

# Engineering Update

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# Outline

- (635) Vegetated Treatment Area
- (360) Waste Facility Closure
- (313) Waste Storage Facility
- (367) Roofs and Covers



# Vegetated Treatment Area



# Vegetated Treatment Area (Sloped VTA and VIB)



# Vegetated Treatment Area

(Gated Pipe delivery system)



# Vegetated Treatment Area (Sprinkler Delivery System)



# 635 - VTA Standard

- “Base the total treatment area for the VTA on the soil’s capacity to infiltrate and retain runoff within the root zone and the vegetation’s agronomic nutrient requirements”
- “Nutrient loading of VTAs shall be based on crop removal of the vegetation used in the VTA.”

# 635 - VTA Standard

- “Design the VTA based on the need to treat the runoff volume from the 25-year, 24-hour storm event from the agricultural animal management facility. Infiltrate a portion or the entire volume of the design storm, based on management objectives.”
- Need a sediment basin
- Protect from 100 year flood plain

# VTA / VTS Technical Note

- [http://efotg.sc.egov.usda.gov/references/public/SD/Design\\_Technical\\_Note\\_SD2009-2.pdf](http://efotg.sc.egov.usda.gov/references/public/SD/Design_Technical_Note_SD2009-2.pdf)
- Technical Note (Released Oct. 2009) includes:
  - Planning info
  - Types of VTAs
  - Vegetation details
  - Design Procedure

# VTA Design Spreadsheet

- <ftp://ftp-fc.sc.egov.usda.gov/SD/www/Technical/Engineering/SD%20VTA%20Design%20Spreadsheet%20V1.1.xlsx>
- User enters feedlot and VTA information, and a minimum VTA size is calculated

# VTA Design Example

- A feedlot with 5 acres of dirt surface and 0.25 acres of concrete surface located in Brookings County. The VTA area will be a Houdek loam soil. Smooth Broam grass will be the dominant species used to seed the VTA. What is the minimum required size of the VTA area?

# Vegetated Treatment Area

## (Fact Sheet – SD-FS-58)

United States Department of Agriculture

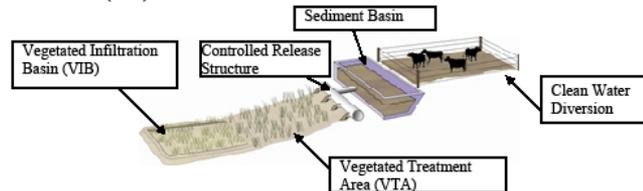


### Vegetative Treatment Systems Alternative Treatment Options for Animal Feeding Operations

SD-FS-58  
April 2009

#### What is a Vegetative Treatment System ?

A Vegetative Treatment System (VTS) is a new alternative treatment option for treating the runoff from an animal feeding operation in an effort to protect water quality in South Dakota (SD). A VTS consists of a sediment basin to settle the solids from the feedlot, and uses controlled release of the liquids to a vegetated treatment area (VTA).



The VTA area is commonly confused with vegetative buffer (or filter) strips. A buffer strip is a narrow strip of vegetation (usually 30-60 feet wide) between cropland or a water source, such as a river, lake, or stream. In contrast, a VTA is a specifically sized area of perennial vegetation to which runoff from a barnyard or feedlot is applied uniformly. The VTA utilizes the water holding capacity of the soil to store the runoff water until the nutrients and water can be used by the vegetation. Therefore, the application of the runoff to the VTA must be at a rate to prevent deep percolation below the root zone, and not allow the flow to extend past the end of the VTA.

#### Advantages

- May provide lower initial investment and operating costs
- More aesthetically palatable than large ponds
- No long-term storage of runoff required, such as holding or evaporation ponds
- Fewer safety issues
- Land designated for VTA can produce usable forage

#### Disadvantages

- A VTA may not be a "closed" system; saturated soils from previous rains could allow a discharge
- Special management required during runoff events
- The VTAs can be damaged by a lack of maintenance and attention - gullies, erosion, and poor vegetation stands dramatically reduce their effectiveness
- Not currently permissible in SD by the Department of Environment and Natural Resources
- The VTAs may not provide the same level of water quality improvement as a total runoff containment system, such as holding or evaporation ponds provide

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# Vegetated Treatment Area

- The VTA / VTS fact sheet is located at:
- [ftp://ftp-fc.sc.egov.usda.gov/SD/www/News/FactSheets/SD-FS-58\\_VTS.pdf](ftp://ftp-fc.sc.egov.usda.gov/SD/www/News/FactSheets/SD-FS-58_VTS.pdf)

# Vegetated Treatment Area

- VTA EQIP practice payments are made by:
  - Leveled VTA
  - Non-Leveled VTA
  - Portable Sprinkler VTA
  - Permanent Sprinkler VTA
- Practice Payments are made by acres

# 360 – Waste Facility Closure

- Feedlot Reclamation (New in EQIP FY 2012)
- Partial Open Feedlot Reclamation
  - Includes payment for removal of manure/soil surface and leveling/shaping
- Full Open Feedlot Reclamation
  - Partial Open Feedlot Reclamation plus removal of fences, feed bunks, feed bunk pads, waterers
- Practice Payments are made by acres

# 313 - Waste Storage Facility

- Additional Criteria For Solid Manure Storage Facilities
  - 5 Choices of Floor requirements
  - Design Storage Requirements
    - Manure/Bedding
    - Runoff (if not under a roof)
    - No residual storage or freeboard required for solid manure storage facility

# 313 – Waste Storage Facility

- For Roofed Structures (bedded pack barns, hoop barns, monoslope barns) practice payments are made by:
  - Clay Lined Floor for bedded pack roofed structure
  - Concrete Floor for bedded pack roofed structure
- These 2 payment scenarios are not a facility that is partially covered by a roof
- Practice Payments are made by animal units

# 367 – Roofs and Covers

- New South Dakota standard in October 2011
- Additional Criteria for Rigid and Semi-rigid Roofs and Covers
  - ASCE 7 snow and wind load criteria
- Additional Criteria For Roofed Animal Production Facilities (solid manure)
  - References manure volume requirements in the 313 standard
  - Animal Space Requirements

# 367 – Roofs and Covers

- For a Roofed Structures (bedded pack barns, hoop barns, monoslope barns, deep pit slurry/liquid barn) practice payments are made by:
  - Livestock Roofed Structure
- This payment scenario is not a facility that is partially covered by a roof
- Practice Payments are made by animal units

# 367 – Roofs and Covers

- Design criteria information on Bedded Pack barns will be included in a separate presentation

# Questions?

