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The Urban Environment And NPS Pollution

Best Management Practices For Construction Activities

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More than one million acres of land are disturbed by construction each year in the United States. Runoff from the construction of homes, factories, shopping centers, and highways can carry large quantities of pollutants to surface waters. While sediment is the most common pollutant, other substances such as chemicals, pesticides, paints, plant debris, and fertilizers can also be washed from construction sites.

Causes of construction site erosion are relatively simple to understand and almost as simple to remedy. When protective vegetation is removed and earth-moving machinery begins to reshape the site, the soil is laid open to the erosive forces of water and wind. The extent and intensity of land disturbance, the length of time before construction activities are completed and surfaces are restabilized, the amount of traffic on the site during construction, and the severity of storms during this period all greatly affect the amount of erosion that occurs.

Erosion under these circumstances can be hundreds or thousands of times higher than that from comparable undeveloped sites. Although the actual construction period may be relatively short, the impact on water quality can be severe and long lasting. Over a short period of time, construction sites can contribute more sediment to streams than was previously deposited over several decades.

Educate Those Involved

The first step in reducing erosion problems is to inform municipal officials, developers, builders, and home buyers of the potential damages resulting from soil erosion on lands undergoing development. Understanding the problem may result in voluntary cooperation in erosion control programs or in policies and ordinances designed to insure the use of erosion control practices.

Builders and developers can minimize erosion and sedimentation by fitting the development into the natural landscape. Knowing the soil, topography, and drainage patterns for a site will help determine its suitability for development. Areas with severe slopes and highly erodible soils should be protected from construction activities. Such areas require expensive controls and are best suited for open space or recreational uses.

Develop A Plan

An erosion control program, worked out before construction begins, can avoid or lessen most erosion and sedimentation problems. Plans should include ways to protect erodible areas, a schedule of activities to minimize soil exposure, and provisions to trap sediment before it leaves the site.

Use Erosion And Sediment Control Practices

Several basic measures may be used to control erosion during construction.

• **Schedule construction activities to minimize land disturbance during peak runoff periods.** By completing soil conservation practices in the fall or late winter, for example, erosion can be reduced during spring runoff.

• **Minimize exposed area** by grading only one part of a construction site at a time. The site can be divided into subareas or subwatersheds. If possible, grading on a new subarea can be delayed until protective cover is restored on the previously graded area. Also, utility installations can be coordinated to limit the number of excavations. All of this requires careful planning to minimize costly delays.

• **Protect disturbed soil** from rainfall by preserving as much natural cover, topography, and drainage as possible during construction. Trees or shrubs should not be removed unnecessarily since they, too, can help decrease erosion.

• **Stabilize disturbed areas** as promptly as possible, especially on long or steep slopes. Use recommended plant materials and mulches to establish protective ground cover. Vegetation, such as fast growing annual and perennial grasses, shields and binds the soil. Mulches and artificial binders must be used until vegetative cover has been established. Where truck traffic is

frequent, gravel approaches can reduce soil compaction and limit the tracking of sediment into streets.

• **Control surface runoff** to reduce erosion by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures—such as terraces, dikes, and ditches—collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, checkdams, hay bales, and similar devices reduce runoff velocity and its ability to erode.

• **Contain the sediment** when conditions are too extreme for treatment only by surface protection. Various practices may be used to contain or trap pollutants. Temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins detain runoff water long enough for the sediment particles to settle out. Sediment catch basins may also be used when other control schemes are too expensive or impractical. For many construction projects these basins should be permanent.

The effectiveness of any control technique also depends on the type of construction activity. Very steep slopes, for instance, such as those resulting from road construction, require special sediment control. Other construction activities, such as extensive stockpiling of topsoil on large construction sites, may also require special management practices. Topsoil is essential in establishing new vegetation and stockpiled topsoil should be protected from rainfall and runoff.

Despite the most effective best management practices (BMPs), some erosion will occur on construction sites. More information is presented on erosion and sedimentation in another article in the water quality series. Detailed information on erosion and sediment control is presented in the *Alabama Handbook For Erosion Control, Sediment Control, And Stormwater Management On Construction Sites And Urban Areas* (Alabama Soil And Water Conservation Committee, 1992).

Use Chemical Control Practices

Other pollutants from construction sites can also contaminate runoff water. Certain chemicals, pesticides, and fertilizers should be prevented from entering water. Good housekeeping practices such as handling, storing, and disposing of materials properly can prevent chemical pollution from construction sites.

• Develop a plan to prevent, control, and cleanup any spills of fuel, oils, or hazardous materials.

• Develop a nutrient management plan to prevent excess runoff losses and contamination of drainage courses.

• Store, handle, use, and dispose of petroleum products properly.

• Store, cover, and isolate construction materials including topsoil and chemicals to prevent runoff losses and contamination of groundwater.

• Establish fuel and vehicle maintenance areas away from all drainage courses and design these areas to control runoff.

• Maintain and wash equipment and machinery in confined areas specifically designed to control runoff.

• Provide sanitary facilities for construction workers.

• Provide disposal facilities for soil wastes including excess asphalt produced during construction.

• Educate all workers in the proper handling, use, cleanup, and disposal of all chemical materials used during construction activities.

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