Natural Resources Conservation Service
Interim Conservation Practice Standard

POLLUTION RETENTION RESERVOIR
(No.)
CODE 720

DEFINITION

A water impoundment reservoir with controlled water release to trap and store nonpoint source pollutants from agricultural lands.

PURPOSE

To maintain or improve downstream water quality by providing an environmentally safe reservoir for deposition and storage of agricultural nonpoint source pollutants.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where normal runoff from agricultural lands poses a potential impairment to downstream water quality.

CRITERIA

Design criteria to assure the structural soundness of the reservoir embankment shall follow that given in Conservation Practice Standard 378 Ponds. This standard does not apply to Sediment Basins (350) or to Water and Sediment Control Basin (638). In addition, the following criteria shall apply:

Structure location. The reservoir should be located at the most downstream location to maximize pollution collection and impoundment area. Adequate normal pool and temporary flood storage shall be available for proper functioning of the pollution retention reservoir. The structure shall have a principal spillway pipe release. An outlet channel that is stable and of adequate capacity for pipe spillway flow shall exist or be provided.

Structure storage volume. (1) Normal Pool - The minimum normal pool shall hold a storage volume equivalent to the 2-year 24-hour storm runoff for the contributing drainage area. This volume will allow a natural biological breakdown of pollutants and a settling of suspended solids. (2) Flood Pool - The minimum flood pool volume storage should be equivalent to the 5-year 24-hour storm runoff from the contributing drainage area. The temporary detention of floodwaters will allow for settling of heavier suspended solid particles and attached pollutants.

Structure water release. The principal spillway pipe system shall be designed for surface water removal from the impoundment. The principal spillway riser may be single stage or two-stage. For single stage risers, drawdown of the temporarily stored floodwater shall not be released in less than 18 hours but need not exceed 48 hours. For flood water releases exceeding 48 hours, inundation effect on the flood pool area must be considered.

Two-stage risers offer the opportunity to provide additional pollution treatment through increased detention time for waters stored between the low and high-stage crests. Orifice openings or narrow weirs may be used as low-stage releases. Total release time of flood pool storage through the high- and low-stage openings shall not exceed 10 days. This is to assure that storage is available for the next storm runoff. Flood pools for long-term release periods should be dedicated to storage of floodwaters.

Outlet channel. Outlet channels shall be large enough to contain principal spillway release flows enroute to a main channel. Placing the structure near the main stream in the lower part of the watershed will minimize flows across crop and/or pasture land to reach a main channel outlet. A stable outlet channel shall be provided for the principal spillway pipe flow.

CONSIDERATIONS

Water quantity

The effects on water quantity must be considered including the following:

- Rates and volume of runoff
- Infiltration
- Evaporation
- Transpiration
- Deep percolation
- Groundwater recharge

Water quality

The following considerations shall apply:

- The type and source of agricultural pollutants and their effects on downstream water quality must be verified.
- The sediment yield at the site must not be excessive. Appropriate conservation measures must be applied to the contributing watershed to reduce erosion to acceptable levels.

Other considerations

- Construction must be practical and economical.
- Site conditions including topographic, geologic, and soils must be satisfactory.
- Soil sealing must be considered if subsurface migration is a potential.

PLANS AND SPECIFICATIONS

Plans and specifications for installing pollution retention reservoirs shall be in keeping with this standard. Additionally, construction specifications shall conform to construction specifications provided for Pond (378) covering principal spillways, emergency spillways, embankments, site preparation and any other design features.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be prepared for each site to include regular inspections (annually or after large storm events) and shall focus on condition of embankment, spillway pipe, vegetated spillway and continued availability of pool storage volumes. Appropriate corrective action shall be taken for any problem identified.