight.

**Repairing Damaged Well Cisterns.** Well cisterns which have corroded, broken, deteriorated, or are damaged in the first six feet below the ground surface shall be repaired or replaced according to criteria in this standard. Some options for accomplishing this requirement are as follows:

- Remove the old cistern to a depth below the damaged area. Replace this section with new material. The joint between the new and old material shall be watertight.
- Damaged cisterns may be repaired by lining the old cistern if the structural integrity of the cistern will permit. Liners shall form a watertight bond with the original cistern.
- In some situations it may be possible to line an existing cistern by placing a new cistern inside the original cistern. For example, a damaged 36-inch diameter cistern could be repaired by placing a 24-inch diameter pipe inside the 36-inch cistern. If this option is used, the space between the old and new cisterns shall be filled with concrete.

**Berms and Backfill.** All wells shall be protected with a berm around the cistern. Material in the berm and backfill around the cistern shall be of material which includes a high clay content. The material shall be placed in six-inch lifts prior to compaction. The density of the backfill shall be greater than the natural ground around the well. The top of the berm shall extend ten feet from the edge of the cistern on all sides of the well. The top of the berm will be one foot below the top of the cistern and will have a 5 percent slope away from the cistern (0.5 foot in ten feet). The side slope of the fill for the berm shall not be steeper than 3 horizontal to 1 vertical.

The berm shall be seeded to permanent vegetation in accordance with Critical Area Planting (342).

**Diversions.** Diversions shall be used to direct surface flow around the well if the topography allows.

**Safety.** All well cisterns shall have a cover which can be locked. The cover is to prevent access by unauthorized personnel, rodents, etc. The covers of all cisterns shall be vented to allow gases to escape as well as to prevent a vacuum from occurring.

## CONSIDERATIONS

Consider closing agricultural drainage wells by providing alternative outlets or changing the land use.

An additional grassed setback beyond the berm is recommended.

The protection of agricultural drainage wells from surface water contamination should include the application of conservation practices which protect the water resource throughout the entire watershed. Wellhead protection is used at the well as the final measure to keep surface water from entering the well.

The type of wellhead protection used depends on the physical layout of the system.

If the well is in the lowest point in a drainage path surface diversions should be considered.

## PLANS AND SPECIFICATIONS

Plans and specifications for wellhead protection shall be in keeping with this standard and shall

describe the requirements for applying the practice to achieve its intended purpose.

The following list of Construction Specifications is intended as a guide to selecting the appropriate specifications for each specific project. The list includes most, but may not contain all, of the specifications needed for a specific project:

- IA-1 Site Preparation
- IA-3 Structure Removal
- IA-5 Pollution Control
- IA-6 Seeding and Mulching for Protective Cover
- IA-9 Drainage Tile Investigation and Removal
- IA-11 Removal of Water
- IA-21 Excavation
- IA-23 Earthfill
- IA-27 Diversions
- IA-45 Plastic (PVC, PE) Pipe
- IA-51 Corrugated Metal Pipe
- IA-52 Steel Pipe Conduits
- IA-81 Metal Fabrication and Installation
- IA-95 Geotextile

## OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan will be prepared for each site. Specified actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance). The following activities shall be addressed in the plan:

- The cover of the cistern shall be locked except when it is opened for inspection, maintenance, etc.
- At least annually, inspect the structural integrity of the lining/cistern.
- Inspect the vent to insure that it is open and able to function properly.
- Inspect the berm for erosion, piping, etc. Repair and reseed any damaged areas.

## REFERENCES

USDA-NRCS, National Engineering Handbook (NEH), Part 650, Engineering Field Handbook (EFH), Chapter 14, Drainage

[Iowa Drainage Guide](#), Iowa State University, Special Report 13