

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
CONNECTICUT / RHODE ISLAND**

WASTEWATER TREATMENT STRIP

(Acre)

CODE 635

DEFINITION

A treatment component of an agricultural waste management system consisting of an area of vegetation with needed appurtenances for reducing total suspended solids from agricultural wastewater.

PURPOSES

- To remove sediments and to reduce total suspended solids from concentrated livestock area runoff.
- To remove sediments and to reduce total suspended solids from agricultural wastewater.

CONDITIONS WHERE PRACTICE APPLIES

Below livestock concentration areas and agricultural wastewater discharges where a reduction of sediments and total suspended solids in runoff or applied wastewater is needed as a component of a waste management system. The maximum contributing uncontrolled drainage area for concentrated livestock areas shall be 0.5 acres. The maximum number of animal units for agricultural wastewater shall be 97 (69 dairy cows). The maximum capacity for food processing water shall be 1000 gal/day.

CONDITIONS WHERE PRACTICE DOES NOT APPLY

Vegetated filter areas, as a single component practice will not satisfy the state water quality standards for direct discharge to waters of the state. More stringent pollution abatement

measures will be necessary where bacteria, dissolved organic materials and/or dissolved nutrients, impair receiving water quality.

This practice does not apply to the management of human waste, silage juices, or other high strength wastes.

This practice does not apply below "Picket Dam" and other slow release waste storage facilities

General criteria applicable to all purposes

Wastewater must be applied evenly (sheet flow) on or along the entire length of the vegetated filter area.

Livestock access and grazing of vegetated filter areas shall be prohibited.

The current NRCS Connecticut / Rhode Island standard for Critical Site Planting (Practice Code 342) shall be used to determine vegetative requirements.

Filter strip establishment shall comply with local, state and federal regulations.

Additional criteria to remove sediments and to reduce total suspended solids from concentrated livestock area runoff

These criteria apply to wastewater treatment areas for runoff from barnyards and feedlots.

Vegetation shall have at least one growing season to become established before wastewater is discharged on the filter area.

An area for settling solids with a restricted outlet that provides a minimum of one-day detention time shall be provided between the waste source and the filter area. The minimum storage

volume for the settling area, in cubic feet, shall be determined by either: multiplying the peak inflow rate in cubic feet per second resulting from a 2-year, 24-hour rainfall by 900 seconds (15 minutes * 60 seconds per minute); or: 2" of runoff from the contributing drainage area whichever is smaller. If the settling area is not cleaned after each significant rainfall event, additional storage for solids shall be provided equivalent to at least 0.1 inches of runoff per month from the contributing drainage area.

The minimum filter area size for concentrated livestock areas shall be determined by a combination of weekly runoff from the wettest long-term monthly precipitation, and infiltration of that runoff into the soil profile. The design runoff from the long-term wettest week shall be calculated using a runoff curve number of 90 for unpaved contributing drainage areas and 97 for paved areas. The infiltration rate shall not exceed two inches per week, or 1.25 gallons/square foot/week, and may be significantly lower depending upon the permeability of the soils in the filter area.

Flow paths within the filter area shall be as flat as practical to insure infiltration of the design runoff. Trenches filled with free draining gravel or crushed stone may be installed to aid in infiltration and decrease the overall size of the filter area. Berming or diking at the perimeter of the filter area, and/or terracing within the filter area to insure infiltration of the design runoff shall be required.

An emergency overflow area shall be provided at the outlet from the filter area to accommodate runoff events, which exceed the design runoff.

The finished grade of the filter area, or the bottom of infiltration trenches if installed, shall be a minimum of two feet above the seasonal high groundwater elevation.

There shall be a minimum of 4 feet between finished grade and bedrock unless an impervious lining is provided.

Land areas upon which filter areas are constructed shall be no steeper than 4%.

Level spreader dikes or infiltration trenches shall be spaced at 50-foot intervals or less in the filter area to maintain an even distribution of wastewater (sheet flow). Level spreader dikes

shall be constructed of ASTM C-33 size number 357 crushed stone or gravel.

Additional criteria to remove sediments and to reduce total suspended solids from agricultural wastewater

These criteria apply to filter areas for wastewater from milk parlors, milking centers and food processing plants.

Vegetation shall have at least one growing season to become established before wastewater is discharged on the filter area.

Provide a storage area with a minimum of one-day detention time for floatable and settleable solids.

The minimum filter area size for agricultural wastewater shall be based upon a combination of the design inflow (not to exceed 7000 gallons/week), and infiltration of that inflow into the soil profile. The infiltration rate shall not exceed two inches per week, or 1.25 gallons/square foot/week, and may be significantly lower depending upon the permeability of the soils in the filter area.

Flow paths within the filter area shall be as flat as practical to insure infiltration of the design inflow. Trenches filled with free draining gravel or crushed stone may be installed to aid in infiltration and decrease the overall size of the filter area. Berming or diking at the perimeter of the filter area and/or terracing within the filter area to insure infiltration of the design inflow shall be required.

An emergency overflow area shall be provided at the outlet from the filter area to accommodate events that exceed the design inflow.

The finished grade of the filter area, or the bottom of infiltration trenches if installed, shall be a minimum of two feet above the seasonal high groundwater elevation.

There shall be a minimum of 4 feet between finished grade and bedrock.

Land areas upon which filter areas are constructed shall be no steeper than 4%.

Level spreaders shall be spaced at 50-foot intervals or less in the filter area to maintain an even distribution of wastewater (sheet flow). Level spreader dikes shall be constructed of

ASTM C-33 size number 357 crushed stone or gravel.

CONSIDERATIONS

General

An even distribution of wastewater can be established or maintained through the use of level spreaders. Stone filled trenches, stone berms alone, or above ground perforated pipes are preferred methods for establishing sheet flow.

Clean water should be diverted around the contributing uncontrolled drainage area and the filter area to the maximum extent possible.

Mowing and/or harvesting may be necessary to maintain the purpose of the filter area

Concentrated Livestock Areas and Agricultural Wastewater

Consider the greatly reduced effectiveness of filter areas under snow or frozen conditions.

Sprinklers can be used to distribute flow uniformly over the filter area.

Make provisions to prevent direct discharges of polluted water from vegetated filter areas to streams, ditches, grassed waterways and other water resources.

PLANS AND SPECIFICATIONS

Plans and specifications for filter areas shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Based on this standard, plans and specifications shall be prepared for each specific field site where a filter strip will be installed. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan for the vegetated filter area will be prepared. Prior to construction, sufficient copies of the O&M plan shall be provided to the owner/operator, designer, and approving agencies. The owner shall sign the O&M plan to indicate an understanding of the requirements and a commitment to operate and maintain the facility as specified.

The O&M plan shall contain as a minimum:

1. Initial establishment and maintenance of a dense vigorous vegetative stand at least one growing season prior to wastewater discharge.
2. Removal of sediments, organic solids, or debris.
3. Inspection after major storm events, and at least quarterly.
4. Timely repair of any erosion rills, channels, berms, or trenches to restore sheet flow.

For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.

Control undesired weed species, especially state-listed noxious weeds.

Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, reseed disturbed areas, and take other measures to prevent concentrated flow through the filter strip

To maintain or restore the filter strip's function, periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed.