

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

SEDIMENT BASIN

(No.)
CODE 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSE

Preserve the capacity of reservoirs, wetlands, ditches, canals, diversion, waterways, and streams.

Prevent undesirable deposition on bottom lands and developed areas.

Trap sediment originating from construction sites or other disturbed areas.

Reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural waste solids, and other detritus.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion-control measures to keep soil and other material in place or where a sediment basin offers the most practical solution to the problem.

CRITERIA

Laws and Regulations. This practice must conform to all federal, state, and local laws and regulations. Laws and regulations of particular concern include those involving water rights, land use, land disturbed by construction, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.

Other General Criteria. Where sediment basins will not be emptied on a regular schedule, sediment capacity shall equal the volume of sediment expected to be trapped at the site during the planned useful life of the basin or the life of improvements it is designed to protect. Where sediment basins will be emptied on a regular schedule, sediment capacity must at least equal the expected sediment inflow between emptying events.

The design of dams, spillways, and drainage facilities shall be according to South Dakota Natural Resources Conservation Service (NRCS) Conservation Practice Standards Pond (378), Grade Stabilization Structure (410), or Earth Dams and Reservoirs (NRCS TR-60), as appropriate for the class and kind of structure being considered.

Temporary basins having drainage areas of 5 acres or less and a total embankment height of 5 feet or less may be designed according to South Dakota NRCS Conservation Practice Standard Water and Sediment Control Basin (638).

All disturbed areas shall be treated as soon as possible after construction ends to control erosion and prevent excess sediment from leaving the site.

Provisions shall be made for dewatering sediment pools if necessary for sediment removal, safety, and/or vector control.

Fencing and other safety measures shall be installed as necessary to protect the public.

Due consideration shall be given to good visual resource management.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

ADDITIONAL CRITERIA FOR SEDIMENT BASINS INCLUDED IN WASTE MANAGEMENT SYSTEMS

Structures designed under this standard may be used to separate agricultural waste sediment from liquids as a component of an agricultural waste management system.

Sediment basin embankments, foundations, and fabricated structures (concrete, metal, wood) must meet requirements outlined in Waste Storage Facility (313).

Waste management systems for animal feeding operations that commenced construction (or had significant expansion) after February 12, 2003, that require permitting through South Dakota Department of Environment and Natural Resources, and that involve waste from swine, poultry, or veal, must contain the 100-year frequency, 24-hour duration runoff without discharge. Waste management systems that do not meet the above criteria must contain the 25-year frequency, 24-hour duration runoff without discharge. Sediment basins must also be able to safely pass these runoff volumes, by documenting the flood routing of the design storm through the sediment basin.

Liquids and solids removed or discharged from the sediment basin must be delivered to a Waste Storage Facility (313), Waste Treatment Lagoon (359), or other appropriate component of the waste management system.

The soil cover complex number (runoff curve number) used in computing runoff from feedlot surfaces shall not be lower than **97** for paved lots and **90** for unpaved lots.

Embankments. The minimum elevation of the top of the settled embankment shall be one foot above the water surface in the basin when passing the design storm with the sediment basin's required sediment capacity filled and not available for temporary detention storage. Required fill height shall be increased by the amount needed to ensure that the top elevation will be maintained after settlement.

Sediment Capacity. Sediment basins must be designed for sediment removal using available equipment. Drainage structures (screen, perforated riser, slatted wall, v-notch weir etc.,) or filtered pumping systems must be provided to remove liquids from sediment basins within 72 hours or less of runoff events.

Sediment basins that are a component of a waste management system must provide the minimum sediment capacity as determined by the following:

$$\text{Volume of Solids} = \frac{(0.5\text{ft}^3)(\text{No. 1000lb Animals})(\text{Confinement Days})}{\text{No. of Feedlot Cleanings per year}} \times (\text{S.F.})$$

S.F. = Slope Factor: 3% or less = 0.25

3% to 6% = 0.50

6% to 10% = 0.75

over 10% = 1.00

Sediment storage capacity for sediment basins used for other purposes will follow the storage criteria as described below for temporary sediment basins.

ADDITIONAL CRITERIA FOR TEMPORARY SEDIMENT BASINS

Temporary sediment basins are used at construction and other sites where the basin will be used for periods of 2 years or less, the drainage area is 10 acres or less, and where failure of the embankment (if any) would not cause loss of life or damage to high value property.

Temporary sediment basins must provide at least 3,600 cubic feet of sediment storage for each acre of sediment contributing drainage area. These sediment basins must be cleaned when effective sediment storage drops below 0.2 drainage area inches.

Minimum effective top widths are given in Table 1. Maximum design height of the embankment must be 15 feet or less measured from natural ground at centerline of the embankment.

Table 1. Minimum Embankment Top Width

Fill Height (feet)	Effective Top Width (feet)
0-5	3
5-10	6
10-15	8

Portions of embankments designed to impound more than 3 foot depth of water must include foundation treatment and seepage control as required by the Pond (378) standard.

Where water will be impounded adjacent to the embankment to a depth exceeding 3 feet, the embankment must not be overtopped by runoff from a 10-year frequency, 24-hour duration storm.

At the end of the period of need for the structure, the structure should be removed and the area graded and seeded as appropriate.

CONSIDERATIONS

Visual aesthetics may be a concern. Blend the basin with surrounding topography, or use plantings to screen the view.

Using native species for revegetation will increase habitat diversity.

Considerations for Waste Management.

Where possible, sediment basin surface area should be at least five percent of the size of the sediment contributing area for effective removal of light weight sediment from liquids. Sediment basin bottoms should be relatively flat with positive slope toward the sediment basin outlet where possible, to facilitate sediment removal.

All known outlet structure designs for agricultural waste settling basins can become plugged or frozen and should be designed for easy cleaning. For effective sediment removal, outflows should be restricted by slotted or perforated walls or risers or by V-notch weirs.

Consider sediment basins that have concrete bottoms with curbs or walls (for machine buckets to push against while loading) which will allow sediment removal in less than ideal weather.

If earth basins are used, consider including two basins so one can dry out for cleaning while the other is being used to settle solids.

Sediment basins for agricultural waste require continuing management and maintenance. They should have solids removed frequently to function properly.

PLANS AND SPECIFICATIONS

Plans and specifications for installing this practice shall meet this standard and describe the requirements needed to achieve the purpose.

Specify rates of seed, mulch, and fertilizer, appropriate planting dates, and method(s) of establishment.

OPERATION AND MAINTENANCE (O&M)

An O&M plan shall be prepared for use by the owner/operator. The plan shall provide specific instructions for operating and maintaining the system to insure that it functions properly.

For waste management systems, the plan must include the design schedule of required sediment basin sediment removal operations, and lot cleanings.

After major storms, inspect the sediment basin for damage that may affect its function and performance. Repair damage.

Mow as needed to maintain adequate vegetative cover and to prevent establishment of undesirable species.