
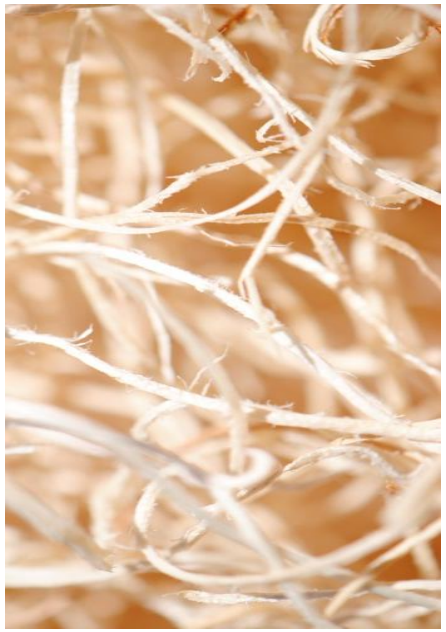

Dam or Filter – What's the Difference When it Comes to Sediment Control?

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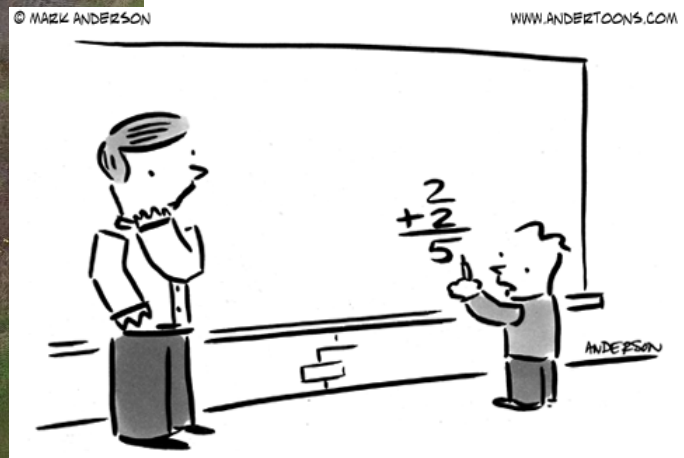
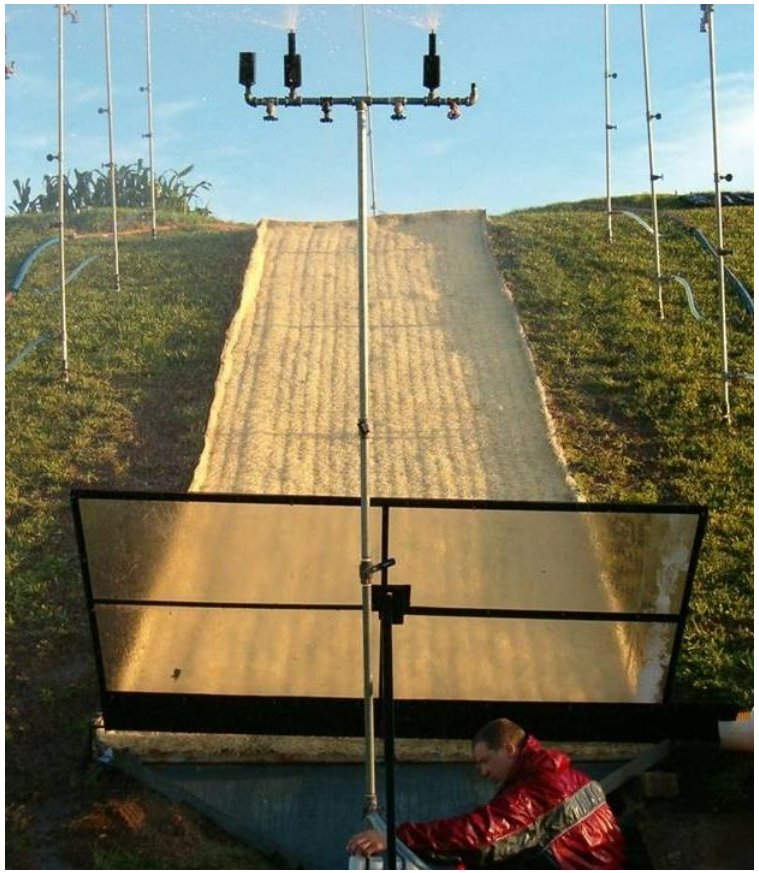
The ErosionLab®



"I prefer to think of it as added value."

ASTM Large-Scale Testing



Erosion Control vs. Sediment Control

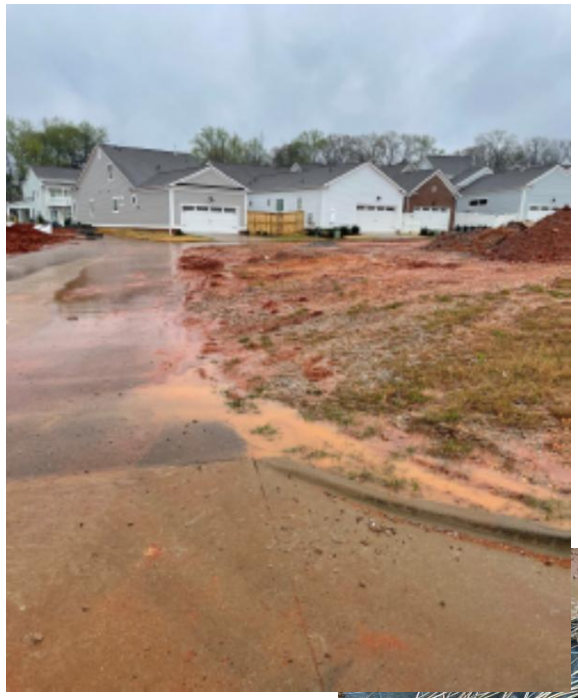
- Erosion Control works to prevent soil from moving (keep it in its place).
- Sediment Control works to remove soil particles that have eroded and are being moved by water.

NOTE: Proper Erosion Control can greatly reduce the need for Sediment Control.

Environmental Protection Agency (EPA) Actions

- **Over the last five years the EPA has issued…**
  - 741 informal enforcement actions
    - for erosion control/stormwater noncompliance.
  - 69 formal enforcement actions for erosion control/stormwater noncompliance.
- **Total penalty dollars $5,538,236.04**

Source: Environmental Protection Agency. (2022, September 21). Facility Search Results. EPA ECHO (Enforcement and Compliance History Online) Facility Search Results. Retrieved April 13, 2023, from https://echo.epa.gov/facilities/facility-search/results



Sediment Control?

These are NOT Good Sediment Control Results

Learning from Mistakes

Sediment Control?

What is Damming vs Filtering?

- **Damming products: flow rate <35 GPM/ft^2 dense products are designed to pool water, but in the process, they commonly reflect and redirect water flow and energy during concentrated flows.**
- **Filtering products: flow rate ≥35 GPM/ft^2 filter by allowing contaminated runoff through their matrices; also provide velocity dissipation when flow rate is exceeded.**

Filter vs. Dam Products

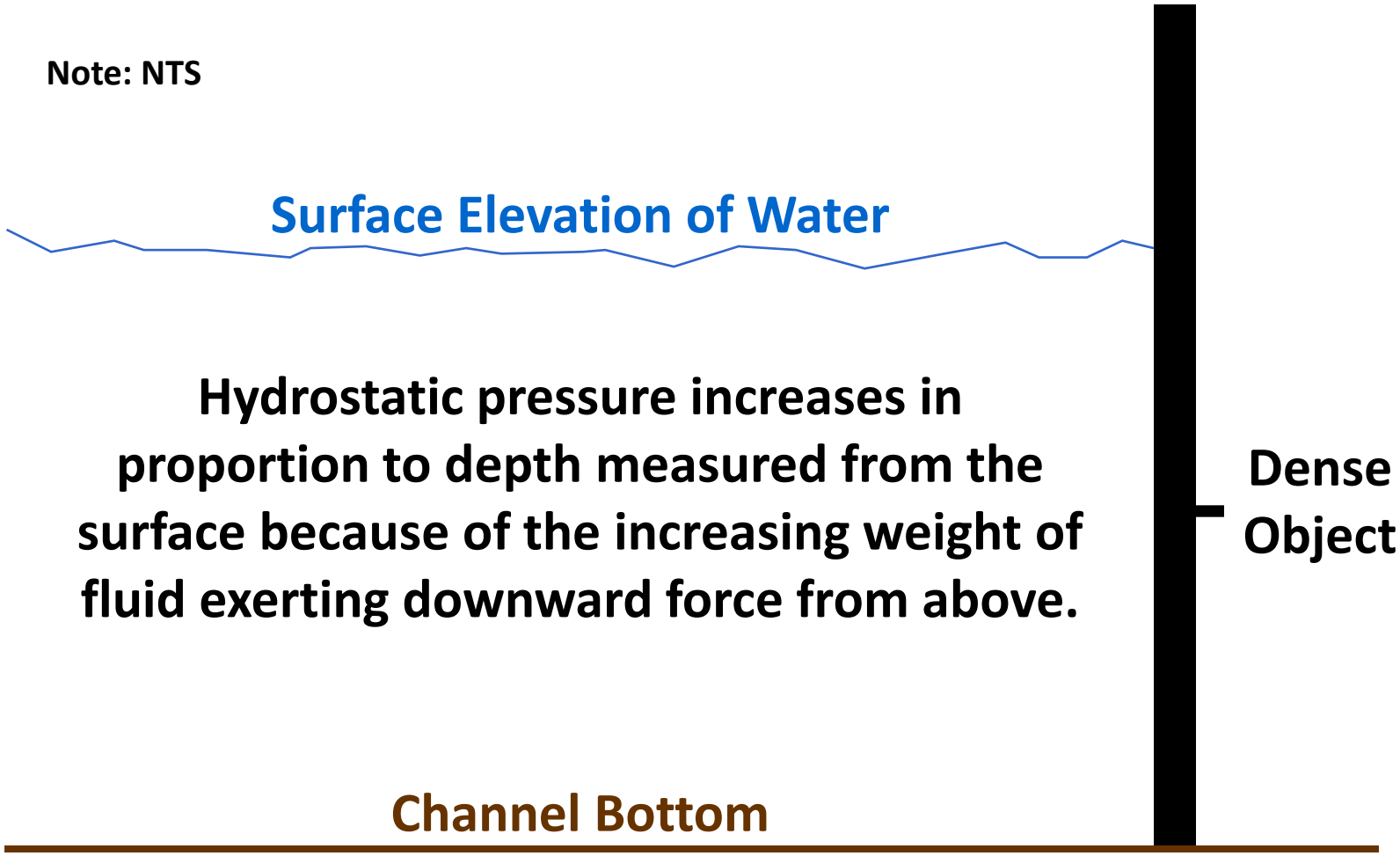
Full Video

Donald, et al. 2014

- Auburn University has completed some fantastic research on ditch checks commonly used on construction sites.
- They discovered that the inclusion of an underlay (i.e. filter fabric) reduced the potential for scour/erosion underneath a practice, thereby maintaining the interface between the practice and channel.
- Their data confirms dense products can be successful in large-scale testing conditions by creating longer subcritical flow areas.

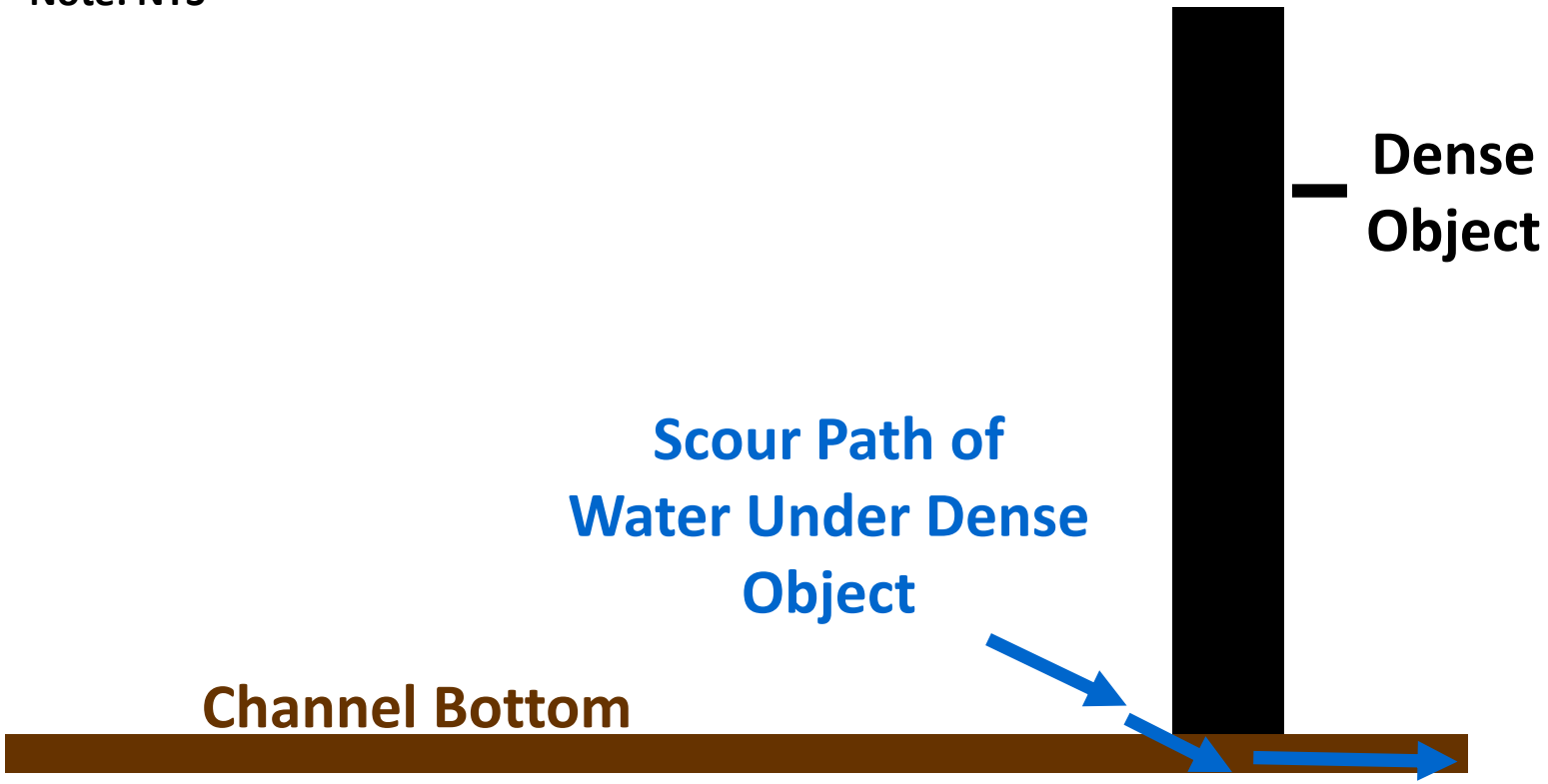
Hydrostatic Pressure

Note: NTS



Possible Scour When Concentrated Flow Hits Dense Object

Note: NTS



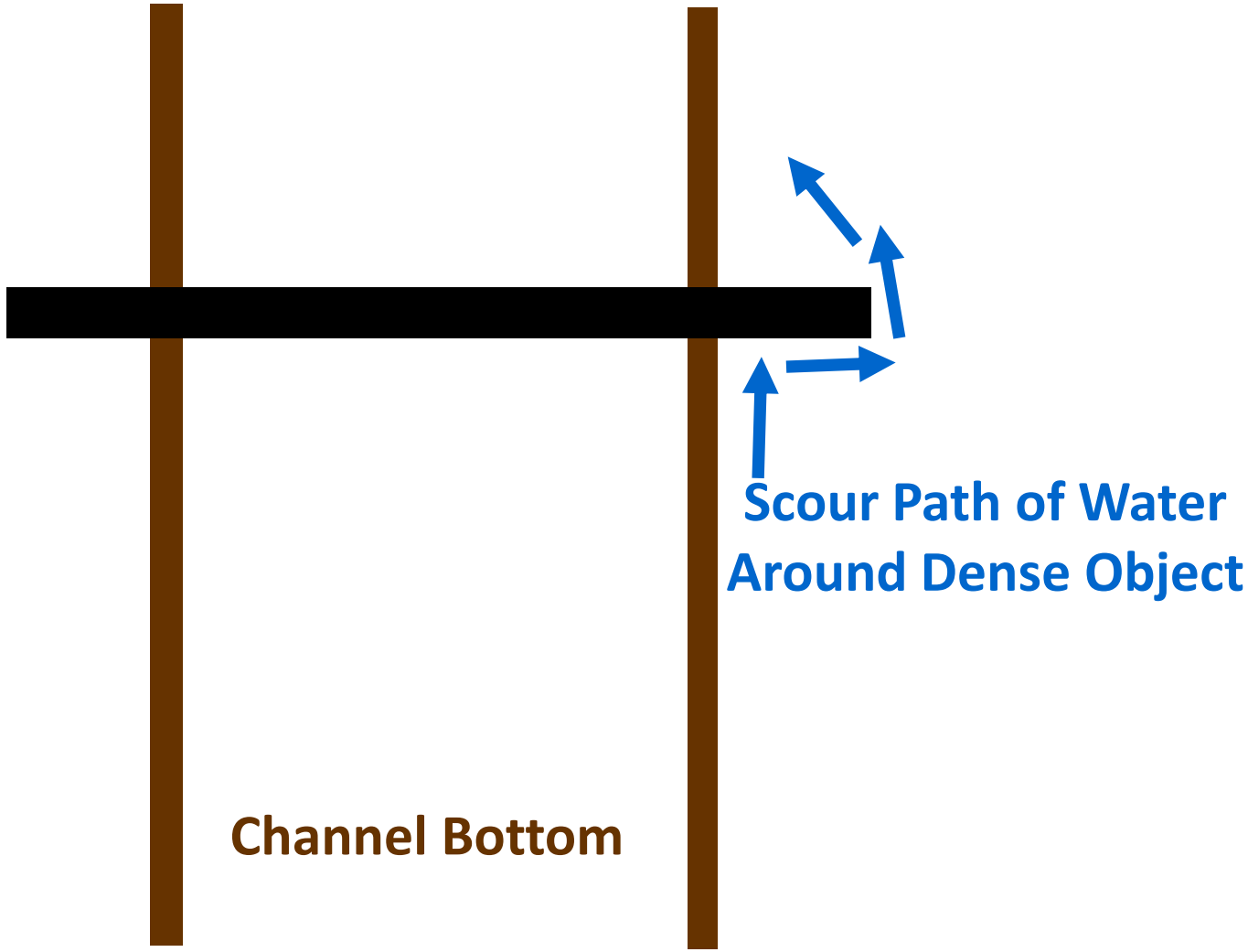
Scour Under

Scour Under

More is not Always Better

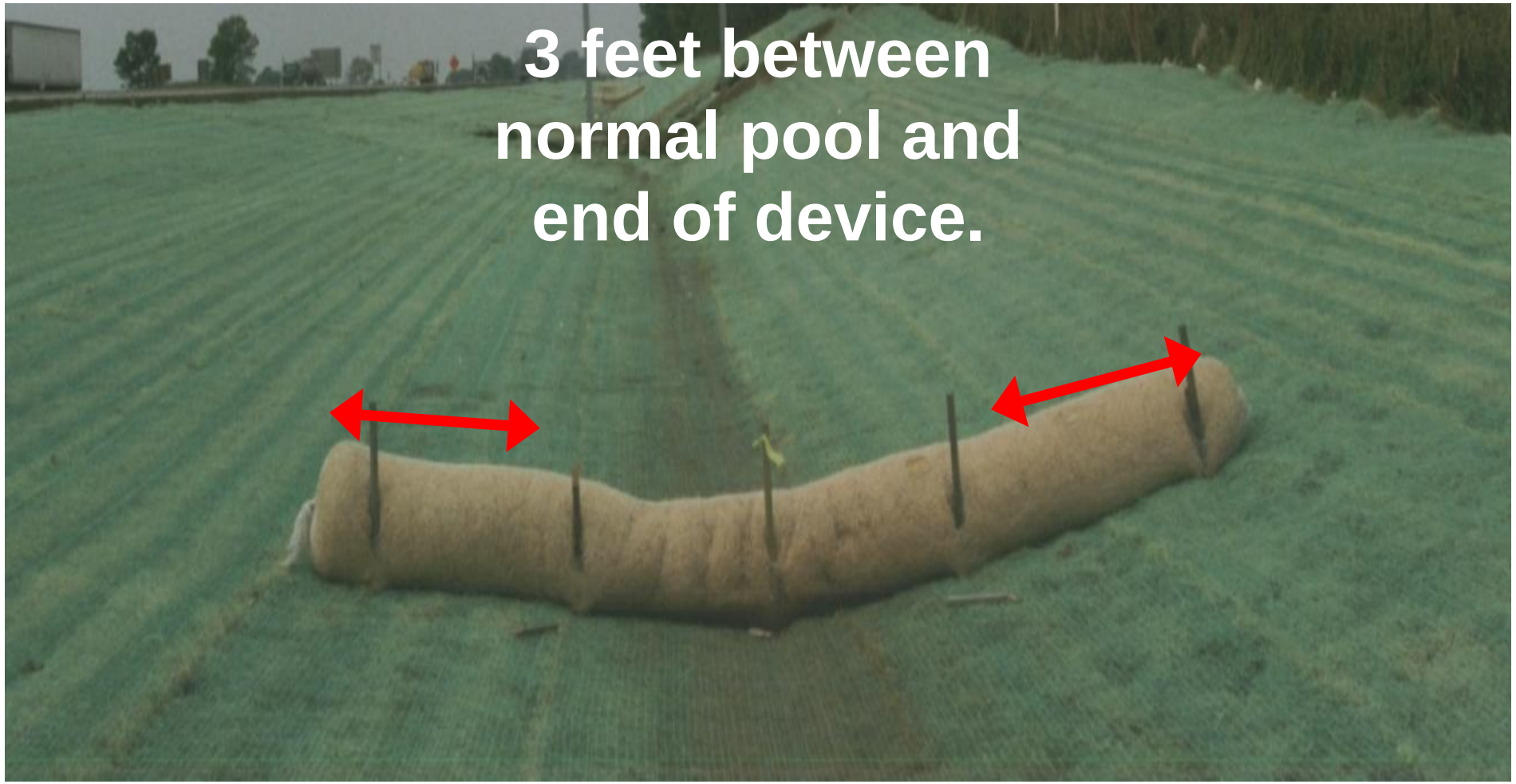
Possible Scour When Concentrated Flow Hits Dense Object

Note: NTS



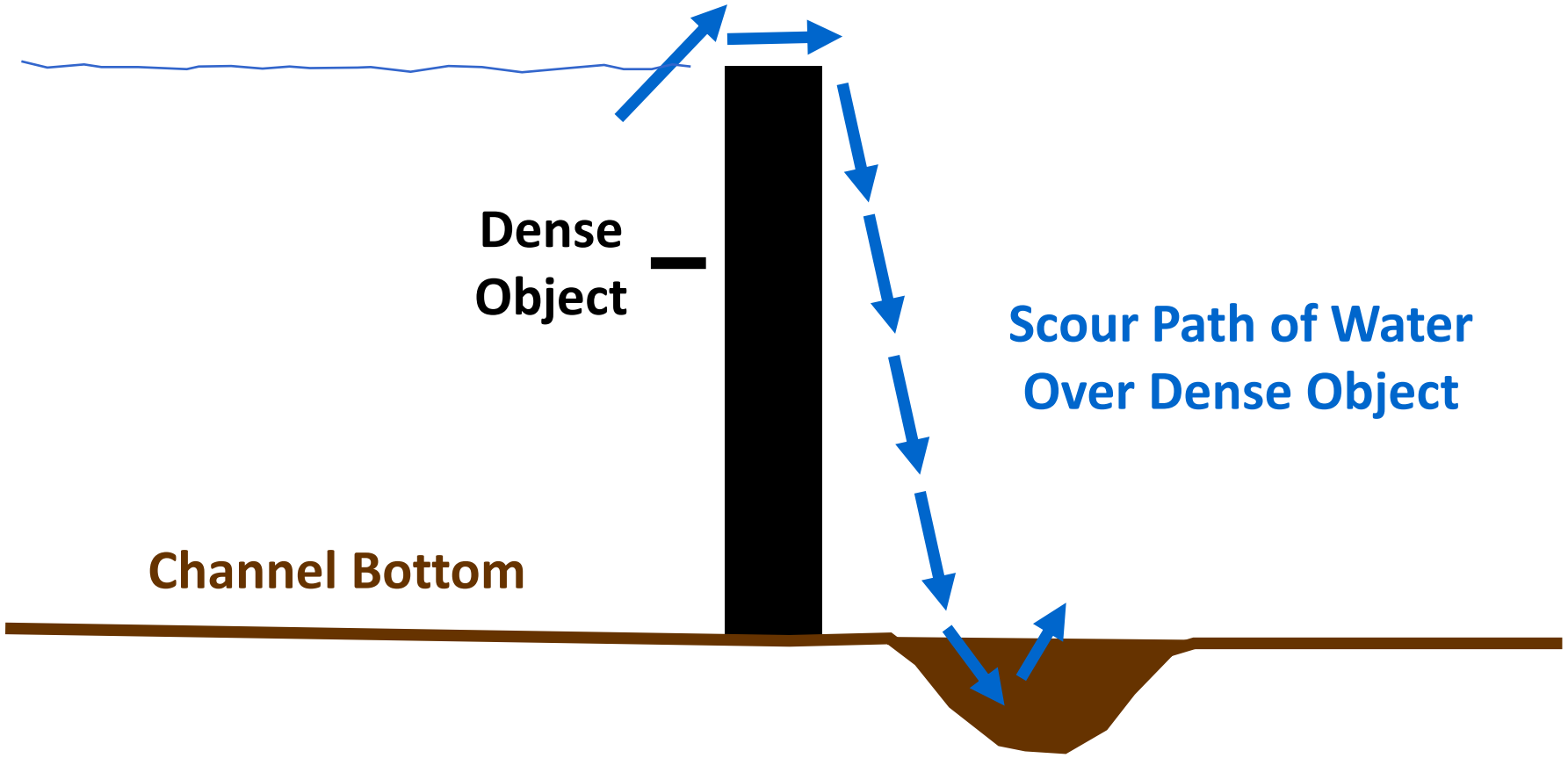
Scour Around

Installation is Always Key



Possible Scour When Flow Overtops an Object

Note: NTS



Scour From Overtopping

Scour hole and NO vegetation downstream of where dense product was installed.

Footprint of where dense product was removed.

Scour From Overtopping

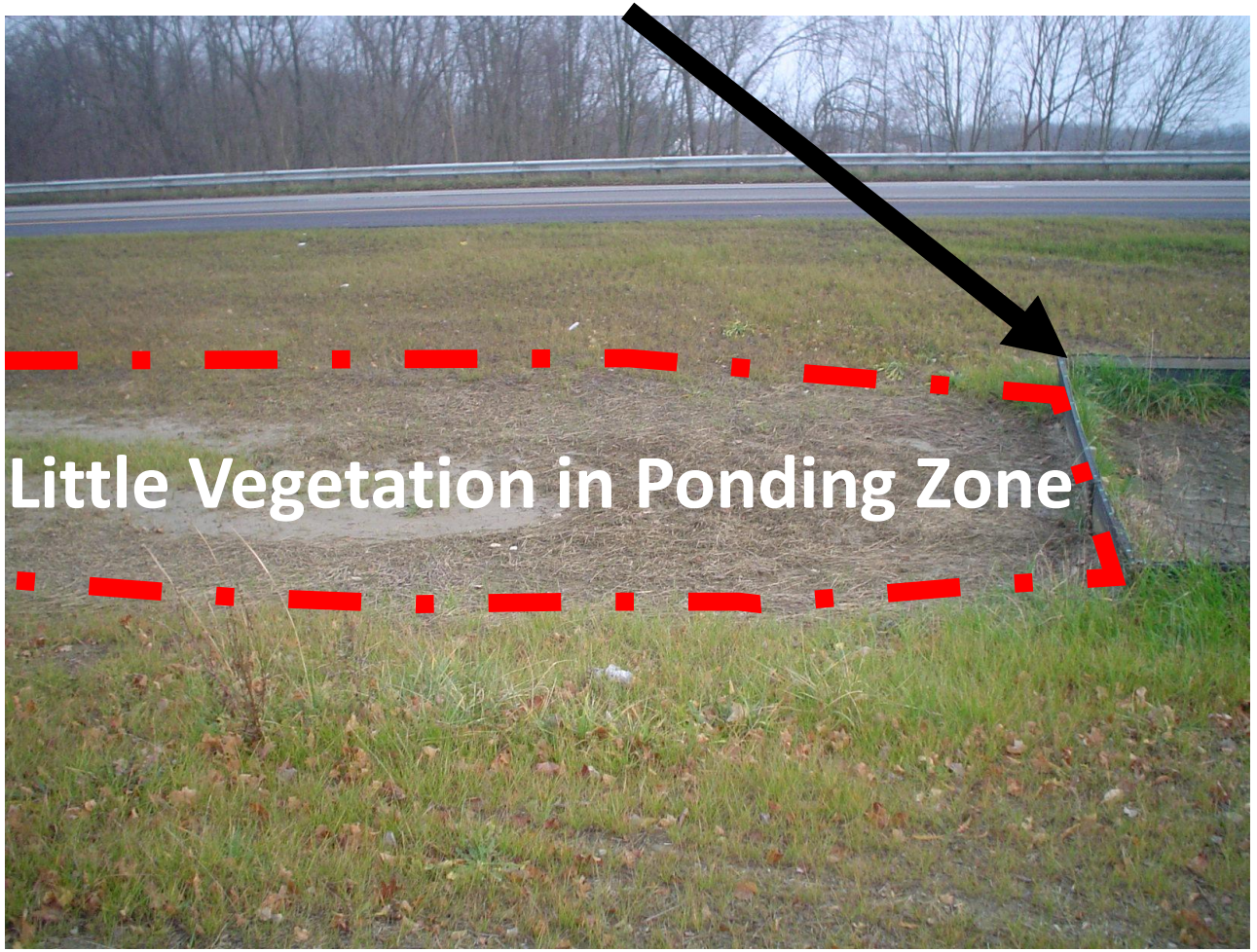
Scour From Overtopping

Damming Products & Vegetation

- Underlayment fabric prevents vegetation establishment.
- Ponded water reduces vegetation establishment.
  - Bare soil in ponded areas introduces weak spot in the channel for erosion to start.

Lack of Vegetation Due to Ponding

Dense Inlet Protection Device



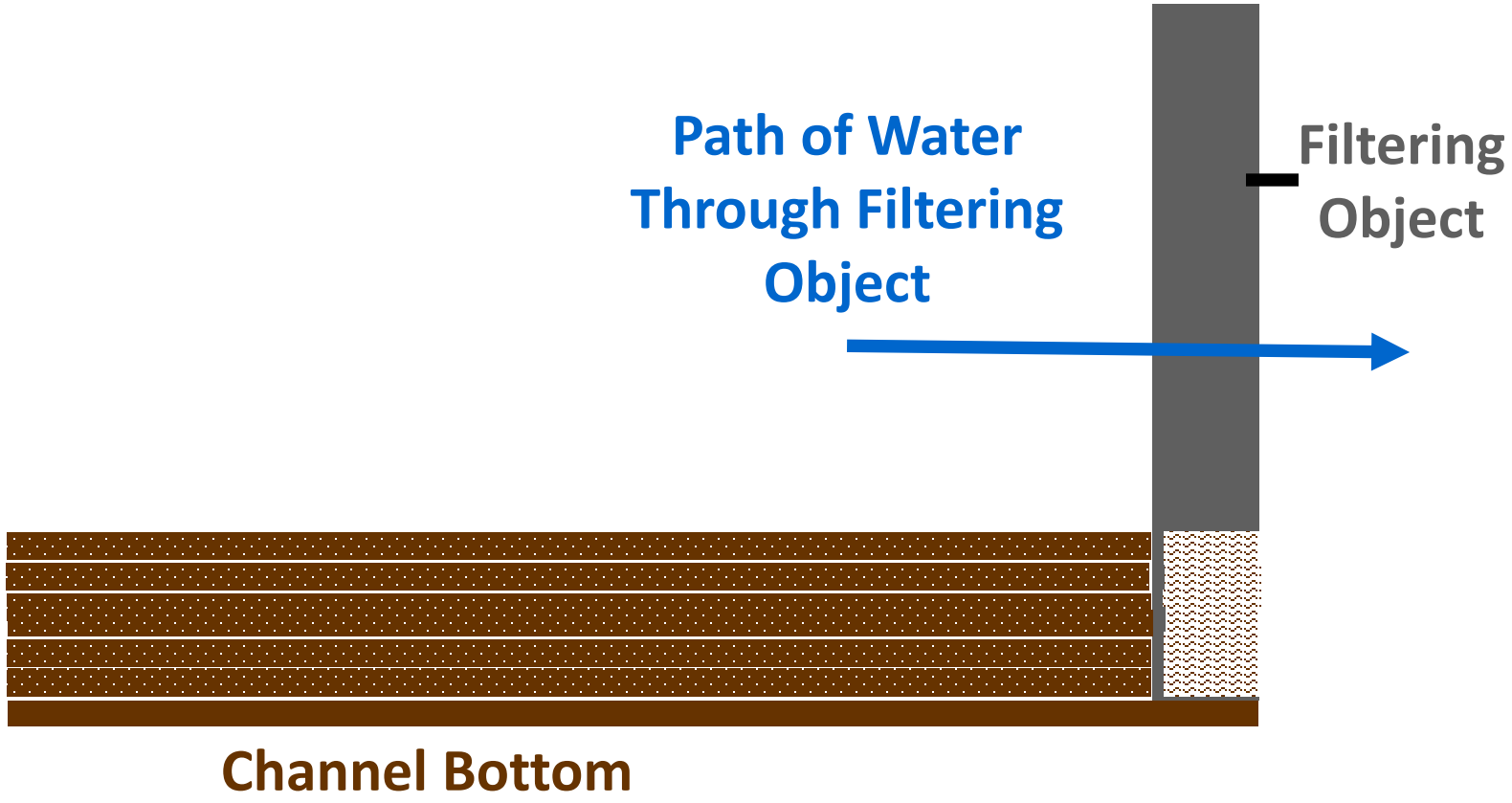
“Blow Outs” Using Damming Devices

Applications for Damming Products

- Temporary sediment control in channels.
  - Remember to include underlayment to prevent scour.
- Sheet flow applications
  - Perimeter control
  - Slope interruption

When Concentrated Runoff Flows Through a Filtering Device

Note: NTS



Filtering Device in the Field

Filtering Device in the Field

Filtering Device in the Field

Filter Device Evaluations

Pre-flow

Post-flow

Filtering Device in the Field

Vegetated Channel Using Filtering Device

Filtering Products

- Flow rate ≥35 GPM/$ft^{2.}$
- Porous design allows for water to flow through fiber matrix.
- Sediment and other contaminants are trapped within matrix.

Aspen Excelsior Fiber
Natural Mechanical Functions

Aspen Excelsior Fibers vs. Straw Fibers Natural Mechanical Functions

Aspen Excelsior Sediment Logs

Aspen Excelsior Sediment Logs

- Velocity dissipation
- Sediment trapped in matrix and deposited up slope of log.

Independent research has quantified aspen excelsior fiber's unique capability to remove polynuclear aromatic hydrocarbons (PAHs), which are typical components of asphalts, fuels, oils, and greases.

- Source: Boving and Zhang, Chemosphere 54 (2004) 831-839

Boving and Zhang's Chemosphere [54 (2004) 831-839] paper quantified their University of Rhode Island results of Curlex fibers' unique capability to reduce polynuclear aromatic hydrocarbons (PAHs) from runoff

Filtered Runoff

Applications for Filtering Products

- Temporary or permanent sediment control channels.
  - Porous matrix usually translates to a flexible device that conforms to subgrade.
- Sheet flow applications.
  - Perimeter control
  - Slope interruption

Summary

- Every BMP has its place when installed properly in the right application.
- Large-scale testing has shown dense damming devices to work well in temporary sediment control applications in conjunction with underlayment fabric. These are applications where vegetation is not desired.
- Damming products have a good history in sheet flow applications such as perimeter control and slope interruption.

Summary (cont.)

- Filtering and Damming devices do not function or perform equally in areas of concentrated flows.
- Hydraulic challenges can be created when damming devices are used without underlayment material in permanent channelized flow areas where vegetation is desired. Filtering devices are designed to dissipate velocity, filter contaminated runoff, and encourage vegetation establishment.

Thank You

Any Questions?

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