Table 1.1. Soil textural classes and general terminology used in soil descriptions (Source: US Environmental Protection Agency 1977).

Name	Texture	Basic soil textural common class names
Sandy soils	Coarse	Sand Loamy sand
	Moderately coarse	Sandy loam Fine sandy loam
	Medium	Very fine sandy loam Loam Silt loam Silt
	Moderately fine	Clay loam Sandy clay loam Silty clay loam
Clay soils	Fine	Sandy clay Silty clay Clay

1.2 REGULATORY REQUIREMENTS

Erosion and sediment control requirements exist at the federal, state, and local levels of government. Some local governments (city and county) have adopted site development or sediment control ordinances or regulations, and it is recommended that contractors or developers check with local units of government to determine whether local ordinances may affect their proposed activities.

Federal and State Erosion and Sediment Control Requirements

The U.S. Environmental Protection Agency (EPA) issued final regulations on December 8, 1999, identifying which activities or facilities are now required to have storm water permits. Authority to issue the federal NPDES permits within the state of Iowa has been granted to the Iowa Department of Natural Resources (DNR). Thus, compliance with the federal NPDES storm water permit requirements can be achieved by obtaining a permit from the Iowa DNR. The following three topics are discussed in this section:

1. Identify construction projects that need a permit for their storm water discharge
2. Obtaining a permit for storm water discharge for a construction project
3. Determining the erosion and sediment control requirements needed in the NPDES storm water discharge permit

Construction Projects that Need a Permit for Storm Water Discharge

Effective March 10, 2003, any land-disturbing activity that will “disturb” an area of one or more acres is required to have an NPDES permit for its storm water discharge.

The one-acre limit is based on the “common plan of development.” This common plan of development means that multiple, separate, or distinct construction activities may be taking place

at different times on different schedules under one plan. Thus, breaking down a large project into numerous projects of less than one acre does not relinquish the need for a storm water discharge permit. If the overall common plan of development will involve the disturbance of one or more acres, construction on any portion of the project needs to be covered by a storm water discharge permit.

Meaning of the Term "Land-Disturbing Activity"

A land-disturbing activity includes actions that alter the surface of the land. Such activities include, but are not limited to, such actions as clearing, grading, and excavation. Other examples include final grading, building or maintaining construction access roads, filling, and on-site borrowing. All of these areas should be included when estimating the area undergoing any land-disturbing activity.

Meaning of the Term "Storm Water Discharge"

The NPDES permit is required for storm water discharge from any disturbed areas. The term "storm water discharge" refers to any surface runoff from the disturbed areas of the construction site. Construction site storm water runoff results from rainfall runoff or snow melt. The need for a permit applies regardless of the location of the land-disturbing activity.

Obtaining a Permit for Storm Water Discharge for a Construction Project

Storm water discharges from construction activities are eligible (depending on project size) for permit coverage under the Iowa DNR's General Permit No. 2. General Permit No. 2 is an NPDES permit that applies only to storm water discharge from land-disturbing (construction) activity. The general permit specifies up front all of the terms and conditions required and expected to be met. Linking a specific construction project at a particular site to the general permit is done by filing a notice of intent with the DNR. In this way, the owner or general contractor is officially notifying the DNR of the intent to meet the terms and conditions of the general permit. The instructions for filing a notice of intent to be covered under General Permit No. 2, the permit itself, and all other associated forms can be obtained from the DNR website: http://www.iowadnr.com/water/stormwater/index.html.

Erosion and Sediment Control Requirements in the NPDES Storm Water Discharge Permit

Every project must have a pollution prevention plan developed before the notice of intent is submitted to the DNR. The planning and implementation of erosion and sediment control is a crucial component to the pollution prevention plan. Table 1.2 highlights the requirements of Iowa's General Permit No. 2 that relate to erosion and sediment control.

Table 1.2. Requirements in General Permit No. 2 related to erosion and sediment control

Pollution prevention plan	Every project must have a pollution prevention plan developed before the notice of intent is submitted to the DNR. The pollution prevention plan should be kept at the construction site and should be kept up to date. **All contractors and subcontractors involved in land-disturbing activities must sign the pollution prevention plan and become co-permittees of the NPDES permit**. The plan needs to include the following: the sequence of major construction activities and an explanation of how the erosion practices will be phased in with the construction activities; an identification of the selected erosion and sediment controls at the site; each contractor's/subcontractor's role and responsibility in the project and towards erosion and sediment controls; the party(s) responsible for inspection, maintaining, and evaluating the appropriateness of the selected erosion and sediment control practices; and required records of the inspection and maintenance of the sediment and erosion controls.
Run-on controls	To the degree attainable, run-on from undisturbed areas should be diverted from the disturbed areas of the construction site to minimize the amount of area drained for which controls must be provided.
Stabilization practices	During construction, if a disturbed area is to be left idle for more than 21 days, temporary erosion control practices need to be initiated by the 14th day. Temporary erosion control measures include temporary seeding, mulching, geotextiles, etc. These types of practices are aimed at keeping the soil in its original place, rather than capturing it after erosion has occurred.
Structural sediment control	If the area drained is 10 or more acres and there is a common drainageway, a sediment basin with a holding capacity of 3,600 cu ft per acre drained (including off-site area drainage) is to be provided. If a sediment basin is not feasible, comparable erosion control measures on the downslope and sideslopes of the project perimeter are to be provided. For drainage locations serving 10 or fewer acres, structural controls are required for all sideslope and downslope boundaries of the construction area or a sediment basin providing storage for 3,600 cu ft of storage per acre drained must be provided.
Storm water management	The storm water management plan must identify the selected measures that will be installed during construction to control pollutants in storm water discharges that will occur after construction has been completed. After the project is completed and final stabilization is reached, the site's capacity for erosion must be determined? A goal of 80% removal of sediment should be used in designing and installing storm water management practices. Permanent controls may be needed to control erosion from the site. Increased runoff from the site may cause increased erosion downstream. Velocity dissipation devices shall be placed at the discharge location and along the length on any outfall grass channel as necessary to provide a non-erosive flow from the structure to a receiving watercourse.
Inspection and maintenance	Once a week and within 24 hr after a 0.5 in. rainfall, erosion and sediment control practices must be inspected. The practices should be properly maintained and records should be kept. If an existing practice is not working or fails frequently, continued use of that practice should be reevaluated.
Recordkeeping	Records of land-disturbing activities should be kept to determine which areas need to be stabilized. Records on the maintenance and inspection of erosion and sediment control practices must be kept.

State Erosion and Sediment Control Requirements

Iowa law (Code Section 161A.64) requires that before beginning certain land-disturbing activities, the person conducting the activities must file a signed affidavit with the SWCD stating that erosion caused by the activities will not exceed the district's adopted soil loss limits. For most soils, the limit is an annual soil loss of five tons per acre. Forms for filing the affidavit may be obtained from county SWCD offices.

The requirements for filing the affidavit change if a land-disturbing activity is being carried out within the boundaries of a city or county that has adopted a sediment control ordinance are at least as restrictive as the SWCD's soil loss limits. The SWCD retains primary responsibility for the program, but may share authority through a written agreement with the governmental unit. The affidavit must be filed with that governmental unit rather than the SWCD. The SWCD should be contacted to determine whether any local governmental units in the county have adopted sediment control ordinances and have been delegated authority to receive the affidavits.

Land-disturbing activities covered in Code Section 161A.64 include tilling, clearing, grading, excavating, transporting, or filling land that may result in soil erosion from wind and water and the movement of sediment and sediment-related pollutants off-site. However, the following activities are excluded:

- Tilling, planting, or harvesting of agricultural, horticultural, or forest crops
- Preparation for single-family residences separately built unless in conjunction with multiple construction projects in a subdivision development
- Minor activities such as home gardening, landscaping, repairs, and maintenance work
- Surface or deep mining
- Installation of public utility lines and connections, fence posts, sign posts, telephone poles, electric poles, and other kinds of posts or poles
- Installing septic tanks and drainage fields, unless these are to serve a building whose construction is a land-disturbing activity
- Construction and repair of tracks, right-of-way, bridges, communication facilities, and other related structures of a railroad
- Emergency work to protect life or property
- Disturbed land areas of less than 25,000 square feet, unless a political subdivision by ordinance established a smaller exception or established conditions for this exemption
- The construction, relocation, alteration, or maintenance of public roads by a public body

Sediment Damage Complaint Procedure

Iowa law (Code Section 161A.47) allows the owner or operator of land being damaged by sediment runoff from eroding land to file a written and signed complaint with the SWCD. Upon its receipt, the SWCD commissioners inspect the complainant's property to determine whether sediment damage is occurring and inspect the land alleged to be causing the damage to determine whether erosion is causing soil loss in excess of the district's adopted limits. If the investigation finds that sediment damage is occurring as a result of erosion in excess of the limits, the commissioners will take action to have the erosion problem corrected.

A recent change in state law also allows district commissioners to file complaints if they believe excessive erosion is causing sediment damage to public property or to private property where public improvements have been made.

1.3 SOIL EROSION AND SEDIMENT CONTROL MEASURES MATRIX

An erosion control measures matrix has been developed that parallels the three categories of erosion control measures: vegetative and soil stabilization, structural, and special condition erosion control measures. This matrix will enable the designer or planner to quickly review the various options available and the situations in which the options will perform satisfactorily on the basis of various conditions of the proposed construction site.

The matrix takes into account various conditions, including soil erodibility, degree of slope, climate, topography, and season of the year. These conditions have particular criteria:

- **Perimeter Control**. Planned measures installed around the perimeter of the construction site to prevent surface water from damaging the area during or after construction
- **Slope Protection.** Planned measures installed on or above an erosion slope to prevent soil erosion and sedimentation
- **Borrow and Stockpiles.** An area of the construction site where earth is borrowed (excavated to use as fill at another location) or stockpiled (topsoil is temporarily stored) to be respread following construction
- **Drainage Areas.** The area of land above the development site (including the construction site) that naturally contributes water runoff to the area under construction
- **Sediment Trapping.** Planned measures installed below a potentially erosive area, designed to catch eroded soil temporarily until the area above can be stabilized and/or damage to the area below can be prevented
- **Streams.** A water course flowing naturally through a construction site
- **Temporary Stabilizing.** Planned measures installed to provide temporary cover to an erosive area on a construction site while permanent stabilization of the area is being established
- **Permanent Stabilizing**. Planned vegetation or structural measures installed to permanently prevent a constructed area or finished site from eroding
- **Soil.** The makeup of the top surface of a construction site (texture of soil: sand, silt, or clay) must be taken into account in planning and designing measures to control erosion during and after construction. See your County Soil Survey for details
- **Slope.** The inclination of the land surface from the horizontal, with the steeper and longer slopes having the most erosion potential
- **Effectiveness.** The value of each measure to control erosion over a specified period of time

In the following tables (Tables 1.3 through 1.5), each practice has been analyzed according to the criteria and an X has been marked in each section that pertains to the practice. Information pertaining to a given practice is found on the front and back of each page.