



**Targeted Constituents**

● Significant Benefit		◐ Partial Benefit		○ Low or Unknown Benefit	
● Sediment	○ Heavy Metals	○ Floatable Materials	◐ Oxygen Demanding Substances		
● Nutrients	● Toxic Materials	○ Oil & Grease	● Bacteria & Viruses	○ Construction Wastes	

**Description** Small farms, pastures, cropland and other agricultural lands are potential sources of water quality degradation from a number of factors, particularly when located near a natural stream, storm drainage system, or other runoff conveyance. Common-sense approaches will minimize water quality impacts, improve neighborhood relationships, and satisfy legal obligations. Potential impacts include: soil erosion, overuse of chemicals such as pesticides and fertilizers, animal waste discharges, meat or dairy processing activities, etc.

**Approach** Large and medium farms are governed by state rules and regulations from the Tennessee Department of Agriculture (TDA) and the Tennessee Department of Environment and Conservation (TDEC). In particular, TDA and TDEC focuses on certain land uses defined as an Animal Feeding Operation (AFO) or a Concentrated Animal Feeding Operation (CAFO). See the TDEC permit webpage at

<http://www.state.tn.us/environment/permits/> and the TDA webpage at <http://www.state.tn.us/agriculture/> for definitions and permit requirements.

Small farms and agricultural lands must also meet the basic state standards for not polluting waters of the state, creating a public nuisance, or harming the environment and wildlife. Common-sense solutions to protect stormwater quality involve the efficient use of land, materials and topography - the very things that farmers strive for. Good housekeeping procedures and storage methods will greatly reduce the potential for stormwater pollution, leaks and spills.

Due to federal mandates, the City of Knoxville adopted a Stormwater and Street Ordinance to prohibit discharge of soil, sediment, chemicals, debris, animal or human wastes (see IC-01, Non-Stormwater Discharges to Storm Drains) into streets, ditches, storm drains, creeks and streams. This prohibition includes: chlorinated water, any soil or mulch, fertilizers, pesticides, nutrients such as fertilizer and lime, animal wastes, hay or straw clippings, meat or dairy processing wastes, etc. In addition to being toxic, these substances change the pH, oxygen and turbidity of natural creeks and streams. Damage from toxic materials can take months or years to accumulate

- Guidelines**
- Create buffer zones near natural creeks, streams, wetlands, public waterways and drainage ditches. A typical buffer zone width of 25 feet will allow grass, trees and shrubs to protect waterways by filtering sediments, absorbing nutrients, and reducing toxic substances and heavy metals.
  - When using natural streams and creeks as a source of water for animals, limit the potential for animals to urinate or defecate directly into the water. Reduce potential

for animals to cross the creek or waterway repeatedly, or to otherwise disturb the channel by causing erosion. Locate fences to protect waterways.

- Plan all activities and operations to minimize the potential for stormwater contact, spills, leaks, and exposure to the weather. It may be helpful to create a property map that shows the location of all creeks, streams, wetlands, sinkholes and drainage ditches in relation to pastures, crops, buildings, barns and other structures. Limit the amount and types of activities that occur in floodplains or flooded areas.
  - Store materials and supplies away from the weather, typically either inside a structure (shed, barn) or protected with tarps. Construct a small bermed or depression area on the downstream side to prevent offsite movement of loose bulk materials.
  - Store animal wastes (manure) at locations away from creeks, drainage channels, ponds, sinkholes and other environmentally sensitive areas. Minimize potential for stormwater impact if possible by storing under a tarp or roof (such as a barn).
  - Do not use more water than the soils and crops can absorb. Excess water damages the plowed cropland by washing away the nutrients and soil. Lower the flow rate and increase watering time as necessary to avoid overland discharge.
  - Use herbicides, pesticides and fertilizers responsibly in accordance with manufacturer's instructions. Do not overapply these hazardous materials; this would be the equivalent of pouring toxic chemicals directly into the natural streams and creeks. Herbicides and pesticides should be applied after rainfall or watering occurs, and a dry period of a few days is expected.
- Maintenance**
- Review farm operations regularly to ensure that stormwater pollution is not occurring. The farm operator or landowner should occasionally inspect the property during large rainfall events to become aware of drainage problems.
  - Maintain records for hazardous materials and chemicals (such as quantity purchased, instructions, chemical name, etc). Properly control all materials using responsible farm management principles.

**Related BMPs**

These BMPs are also related to farm management and agricultural lands:

- AM-01 Employee Training (with a table for waste disposal alternatives)
- AM-13 Pesticides, Herbicides, and Fertilizer Use
- ES-04 Gradient Terraces
- ES-05 Surface Roughening
- IC-01 Non-Stormwater Discharges to Storm Drains
- IC-02 Outdoor Loading and Unloading of Materials
- ST-05 Filter Strips and Swales

**References**

- 31, 32** (see BMP Manual Chapter 10 for list)
- TDA website -- <http://www.state.tn.us/agriculture> -- Forestry BMP rules, pesticides
- TDEC website -- <http://www.state.tn.us/environment/permits> -- CAFO general permit
- UT Agricultural Extension Service -- <http://www.utextension.utk.edu/> --  
Farm management, pest management, environment and natural resources