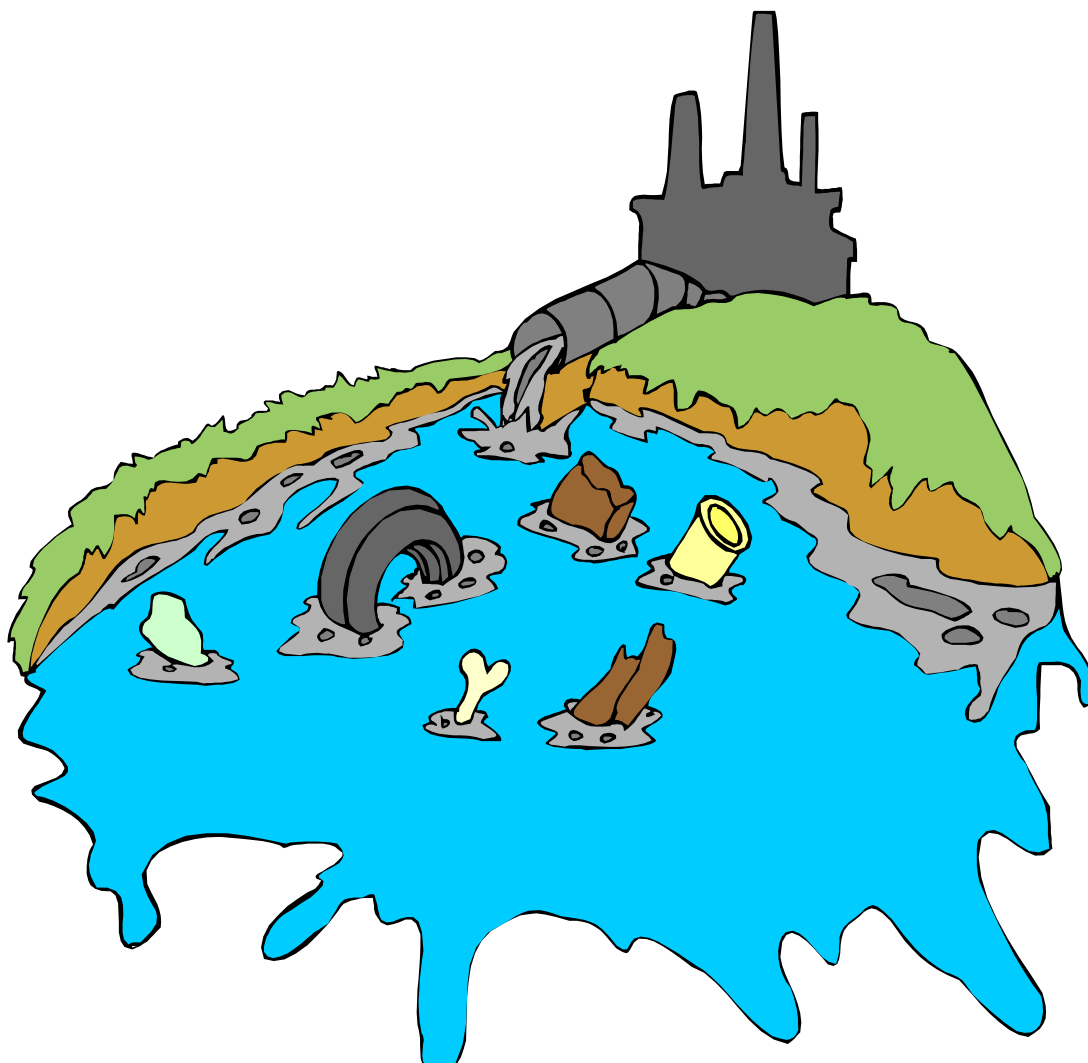




The Construction General Permit and Erosion Prevention and Sedimentation Control

Presented at the Tennessee Gas Association Conference – April 23, 2008

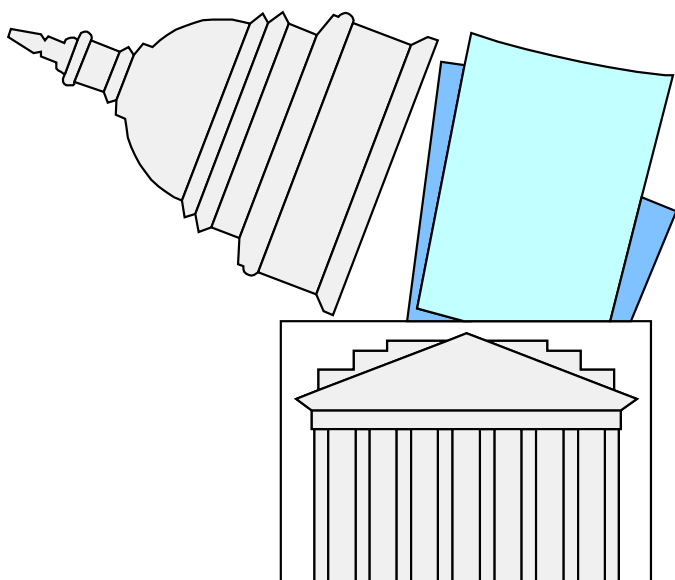


More than
thirty years
ago, **two-third**
of the nation's
waters were
unsafe for uses
such as fishing
and swimming.



National Pollutant Discharge Elimination System (NPDES) Program

To improve water quality,
the **National Pollutant
Discharge Elimination
System (NPDES) Program**
was established to
prohibit the discharge of
pollutants through a **point
source** unless covered
under a permit.



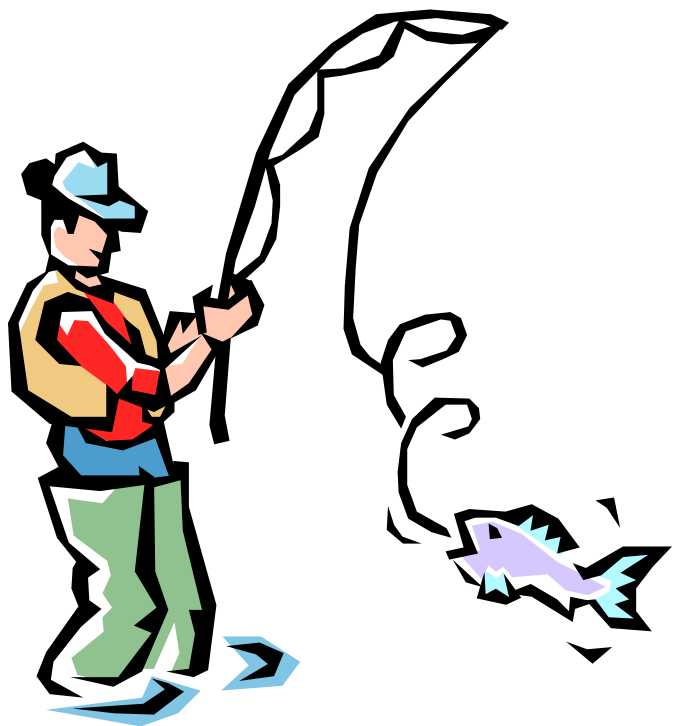
What is a Point Source?



A **point source** is any discrete conveyance, such as a pipe, ditch, channel, tunnel, conduit or container. Point sources include discharges from sewage treatment plants, industrial activities and vessels.



Non-Point Source Pollution



The next step in water quality protection came when the **NPDES Storm Water Program** was implemented to specifically address **non-point source pollution**.

What is Non-Point Source Pollution?

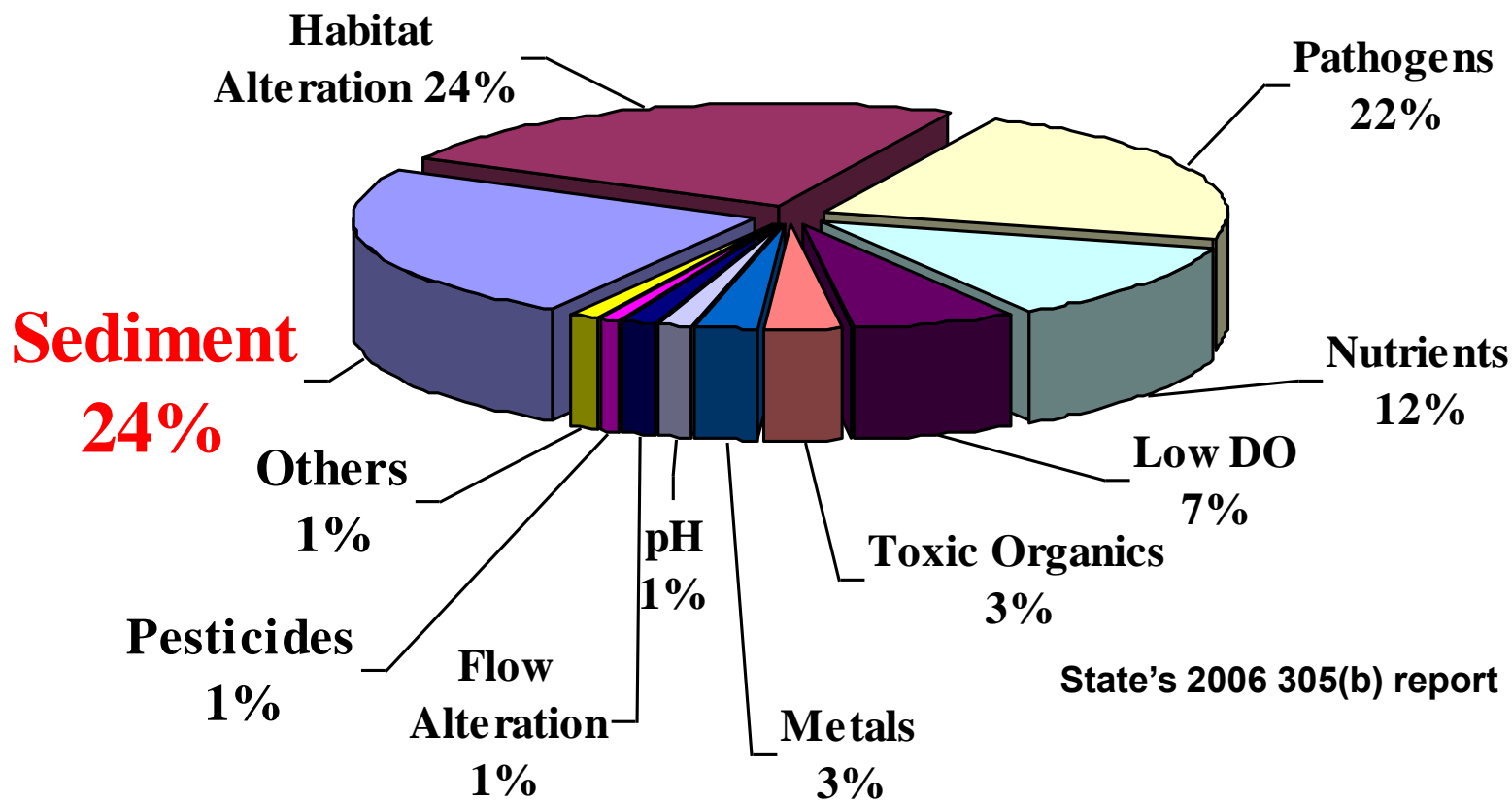


Non-Point Source pollution is storm water runoff moving over the ground picking up pollutants and flowing into our rivers, lakes, wetlands and sources of drinking water.



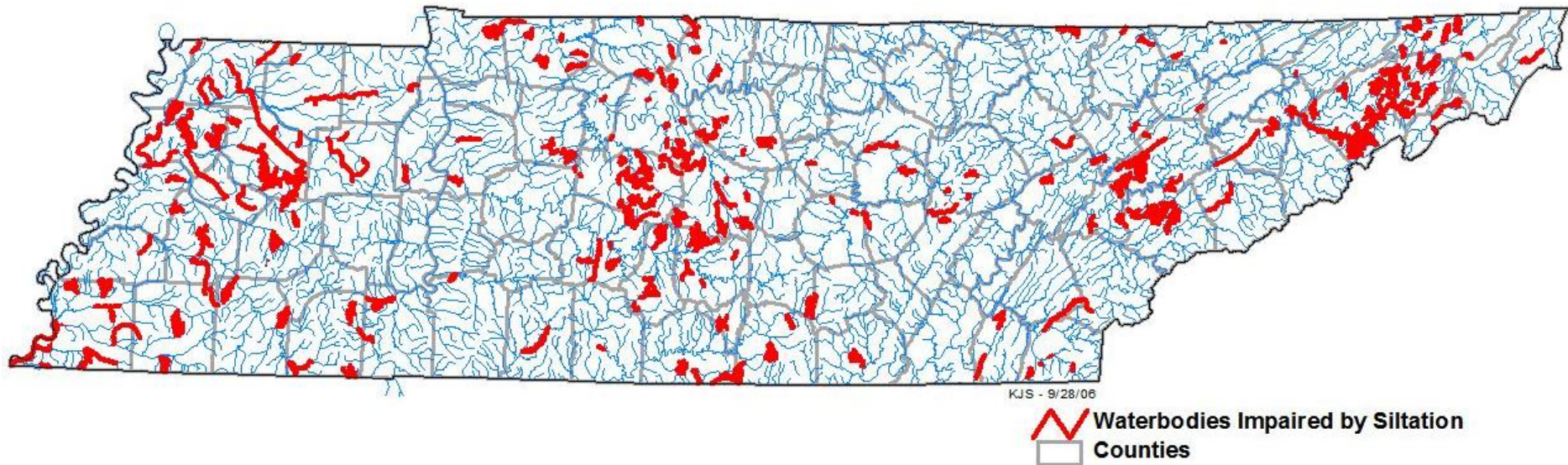
While the impact of an individual nonpoint source may be small, the **cumulative effect can kill aquatic life, limit the use of waters for consumption, recreation, and other purposes.**

Siltation is the number one non-point source pollutant in our creeks and streams



State's 2006 305(b) report

The effects of **siltation** currently impact **5,800** stream miles and **18,000** lake acres in Tennessee.



Siltation causes impairment by altering the waters **physical, chemical** and **biological** properties.



Siltation also has a significant **economic** impact due to increased water treatment costs, system maintenance and flooding.



Siltation and the Erosion Process

There are Two Types of Erosion

Natural

- wind, water, ice and gravity
- slow and continual
- produces 30% of all sediment in US

Accelerated

- destroys natural vegetation
- alters contour of the ground
- produces 70% of all sediment in US

Examples of Erosion:



Stream channel erosion is due to increased runoff volume and velocity and removal of natural vegetation resulting in channel degradation and sedimentation.

Examples of Erosion:



Shoreline erosion is due to wave action and removal of native vegetation resulting in bank instability and sedimentation.

Examples of Erosion:



Overland erosion is caused by land disturbance activities and removal of vegetation. Erosion progresses from sheet, to rill then gully.

Examples of Erosion:

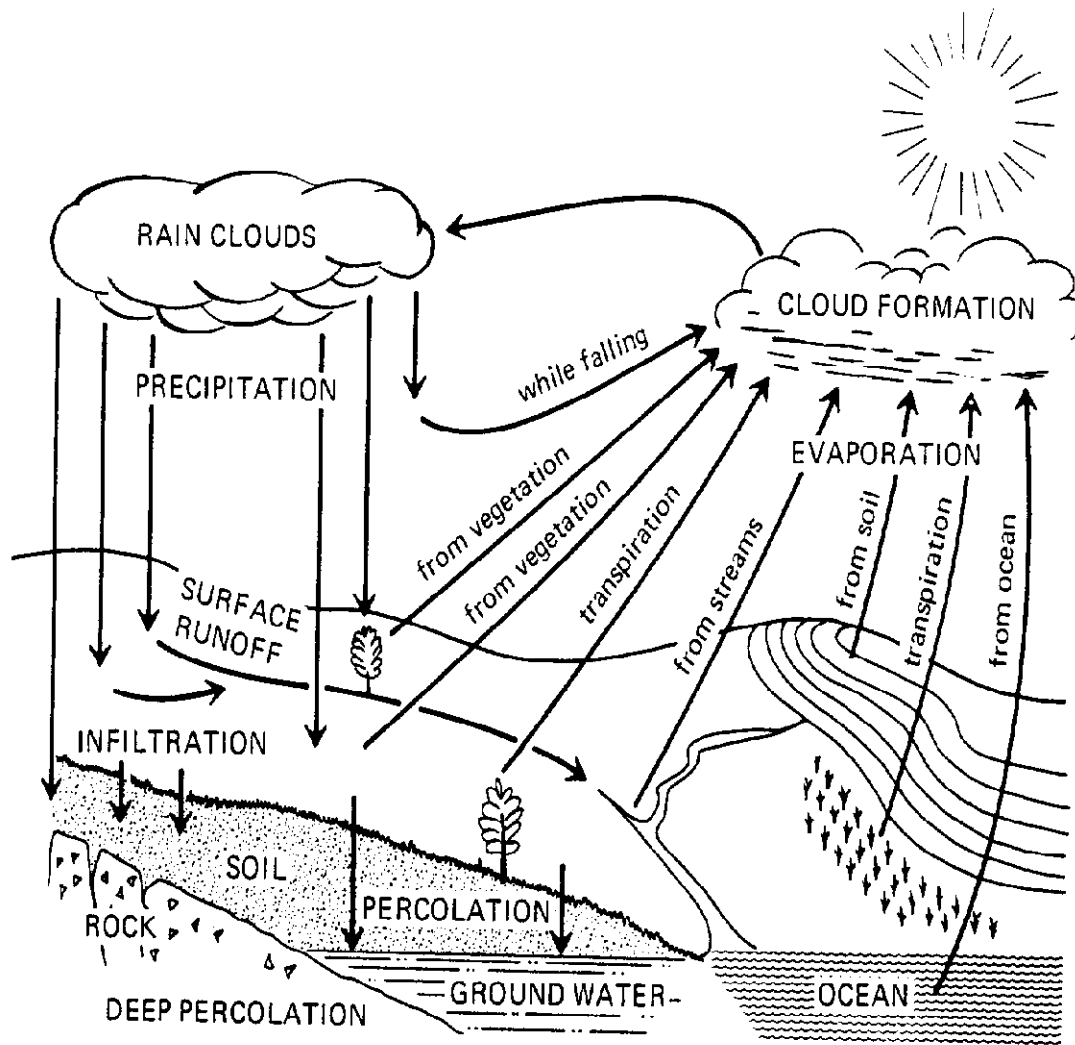


Wind erosion is due to the removal of vegetation resulting in traffic hazards, increased equipment maintenance and nuisance conditions.

Main variables in erosion potential

- **Rainfall**
- **Soil Properties**
- **Length and Steepness of Slope**
- **Vegetation**

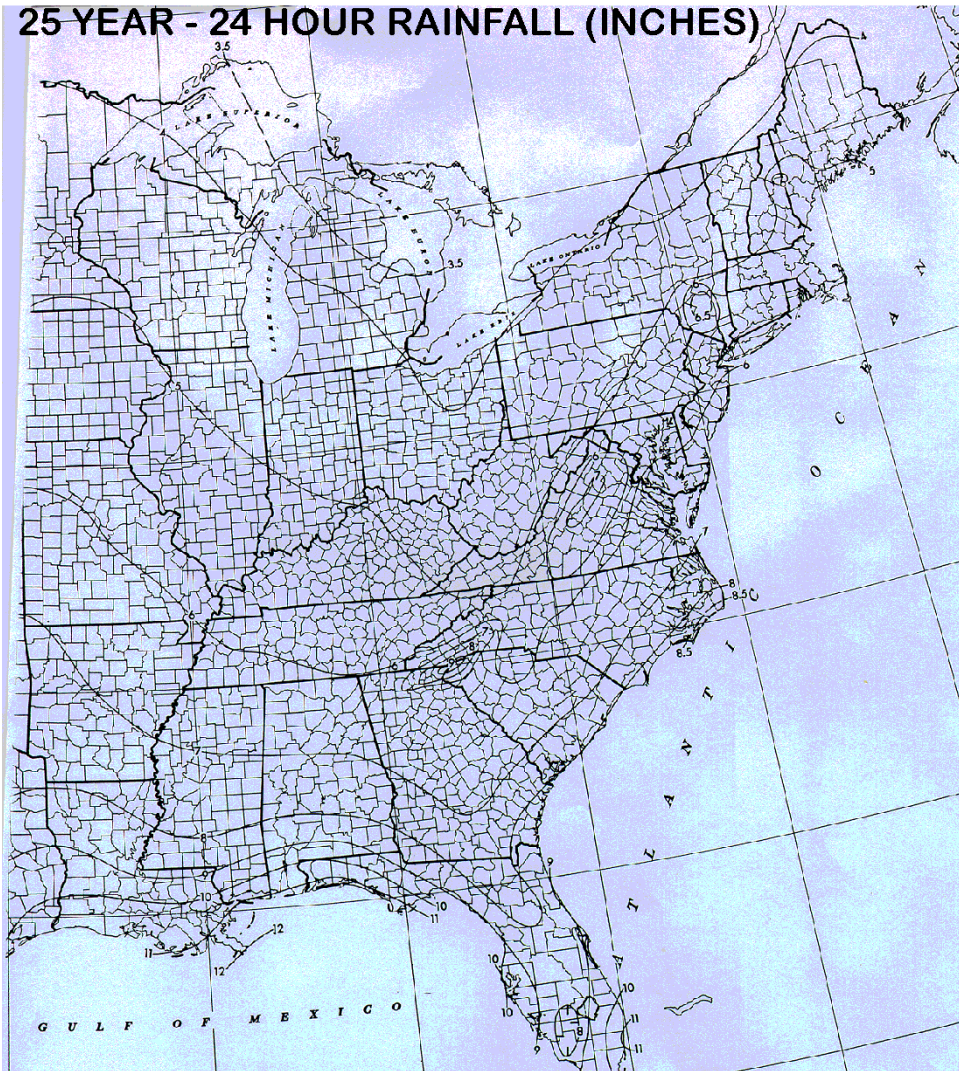
Rainfall



Hydrologic Cycle

The average amount of rainfall in Tennessee is **48 inches per year**. Average volume of rainfall is **1,440,000 gallons per acre** (30,000 gallons per acre per inch of water).

Return Interval



A **return interval** of a 25 year 24 hour storm means the maximum 24-hour rainfall amount with a probable return interval of once in 25 years, or a 4% chance.

In Middle Tennessee a 25 year 24 hour storm is **6 inches**, and a 100 year 24 hour storm is **7 inches**.

Soil Properties



Soil size, structure, texture, weight and shape determines erodibility.

Soils with high concentrations of **silt**, **fine sand** and **clay** are most susceptible to erosion.

Length and Steepness of Slope



The **steeper** the slope, the **faster** the water flows and the greater is its ability to erode soil.

Vegetation




Vegetation provides excellent protection against erosion. It **shields soil** from the rain drop impact, **binds soil** together and **slows run-off** velocities.

When You **Prevent** Erosion, You Have Less Sediment to **Control**

- Minimize erosion by absorbing the raindrop impact energy by using temporary and permanent stabilization
- Slow runoff water down by reducing slope length and steepness, using check dams, diversions, sediment traps, sediment ponds and barriers

Construction Storm Water Permitting



STATE OF TENNESSEE

NPDES PERMIT

GENERAL NPDES PERMIT
FOR DISCHARGES OF STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITIES

PERMIT NO. TNR100000

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the authorization by the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) and the Water Quality Act of 1987, P.L. 100-4, except as provided in part 4.4 (Discharges into Impaired or High Quality Waters) of this general permit, operators of point source discharges of storm water associated with construction activities into waters of the State of Tennessee, are authorized to discharge storm water associated with construction activities in accordance with the following permit monitoring and reporting requirements, effluent limitations, and other provisions as set forth in parts 1 through 8 herein, from the subject outfalls to waters of the State of Tennessee.

This permit is issued on: **June 16, 2005**

This permit is effective on: **June 17, 2005**

This permit expires on: **May 30, 2010**

Paul E. Davis, P.E., Director
Division of Water Pollution Control

CN-0759 RDA's 2352 and 2366

- The construction general permit (**TNCGP**) was issued in 1992 to prevent impairment due to siltation
- Coverage is required for activities with land disturbance **greater than 1 acre** or less if part of a larger common development



The TNCGP requires
implementation,
inspection and
maintenance of
erosion prevention
and sedimentation
controls during land
disturbance activities.

Tennessee's Erosion Prevention and Sediment Control Handbook

TENNESSEE



EROSION & SEDIMENT CONTROL HANDBOOK

A Guide for Protection of State Waters
through the use of Best Management Practices
during Land disturbing Activities



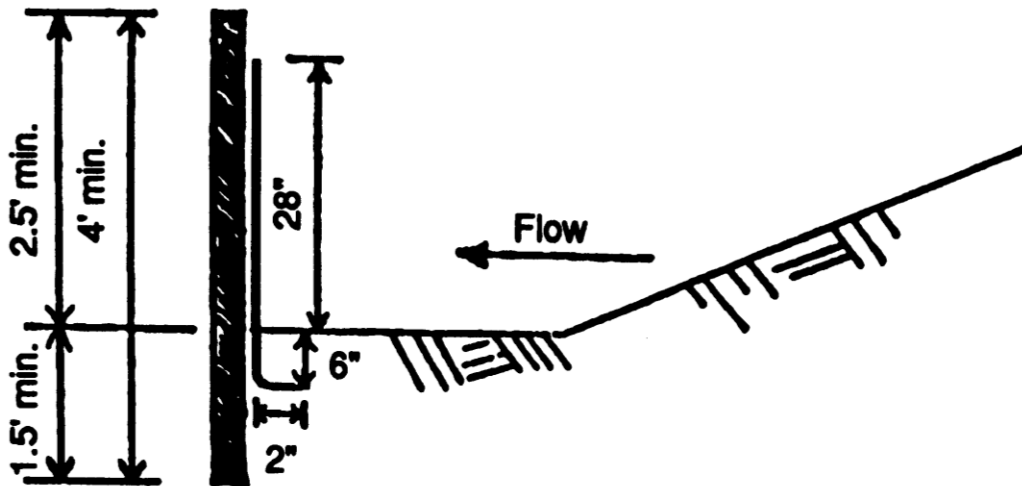
Second Edition

March 2002

- Handbook provides definition, purpose and design criteria for numerous erosion prevention and sediment controls
- Controls are divided into **Structural** and **Vegetative**

Examples of Common Erosion Prevention and Sediment Controls

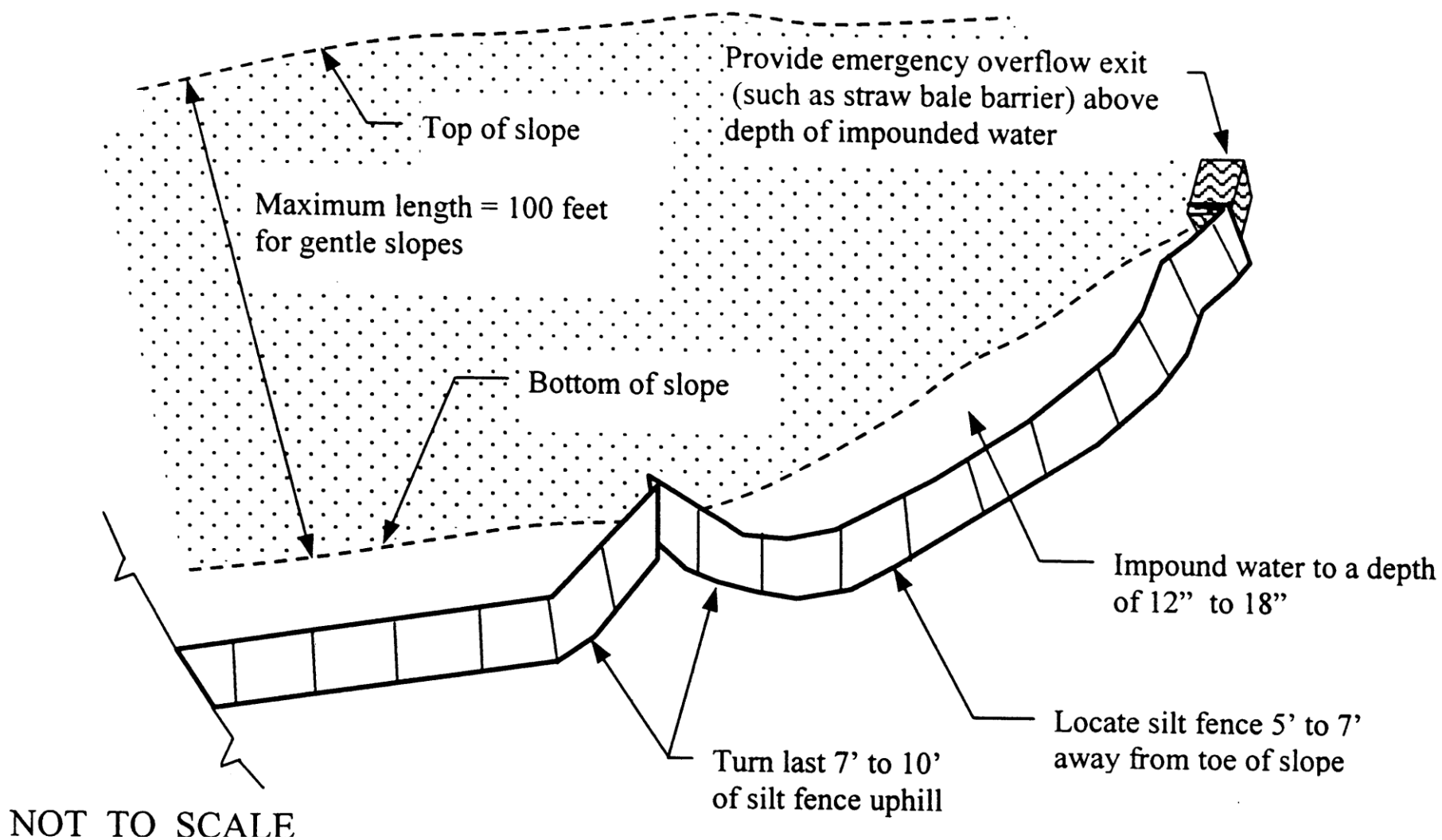
Silt Fence



- Silt fence is a temporary structure constructed of silt fence fabric supported posts
- Must be installed **on contour, trenched, backfilled and compacted**
- Do not install across streams or ditches



Silt Fence Continued

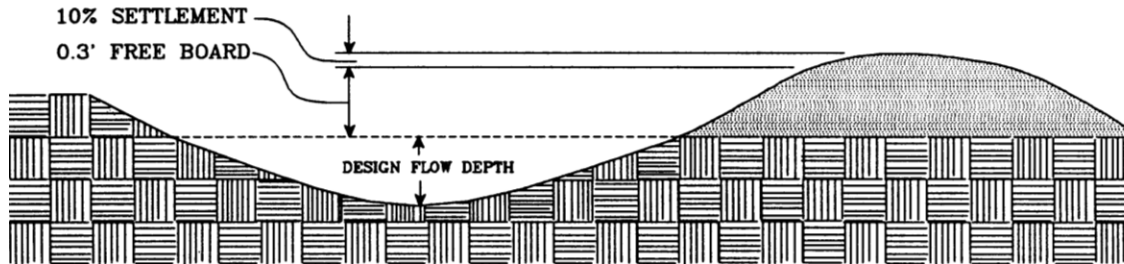


Diversions

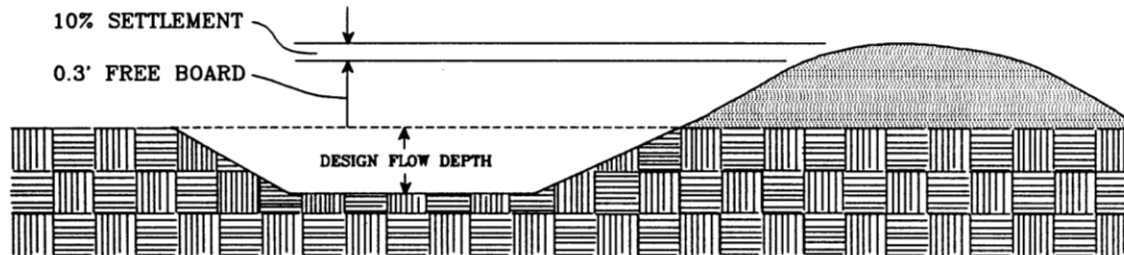


- Use diversions to reduce erosion by **reducing slope lengths and steepness**
- Divert storm runoff to a stable outlet at a non-erosive velocity

Diversions Continued:



TYPICAL PARABOLIC DIVERSION



TYPICAL TRAPEZOIDAL DIVERSION

- A diversion consists of a **ridge** and **channel**
- Diversion channel should be **stabilized** appropriately

Erosion Matting and Blankets

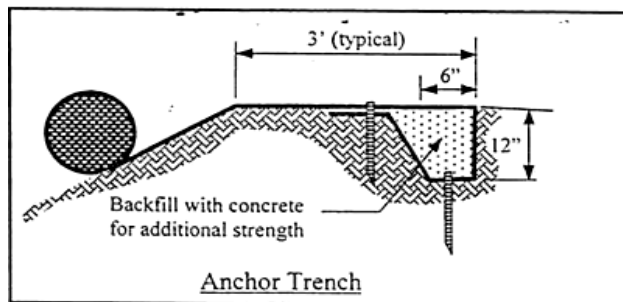
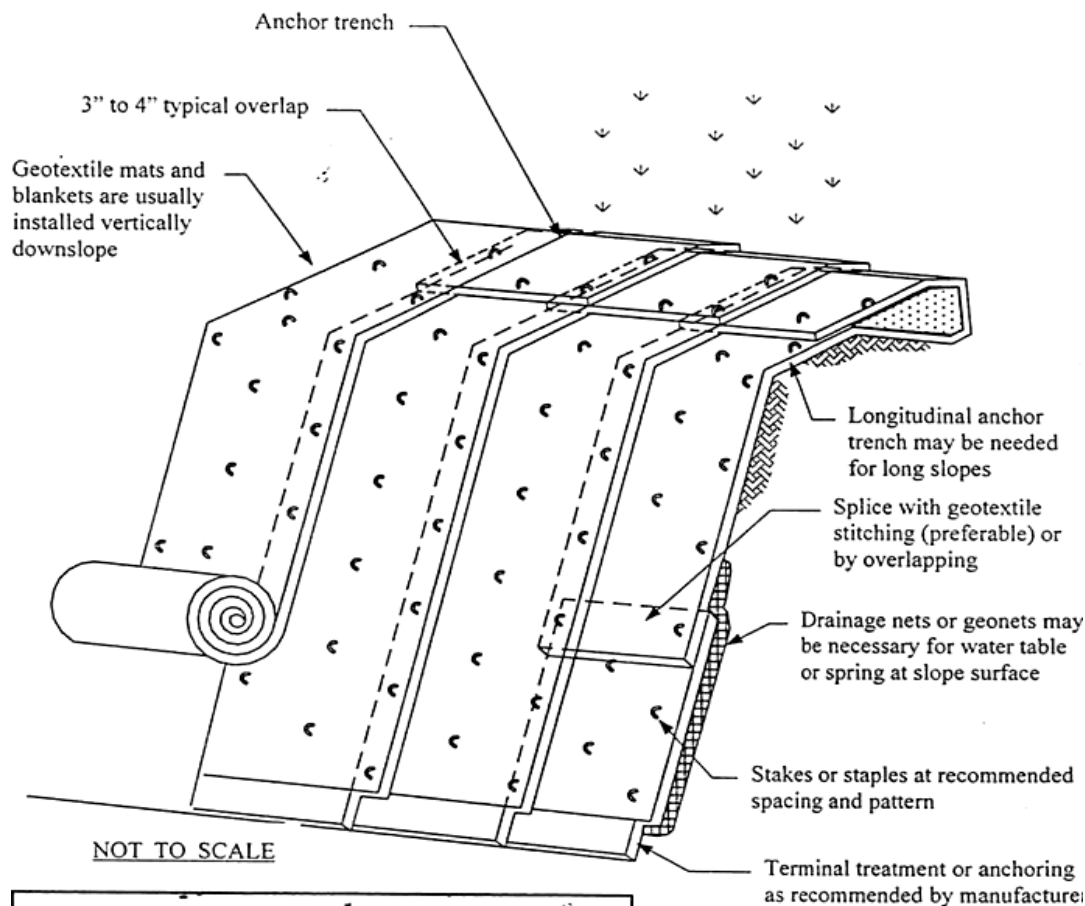


- Matting can be used to stabilize slopes, swales and channels
- Specify matting type by **application** and **install** per manufactures directions





Erosion Matting Continued

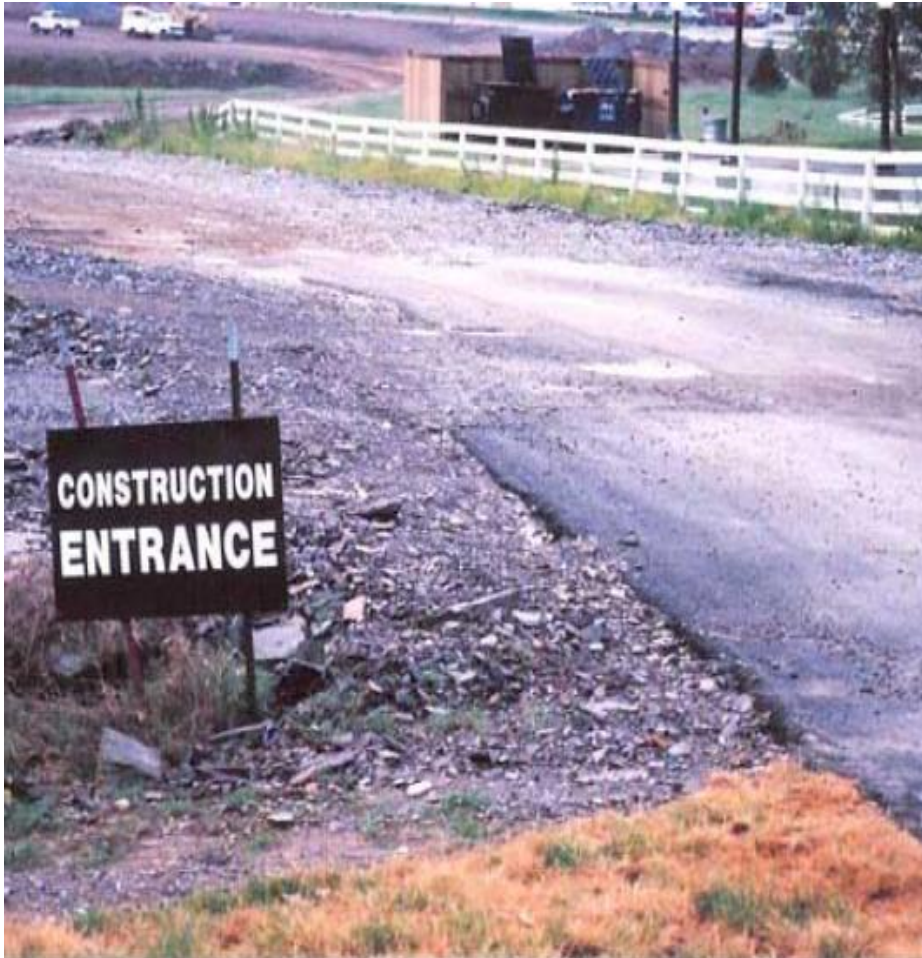


Notes:

1. Stitching geotextile seams is preferable to joints by overlapping. Consult a registered engineer for stability analysis of long grades or grades steeper than 3:1.
2. Staking or stapling layout shall conform to manufacturer's recommendations for flow and grades.

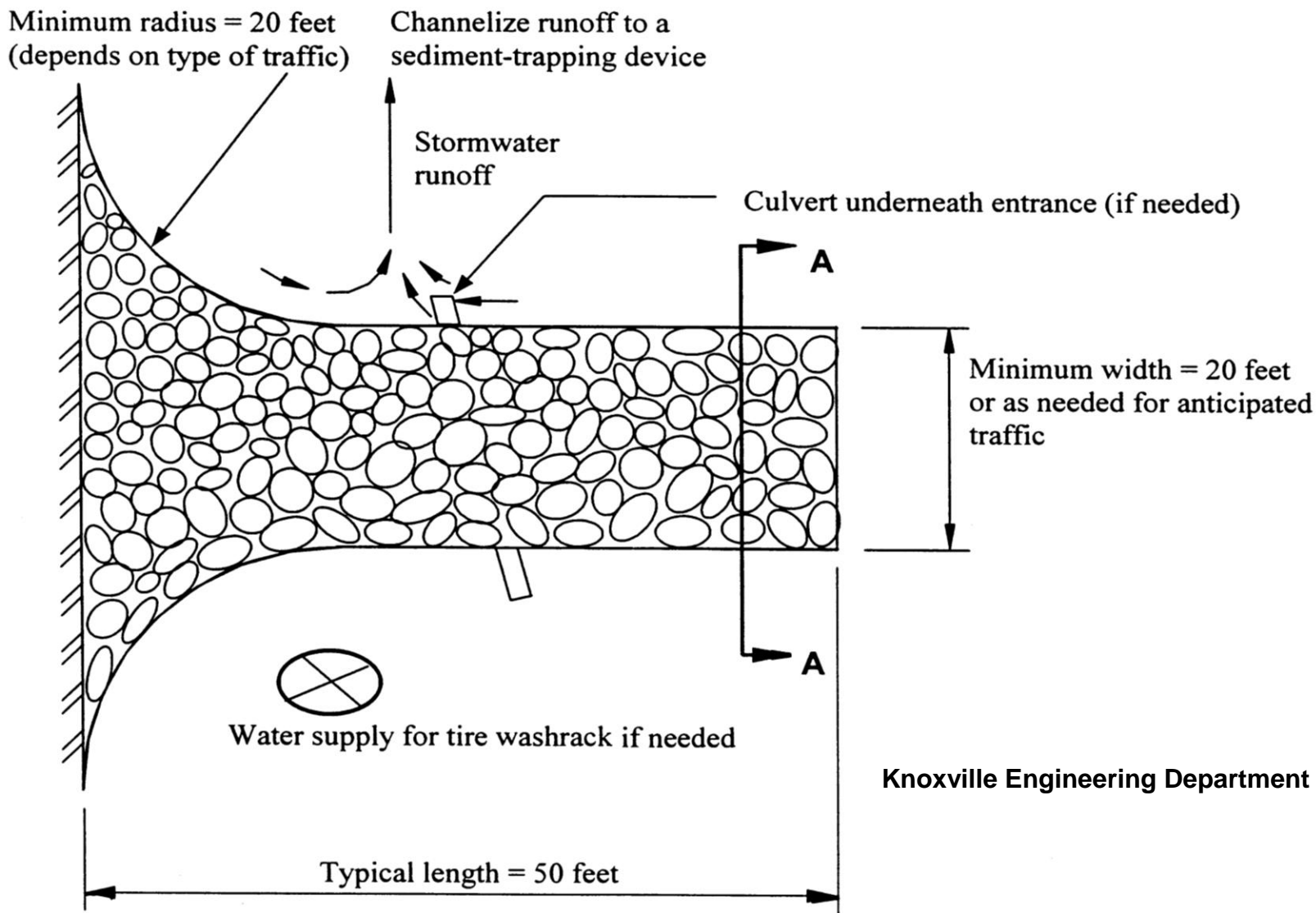
- Matting must be **anchored** by trenching, anchor slots, stakes or staples
- Final grade disturbed areas to ensure **mat to soil contact**

Construction Exit



- 1.5 to 3.5 inch size stone with a **minimum thickness of 6 inches**
- Excavate to a depth of 3 inches
- A **filter fabric** must be placed the full length and width of the exit

Construction Exit Continued



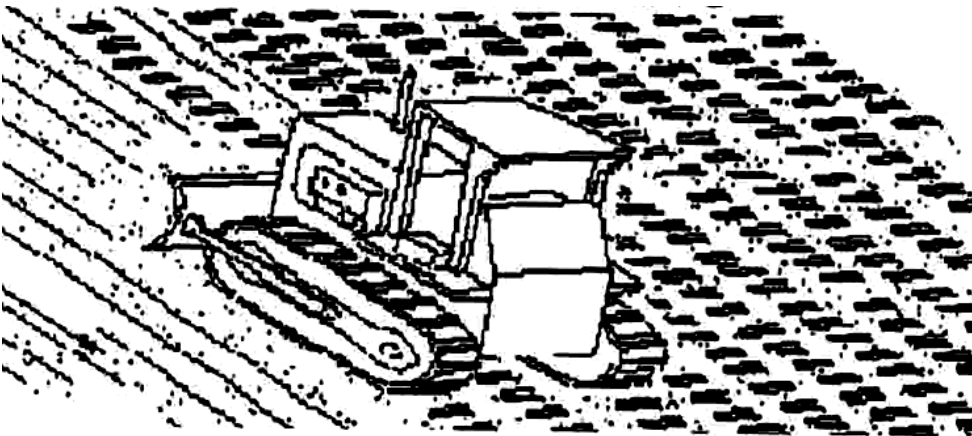
Knoxville Engineering Department

Stabilization with Mulch



- Straw, hay or wood chips will reduce erosion or aid in seed germination
- Implement where construction activities have temporarily or permanently ceased

Stabilization with Seed



- Select seed **suitable** to the **area** and **season** of the year
- Seed can be applied by hand, cyclone seeder, drill or hydraulic seeder
- Track to catch seed and fertilizer in **grooves**



Questions

Thank You....

Robert Karesh

Storm Water Coordinator

Tennessee Department of Environment and Conservation

Division Of Water Pollution Control

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