NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Irrigation Pit or Regulating Reservoir

Regulating Reservoir

(Number)

Code 552B

DEFINITION

A small storage reservoir constructed to regulate or store a supply of water for irrigation.

PURPOSES

To store water for relatively short periods to:

- Provide for regulating fluctuating flows in streams or canals,
- Provide suitable (usually larger) irrigation streams,
- Provide for improved management of irrigation water,
- Permit more efficient use of available labor,
- Avoid nighttime operation, and
- Provide storage for reuse irrigation systems.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies only to sites meeting all the following criteria and conditions:

1. The existing available irrigation stream is of such size that regulation is necessary to accomplish the intended purposes. For small irrigation wells, collection facilities are needed for efficient operation of the pumping plants.
2. Water must be stored to be used between times of rotation deliveries.
3. An adequate and dependable volume of good quality water is or can be made available.
4. Topographic, geologic, and soils conditions are suitable for the practical construction of a regulating reservoir having an adequate storage capacity. Previous soils in the reservoir area can be sealed so that seepage losses are not excessive.
5. If surface runoff enters the reservoir, the contributing drainage area is or can be protected against erosion so that normal sedimentation does not materially shorten the planned life of the reservoir.

CRITERIA

Capacity. Irrigation regulating reservoirs shall have a usable capacity sufficient to permit the existing irrigation stream to be regulated so that irrigation water can be applied with a reasonably high efficiency. In computing capacity requirements, due consideration shall be given, where applicable, to diverted inflow surface runoff, precipitation, evaporation and seepage.

Excessive seepage losses shall be prevented by the use of an adapted method of sealing or lining. Additional capacity shall be provided, as necessary, for sediment storage.

Capacity requirements for regulating reservoirs used as a part of a system for collecting water from two or more small wells shall be based on the discharge capacities of the contributing wells and on the operation frequency of the sprinkler system.

Reservoir design. Irrigation regulating reservoirs created by earthen dams, enclosed embankments, excavated pits, and the related appurtenant structures shall be designed according to the standard for Ponds (378).

Concrete and steel regulating reservoirs shall be designed to the standard for Trough or Tank (614).

Inlet protection. If the inflow enters the reservoir, the side slope of the reservoir shall be protected against erosion by the use of a pipe inlet or some other suitable structure. The capacity of the inlet structure shall be no less than that required to accommodate the maximum anticipated rate of inflow.

Overflow protection. An overflow protection structure having a capacity equal to or greater than the inlet stream shall be provided for an enclosed embankment. This structure may be designed and installed in combination with the outlet works.

Outlet works. Outlet works shall be provided for the controlled release of irrigation water. The outlet works may consist of a gated conduit through or over the embankment for gravity flow to the irrigated area or to a pumping plant. They may also consist of a pumping plant designed to lift water directly from the reservoir basin.

The capacity of the outlet works shall be no less than that required to provide the outflow rate needed to meet peak period irrigation system demands.

CONSIDERATIONS

An irrigation regulatory reservoir should be part of the treatment needed to protect soil, water, plant, animal, and air resources. In addition, a conservation cropping system, conservation tillage, crop residue management or other appropriate system should be planned to control erosion above the reservoir and protect the other resources. The management system must be planned to prevent excessive maintenance and operation problems.

Effects on water quantity and quality shall be considered. This practice is generally built at ground surface above the water table. It includes reservoirs constructed of concrete or steel. Downstream flows may be reduced by water storage. Stored water may recharge ground water through deep percolation depending on site geologic conditions. The water surface will allow evaporation.

Where ground water recharge would occur with low quality water, ground water contamination may result. Where recharge water quality is better than that in the aquifer there may be improvement. Surface water would be improved by trapping sediments and sediment-attached substances in the reservoir before downstream release. Increased water temperatures may occur downstream with discharge from the reservoir. The reservoir may provide limited benefits from increased aquatic habitat or be a source of wildlife water.

Special attention shall be given to maintaining and improving visual resources and habitat for wildlife where applicable. The landowner/user will be advised if wetlands will be affected and USDA/NRCS wetland policy will apply. All work planned shall be in compliance with General Manual Title 450-GM, Part 405, Subpart A, Compliance with Federal, State and Local Laws and Regulations. If archaeological or historical properties are encountered, the USDA/NRCS policy in General Manual Title 420-GM, Part 401 shall be followed.

PLANS AND SPECIFICATIONS

Plans and specifications for irrigation regulating reservoirs shall be in keeping with this standard and shall describe the requirements for properly

installing the practice to achieve its intended purpose.

Regulating Reservoir Specifications. Earthen irrigation regulating reservoirs shall be constructed according to the construction and materials specification for Ponds (378).

Concrete and steel regulating reservoirs shall be constructed according to approved standard drawings and the associated construction and material specifications established for Trough or Tank (614)

OPERATION AND MAINTENANCE

A maintenance program shall be established by the landowner/user to maintain capacity and vegetative cover. Items to consider are:

1. Do not graze protected area of embankment and reservoir.

2. Fertilize to maintain a vigorous vegetative cover in protected area. Caution should be used with fertilization to maintain water quality.

3. Mulch, spray or chop out undesirable vegetation periodically to prevent growth of large woody-stemmed weeds, water plants such as cattails or trees (such as willows) from embankment and spillway areas. Caution should be used to use only chemicals approved for this use on the label.

4. Promptly repair eroded areas.

5. Promptly remove any burrowing rodents that may invade area of embankment and reservoir areas.

6. Re-establish vegetative cover immediately where scour erosion has removed established seeding.

7. Keep all spillways open and remove trash that may accumulate around entrance.

8. Periodically inspect area for any new maintenance items and if any are observed take immediate action to protect from further damage or deterioration.