Briefing: Soil Erosion and Sediment Control in New Jersey

Executive Summary

New Jersey's approach to soil erosion and sediment control is governed by a comprehensive regulatory framework established in 1976. The cornerstone is the New Jersey Soil Erosion and Sediment Control Act, which mandates that virtually all non-agricultural construction projects disturbing more than 5,000 square feet must implement a certified erosion control plan. This program is administered by the New Jersey Department of Agriculture (NJDA) and local Soil Conservation Districts, which review plans and inspect sites for compliance.

Development of these plans relies on a suite of 32 official design practices, known as "The Standards for Soil Erosion and Sediment Control in New Jersey." These are divided into 10 vegetative standards focused on long-term soil stabilization and 22 engineering standards for temporary controls and permanent stormwater conveyance. A key application of these standards is mitigating environmental damage such as outfall pipe stream scouring, a process where high-velocity stormwater discharge erodes stream beds and banks, leading to sedimentation that degrades water quality and biodiversity. The mitigation of such issues involves a structured four-step process of identification, design, construction, and inspection.

The Regulatory Framework for Stormwater and Erosion Control

New Jersey manages stormwater and soil erosion through three primary sets of regulations administered by two state departments.

The New Jersey Soil Erosion and Sediment Control Act

The primary regulation governing construction-related soil disturbance is the Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq).

- **Mandate:** Since its adoption in 1976, the Act requires the management of soil erosion and stormwater for nearly all non-agricultural construction activities that disturb an area greater than 5,000 square feet.
- **Scope:** The Act applies to a wide range of land disturbance activities, including residential and commercial development, transportation and utility infrastructure, public facilities, and mining.
- **Administration:** The program is implemented by the New Jersey Department of Agriculture (NJDA) in cooperation with the state’s local Soil Conservation Districts.
- **Process:**
    1. Engineers and architects develop "erosion control plans" using a suite of state-approved design practices known as the "Standards."

2. These plans must ensure that erosion is controlled during construction and will not occur after construction is complete.
3. Plans are submitted to the local Soil Conservation District for review and certification.
4. District staff conduct site inspections to verify compliance with the certified plan.

Other Key Stormwater Regulations

In addition to the Soil Erosion and Sediment Control Act, two other key regulations are in place, both administered by the New Jersey Department of Environmental Protection (NJDEP):

- **The New Jersey Pollutant Discharge Elimination System (NJPDES) Stormwater Regulation Program:** (N.J.A.C. 7:14A) This includes requirements for a Stormwater Pollution Prevention Plan (SWPPP).
- **The Stormwater Management Rules:** (N.J.A.C. 7:8)

The Standards for Soil Erosion and Sediment Control

The technical foundation for erosion control plans is "The Standards for Soil Erosion and Sediment Control In New Jersey." The current version is the 7th Edition, published in January 2014 and revised in July 2017 by the New Jersey Department of Agriculture's State Soil Conservation Committee. The document contains a total of 32 distinct practices.

Vegetative Standards (10 Practices)

These standards focus on using vegetation as the primary means to stabilize soil following a disturbance.

- Acid Soils Management
- Dune Stabilization
- Maintaining Vegetation
- Permanent Vegetative Cover for Soil Stabilization
- Stabilization with Mulch Only
- Stabilization with Sod
- Temporary Vegetative cover for Soil Stabilization
- Topsoiling
- Tree Protection During Construction
- Trees, Shrubs and Vines

Engineering Standards (22 Practices)

These standards address temporary control measures used during construction or permanent engineering designs for the safe conveyance of stormwater runoff.

Engineering Standards
Channel Stabilization
Conduit Outlet Protection
Detention Structures
Dewatering
Diversions
Dust Control
Grade Stabilization Structure
Grassed Waterway
Land Grading
Lined Waterway
Off-Site Stability analysis
Riprap Sediment Barrier
Sediment Basin
Slope Protection Structures
Soil Bioengineering
Stabilized Construction Access
Storm Sewer Inlet Protection
Stream Crossing
Subsurface Drainage
Traffic Control
Turbidity Barrier

Application in Construction Projects

The Standards are translated into site-specific plans and measures during construction, as demonstrated by sample plans from a project at Rutgers University.

Erosion Control Plan Components

A typical soil erosion plan legend specifies the various control measures to be used on a site. Common components include:

Plan Legend Item	Description
Limit of Disturbance	Defines the boundary of construction activity.
Proposed Construction Fence	Physical barrier for site security and access control.
Proposed Silt Fence	A temporary sediment barrier of permeable fabric.
Proposed Stockpile	Designated area for temporary storage of soil.
Proposed Gate	A controlled access point in the construction fence.
Proposed Inlet Filter Protection	Measures to prevent sediment from entering storm drains.
Proposed Construction Entrance	A stabilized pad to reduce sediment tracking onto roads.
Proposed Erosion Blanket	A covering used to protect disturbed soil surfaces.
Proposed Tree Protection	Fencing or other measures to protect existing trees.

Standard Control Measure Details

Construction documents provide detailed specifications for implementing these measures, such as:

- **Stabilized Construction Access:** A stone pad at the site entrance to remove mud from vehicle tires.
- **Silt Fence:** A fabric barrier trenched into the ground to intercept and detain sediment-laden runoff. Variations include reinforced and chain-link backed silt fences.
- **Inlet Protection:** Filters placed at curb and on-site storm drain inlets.
- **Temporary Soil Stockpile:** A properly contained mound of soil.
- **Dewatering Controls:** Structures like removable pumping stations to manage groundwater or accumulated rainwater during construction.

Case Study: Addressing Outfall Pipe Stream Scouring

Outfall pipe stream scouring is a significant environmental problem that erosion control standards are designed to mitigate. It is a focus of the New Jersey Tier A Municipal Guidance Document.

The Problem and Its Impact

- **Definition:** "Outfall pipe stream scouring is the localized scouring of the stream bank or bottom caused by the discharge from the outfall pipe."
- **Cause:** Scouring occurs when the velocity of stormwater exiting an outfall pipe is high enough to erode the stream bed and banks.
- **Impact:** This erosion leads to accelerated sedimentation in waterbodies. While sedimentation is natural, excessive amounts result in "a decline in surface water quality and biodiversity."

Mitigation Strategies and Process

Solutions focus on dissipating or reducing the exit velocity of water from outfall pipes. One visual example shows an unstable outfall being corrected with "properly sized rip-rap." Two primary solutions are recommended:

1. **Flow Rate Reduction:** Install or retrofit stormwater management facilities to reduce the flow rate before it reaches the outfall.
2. **Engineering Standards:** Implement approved engineering standards from the State Soil Conservation Committee, such as riprap, lined waterways, or grade stabilization structures, to protect the stream at the point of discharge.

A systematic, four-step process is outlined for implementing these outfall protection projects:

Step	Key Actions
1. Identify	• Identify appropriate sites based on selection criteria. • Coordinate with stakeholders (property owners, residents, communities).
2. Design	• Perform a site survey. • Design a plan to stabilize the outfall. • Obtain all necessary permits. • Inform nearby residents before construction begins.
3. Construct	• Place all erosion and sediment control devices before construction begins. • Modify the outfalls and/or stabilize the channel. • Stabilize the disturbed area with seed or groundcover.
4. Inspect	• Have a third party inspect and approve the outfall protection after construction is complete. • Remove all erosion and sediment control devices. • Return on a regular basis to ensure that the outfall protection functions properly.