Subject:	Effective Date:	Initiated:
Excavation Soil Erosion and Sediment Control	**August 8, 2014**	Head, Facilities and Site Services
	Supersedes:	**Approved:**
	New	Associate Laboratory Director for Engineering & Infrastructure

1.0 Applicability

Excessive soil erosion can negatively impact the Laboratory and surrounding environment, especially the quality of downstream water bodies. The Freehold Soil Conservation District (FSCD) provides guidance and permitting in regard to soil erosion controls and soil conservation under the New Jersey State Standards for Soil Erosion and Sediment Control. PPPL is located in the geographical area for which FSCD has regulatory authority. Therefore, PPPL must comply with applicable state and FSCD requirements. The guidelines and requirements apply to excavation, soil movement and related operational activities that create soil disturbances with the potential for soil erosion and sediment runoff issues.

2.0 Purpose

The guidelines in this document provide information on planning, execution and project completion to minimize or prevent soil erosion for any soil disturbance work at PPPL. They can be applied to projects requiring a FSCD permit and to smaller activities that do not require a permit. The guidelines identify key sections of the New Jersey Standards for Soil Erosion and Sediment Control and outline the major aspects of a Soil Erosion and Sediment Control Plan. The goal is to provide guidance to PPPL employees and subcontractors in proper techniques to mitigate soil erosion or sediment transport.

Lab-wide procedure ESH-014 outlines the requirements for compliance with National Environmental Policy Act (NEPA). All projects involving soil excavation or trenching must have a NEPA review in accordance with ESH-014. Environmental Services procedure EM-OP-42 outlines the requirements to obtain a Soil Erosion and Sediment Control Permit for any project that will disturb more than 5,000 square feet of land. This process requires detailed drawings (sealed by a NJ-licensed Professional Engineer), specifications, an application, and permit fee to FSCD in order to obtain a permit prior to beginning any soil disturbance. Additional details regarding Soil Erosion and Sediment Control Permits are in section 6.0, below. Excavations over 1 acre in size may require a permit for the US Environmental Protection Agency, as discussed in section 7.0, below.

3.0 Engineering Designs and Statements of Work

All applicable Statements of Work for engineering/design services or for construction or excavation work requirements should include either:

A. Appropriate soil erosion and sediment control methods specified by PPPL based on the guidance below (less than 5,000 square feet, see Section 5.0),

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B. Applicable Soil Erosion and Sediment Control Plan requirements (5,000 square feet to 1 acre, see Section 6.0), or

C. Applicable requirements of an EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit (a acre or greater, see Section 7.0).

4.0 Reference Documents

Standards for Soil Erosion and Sediment Control in New Jersey 7/99
ESH-014, National Environmental Policy Act (NEPA) Review System
EM-OP-42, Environmental Permits
Soil Erosion and Sediment Control Act, Chapter 251, Public Law 1975
Soil Survey, Middlesex County, New Jersey, U.S. Dept. of Agriculture, Natural Resources Conservation Service

5.0 Soil Disturbance Less than 5,000 sq. ft.

Minor excavations that are completed in less than one day may require little or no special erosion control measures. Other projects which may not meet the 5,000 square feet threshold should be evaluated for potential soil erosion issues and appropriate control measures should be implemented. For example, excavations that are more than 25-50 square feet in area, are close to drainage features, or will be exposed for more than one day should include suitable erosion control measures. A summary of control measures is given below. Supplementary information can be found in the *New Jersey Standards for Soil Erosion and Sediment Control*.

PPPL maintains a supply of soil erosion and sediment control supplies, such as silt fence, tarps, erosion control blankets, turf mats and inlet protection frames, adjacent to the C-Site roadway near the ESAT Building. Contact Facilities & Site Services or Environmental Services for details.

5.1 Site Disturbance Plan

Planning for larger excavations or disturbed areas that will be open for more than a few days should include a basic site plan that identifies drainage features, erosion control measures, construction sequencing and site access (construction entrance/exit). Temporary and permanent erosion control measures may be included in the plan.

5.2 Dust Control

Like sediment, the movement or blowing of dust can produce off site pollution. Managing dust can be solved by spraying the area with water, covering the dusted areas with mulch, stone, or a manufactured “tacking agent.” It is important that dust is not wetted so much that it will wash into nearby drainage inlets or waterways.

5.3 Stabilized Construction Entrance/Exit

Construction site entrances can be a major source of soil erosion sediment pollution as machinery and vehicles moving on and off the site track mud and dirt that end up in storm sewers, drains, or waterways. Clean crushed stone can be placed where trucks and machinery enter or exit the construction area.

A. The construction entrance should be at least 10 feet wide and 25 to 50 feet long, if feasible.

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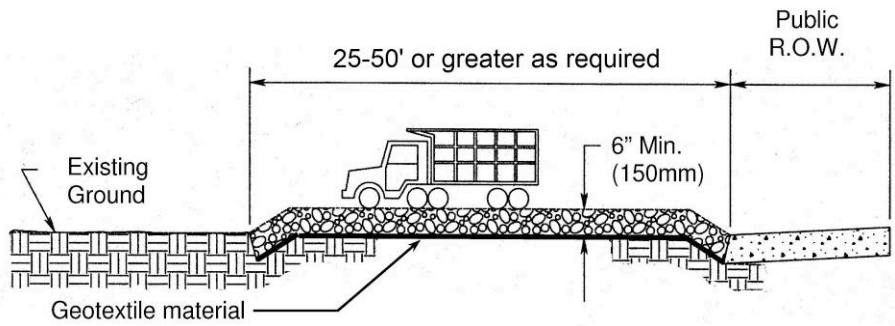
B. A crushed stone wheel cleaning tracking-pad with #2 crushed stone should be installed for the entrance. It should be raked, stamped, and at least 6 inches thick. Filter fabric should be used beneath the rock to keep it from sinking into the soil.

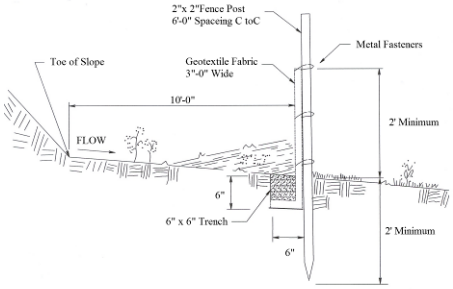


5.4 Upland Runoff Diversion

The movement of water from area up-slope of the excavation (upland runoff) can be a significant cause of sediment pollution and may increase water in the excavation itself. Controlling the velocity of upland runoff and creating a barrier between the site and the upland location can help stabilize the soil and minimize water in the excavation. Vegetation (grasses) and engineering measures (berms or swales) may be to limit the amount of erosion and sediment movement from upland locations. A berm or swale should be constructed so as to minimize erosion and sediment transport in the diversion structure.

5.5 Silt Fences and Sediment Barriers

Installing porous barriers to collect silt can dramatically reduce sediment pollution on the opposite sides of the barrier. Applications vary depending on location of the barrier. Barriers suitable for the bottom of a slope may not be appropriate in a drainage swale. Silt fences are commonly used as they are cost effective and readily available. They typically will be used as the primary silt collection tool and may be augmented with other sediment barriers. Straw bales alone are not an acceptable sediment barrier. *All sediment barriers must be inspected and maintained during construction and restoration.*



5.6 Temporary Seeding, Mulching, Erosion Control Blankets, Sod, and Matting

Where an area may be disturbed for an extended period, temporary erosion control measures should be implemented. Temporary seeding, mulching, erosion control blankets, reinforced turf mats, and sod can be used alone or on combination as temporary erosion controls. Erosion control blankets and reinforced turf mats will typically be used as temporary cover until seed can propagate, they can also be used as temporary erosion control before, after, or between

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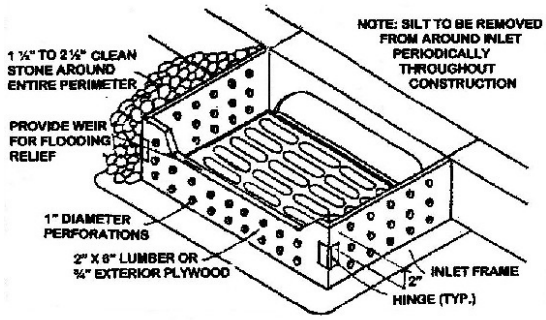
excavations. Sod filters sediment while preventing erosion, but usually it is an alternative to seed and mulch.

5.7 Protection of Drains, Culverts, and Swales

Culverts, drains, and swales are all designed to gather large amounts of rain water and transfer it to other waterways off-site. As a result, they can transport significant quantities of sediment. The protection of storm drain inlets, culverts and swales in or near the work area should be identified prior to the start of excavation. Inlet protection measures should capture the majority of sediment while allowing water to flow in order to minimize flooding. Silt fence and stone filter berms are common methods to protect storm drain inlets.



5.8 Soil Stockpiles

Soil stockpiles can be a major source of erosion and can threaten the integrity of the excavation if not properly managed. Soil stockpiles that will be left exposed for more than 30 days must be seeded with fast-growing temporary seeding and mulch. If the weather does not permit seeding straw, mulch, silt fence or another measure to contain the soil must be taken. Soil stockpiles exposed for less than 30 day, at a minimum, must be covered with tarps or matting when not being used.

5.9 Final Soil Conditioning, Seeding, and Mulching

Final site restoration should include grading, soil conditioning, seeding and mulching or other appropriate measures to prevent soil erosion during site restoration. Conditioning soil creates a constructive environment for seed or plantings to flourish. Mulching retains soil moisture and enables new seed to sprout and grow. The site may need temporary irrigation until new grass is established.

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5.10 Maintaining and Closing Out Project

All erosion and sediment controls must be inspected for failures and repaired as needed. Erosion control structures (silt fencing, inlet protection, construction entrances, etc.) should be inspected regularly and checked for sediment buildup. Upon closing out the project, controls that were established as temporary solutions must be removed and replaced with permanent stabilization which is maintained until site restoration is complete.

6.0 Soil Disturbance More than 5,000 Square Feet but less than 1 Acre

A Soil Erosion and Sediment Control Permit from the Freehold Soil Conservation District (FSCD) is required for any project area with a soil disturbance of 5,000 square feet or more. The Soil Erosion and Sediment Control Permit must be issued before any ground-disturbing work can proceed. Procedure EM-OP-42 outlines the process for obtaining a Soil Erosion and Sediment Control Permit. The Cog or RLM should consult with the Environmental Compliance Manager early in the design/construction process to ensure that sufficient time is allowed for the permitting process. The following actions must be taken before construction can begin.

6.1 Obtain Soil Erosion and Sediment Control Permit and Plan Certification

A. Soil Erosion and Sediment Control Plan

A Soil Erosion and Sediment Control Plan is required for a FSCD permit. The Plan must be signed/sealed by a NJ-licensed Professional Engineer. The Plan shows the project area and the applicable areas for sediment control. The Plan is reviewed and amended by the soil district. The soil erosion and sediment control plan must delineate all applicable applications which include: (refer to *New Jersey Standards for Soil Erosion and Sediment Control*)

i. Site plan with North arrow
ii. Site disturbance area
iii. New Jersey Project Engineer approval (seal/signature)
iv. Dust control measures
v. Stabilize entrances and exits
vi. Upland runoff diversion
vii. Traffic control
viii. Final seeding and mulching
ix. Sediment barriers
x. Temporary seeding and mulching
xi. Grading
xii. Drain, inlets, and waterway protection
xiii. Soil stockpiles
xiv. Maintenance and closing out project

B. Permit Application & Documentation

As outlined in EM-OP-42, ESD will coordinate the preparation and submittal of the certificate application, Plan, and other documentation. ESD will advise the COG/RLM of comments and/or approval from FSCD.

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C. Payment
ESD coordinates the payment of application and permit fees. The Review Fee and Compliance Fee combined can range from as little as $985 to as much as $2885, depending on the project size.

6.2 48-Hour and 72-Hour Notice
A 72 hour FAX notice is to be completed before the first land disturbance. The notice is included in the application packet. ESD will work with the COG/RLM to complete this notice and submit it to FSCD before any ground disturbance.

6.3 Pre-Construction Meeting
If required, a pre-construction may be scheduled with the FSCD to review requirements particular to the certified plan. A copy of the certified plan must be on site at all times.

6.4 Plan Changes
Any site changes to the grading, landscape management plan, and/or the storm water management plan must be reported to the FSCD. Modifications may require the plan to go through a re-certification process.

7.0 Soil Disturbance of 1 Acre or Greater

If disturbance is greater than 1 acre in size an EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit may be required. Consult with the Environmental Services Division (ESD) for additional information on planned site disturbances that total over 1 acre in size. Consult with ESD early in the design/construction process to ensure that sufficient time is allowed for the permitting process.

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