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40 CFR Parts 122 and 450
Effluent Limitation Guidelines and New Source Performance Standards for the Construction and Development Category; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 122 and 450

[FRL–7217–1]

RIN 2040–AD42

Effluent Limitation Guidelines and New Source Performance Standards for the Construction and Development Category; Proposed Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing a range of options to address storm water discharges from construction sites. As one option, EPA is proposing technology-based effluent limitation guidelines and standards (ELGs) for storm water discharges from construction sites required to obtain National Pollutant Discharge Elimination System (NPDES) permits. As another option, EPA is proposing not to establish ELGs for storm water discharges from those sites, but to allow technology-based permit requirements to continue to be established based upon the best professional judgment of the permit authority A third option would establish inspection and certification requirements that would be incorporated into the storm water permits issued by EPA and States, with other permit requirements based on the best professional judgment of the permit authority. This proposal, if implemented, is expected to significantly reduce the amount of sediment discharged from construction sites. The deposition of sediment from construction site runoff has contributed to the loss of capacity in small streams, lakes, and reservoirs, leading to the necessity for mitigation efforts such as dredging or replacement. Today's document also requests comment and information on several variations on these options and several other significant aspects of the proposal, such as technologies, costs, and economics.

DATES: EPA must receive comments on the proposal by October 22, 2002. EPA will conduct public meetings for this proposed rule on July 9, 2002; July 23, 2002; July 30, 2002 and additional dates to be announced later.

ADDRESSES: Submit written comments to: Comment Clerk, Water Docket (4101), US EPA, 1200 Pennsylvania Ave., NW., Washington, DC 20460. (See next paragraph regarding addresses for hand deliveries.) Please refer to Docket No. W–02–06. EPA requests an original and three copies of your comments and enclosures (including references). Commenters who want EPA to acknowledge receipt of their comments should enclose a self-addressed, stamped envelope. No facsimiles (faxes) will be accepted. Comments may also be sent via e-mail to *ow-docket@epa.gov*. For additional information on how to submit electronic comments see "**SUPPLEMENTARY INFORMATION,** How to Submit Comments."

EPA will be holding public meetings on today's proposal on five separate dates. The first three meetings are listed below; EPA will announce the remaining meetings in a subsequent **Federal Register** document and on its website at http://www.epa.gov/waterscience/guide/construction/. No registration is required for these meetings. Seating will be provided on a first-come, first-served basis.

- Tuesday, July 9, 2002, 9 a.m.–noon, Hyatt Regency Hotel—San Francisco Airport, 1333 Bayshore Highway, Burlingame, CA, Phone 650–347–1234.
- Tuesday, July 23, 2002, 9 a.m.–noon, Wyndham Garden Hotel—Dallas Park Central, 8051 LBJ Freeway (I–635), Dallas, TX, Phone 972–680–3000.
- Tuesday, July 30, 2002, 9 a.m.–noon, Holiday Inn Chicago—Elmhurst, 624 N. York Rd., Elmhurst, IL, Phone 630–279–1100.

Meeting Access: If you need special accommodations at this meeting, including wheelchair access, you should contact the Eastern Research Group Conference Registration Line at 781–674–7374, at least five business days before the meeting so that appropriate arrangements can be made. See "Public Meeting Information" below for additional meeting details.

EPA established the public record for this proposed rulemaking under docket number W–02–06. The record is currently located in the Water Docket, Room EB 57, Waterside Mall, 401 M Street, SW., Washington, DC. The record is available for inspection from 9 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. For access to the docket materials, call 202–260–3027 to schedule an appointment. You may have to pay a reasonable fee for copying. Please note that several of the support documents are available at no charge on EPA's website; see "Supporting Documentation" below. The Water Docket will be moving to a new office location in August 2002. For hand deliveries of comments through August, submit to the above address. Please call the above number for details on the new location.

FOR FURTHER INFORMATION CONTACT: For technical information concerning today's proposed rule, contact Mr. Jesse Pritts at 202–566–1038 or Mr. Eric Strassler at 202–566–1026. For economic information contact Mr. George Denning at 202–566–1067.

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action include:

Category	Examples of regulated entities	North American Industry Classification System (NAICS) code
Industry ..	Construction site operators disturbing 1 or more acres of land and performing the following activities:	
	Building, Developing and General Contracting.	233
	Heavy Construction	234

EPA does not intend the preceding table to be exhaustive, but provides it as a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria in § 450.10 of today's proposed rule and the definition of "construction activity" and "small construction activity" in existing EPA regulations at 40 CFR 122.26(b)(14)(x) and 122.26(b)(15), respectively. If you have questions regarding the applicability of this action to a particular entity, consult one of the persons listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

How To Submit Comments

The public may submit comments in written or electronic form. (See the **ADDRESSES** section above.) Electronic comments must be identified by the docket number W–02–06 and must be submitted as a WordPerfect, MS Word or ASCII text file, avoiding the use of special characters and any form of encryption. EPA requests that any graphics included in electronic comments also be provided in hard-copy form. EPA also will accept comments and data on disks in the aforementioned file formats. Electronic comments received on this notice may be filed online at many Federal

Depository Libraries. No confidential business information (CBI) should be sent by e-mail.

Public Meeting Information

See the **ADDRESSES** section of this document for dates and locations of public meetings. During the meetings, EPA will present information on the applicability of the proposed regulation, the technology options selected as the basis for the proposed limitations and standards, and the compliance costs and pollutant reductions. EPA will also allow time for questions and answers during these sessions. These meetings are not public hearings for the purpose of obtaining comment on the proposal. EPA will not generate a transcript of the meetings. The public may submit comments in writing or electronically as described above.

Supporting Documentation

Several key documents support the proposed regulations:

1. "Development Document for Proposed Effluent Guidelines and Standards for the Construction and Development Category," EPA–821–R–02–007. ("Development Document") This document presents EPA's methodology and technical conclusions concerning the C&D category.

2. "Economic Analysis of Proposed Effluent Guidelines and Standards for the Construction and Development Category," EPA–EPA–821–R–02–008. ("Economic Analysis") This document presents the methodology employed to assess economic and environmental impacts of the proposed rule and the results of the analysis.

3. "Environmental Assessment for Proposed Effluent Guidelines and Standards for the Construction and Development Category," EPA–EPA–821–R–02–009. ("Environmental Assessment")

Major supporting documents are available in hard copy from the National Service Center for Environmental Publications (NSCEP), U.S. EPA/NSCEP, P.O. Box 42419, Cincinnati, Ohio, USA 45242–2419, telephone 800–490–9198, *http://www.epa.gov/ncepihom/*. You can obtain electronic copies of this preamble and proposed rule as well as the technical and economic support documents for today's proposal at EPA's website for the C&D rule, *http://www.epa.gov/waterscience/guide/construction*.

Overview

The preamble describes the terms, acronyms, and abbreviations used in this notice; the background documents that support these proposed regulations; the legal authority of these rules; a summary of the proposal; background information; and the technical and economic methodologies used by the Agency to develop these regulations. This preamble also solicits comment and data on specific areas of interest.

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I. Legal Authority

EPA is proposing this regulation under the authorities of sections 301, 304, 306, 308, 402 and 501 of the Clean Water Act (CWA), 33 U.S.C. 1311, 1314, 1316, 1318, 1342 and 1361 and pursuant to the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*

II. Purpose and Summary of Proposed Rule

Construction and development (C&D) activity affecting water quality typically involves site selection and planning, and land-disturbing tasks during construction such as clearing, excavating and grading. Disturbed soil, if not managed properly, can be easily washed off-site during storm events. Storm water discharges generated during construction activities can cause an array of physical, chemical and biological impacts. Water quality impairment may result, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing pollutants from construction sites into aquatic systems.

A primary concern at most construction sites is the erosion and transport process related to fine sediment because rain splash, rills (small channels typically less than one foot deep) and sheetwash (thin sheets of water flowing across a surface) encourage the detachment and transport of this material to water bodies. Although streams and rivers naturally carry sediment loads, erosion from construction sites and runoff from developed areas can elevate these loads to levels above those in undisturbed watersheds.

Existing national storm water regulations require construction site operators to implement controls to manage construction site runoff, but do not require any specific level of control. One of today's proposed approaches (Option 2) would establish effluent limitation guidelines in the form of minimum standards for design and implementation of erosion and sediment controls used during the active phase of construction. This approach would cover sites with five or more acres of disturbed land, and would establish minimum requirements for conducting site inspections and providing certification as to the design and completion of various aspects of those controls.

EPA acknowledges that many State and local governments have existing standards for temporary controls. Today's proposed effluent guidelines are intended to work in concert with existing requirements where equivalent, and would not supercede more stringent requirements.

In addition, EPA is proposing two alternatives that would not set national standards for control of storm water discharges from construction sites subject to permit requirements under section 402 of the CWA. Both of these approaches would rely instead on a combination of existing State and local requirements and additional requirements based on the best professional judgement (BPJ) of the permitting authority. Under one of these alternatives (Option 1), the proposal would establish minimum requirements for conducting site inspections and providing certification as to design and completion of controls required by the permit authority in its NPDES permit. These requirements are similar to the inspection and certification requirements in Option 2. Existing compliance determination practices for construction site storm water controls rely principally on site inspections by local governments, however, enforcement efforts are reported to be uneven nationwide, largely due to limited enforcement resources at the Federal, State and local levels. The inspection and certification requirements in today's proposed rule could strengthen the current permit program.

Under another alternative (Option 3), no new requirements would be established under this option. Both the control requirements and the certification requirements would be left to the best professional judgement of the permitting authority in order to allow them to be better tailored to local conditions. These proposed options are discussed in more detail in sections IX and X of today's notice. At this time, EPA is co-proposing all three options because it sees advantages to each.

III. Background

A. Clean Water Act

Congress adopted the Clean Water Act (CWA) to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" (Section 101(a), 33 U.S.C. 1251(a)). To achieve this goal, the CWA prohibits the discharge of pollutants into navigable waters except in compliance with the statute. CWA section 402 requires "point source" discharges to obtain a permit under the National Pollutant Discharge Elimination System (NPDES). These permits are issued by EPA regional offices or authorized State agencies.

Following enactment of the Federal Water Pollution Control Amendments of 1972 (Public Law 92–500, October 18, 1972), EPA and the States issued NPDES permits to thousands of dischargers, both industrial (e.g. manufacturing, energy and mining facilities) and municipal (sewage treatment plants). As required under Title III of the Act, EPA promulgated effluent limitation guidelines and standards for many industrial categories, and these requirements are incorporated into the permits.

The Water Quality Act of 1987 (Public Law 100–4, February 4, 1987) amended the CWA. The NPDES program was expanded by defining municipal and industrial storm water discharges as point sources. Industrial storm water dischargers, municipal separate storm sewer systems and other storm water dischargers designated by EPA must obtain NPDES permits pursuant to section 402(p) (33 U.S.C. 1342(p)).

B. NPDES Storm Water Permit Program

EPA's initial storm water regulations, promulgated in 1990, identified construction as one of several types of industrial activity requiring an NPDES permit. These "Phase I" storm water regulations require operators of large construction sites to apply for permits (40 CFR 122.26(b)(14)(x)). A large-site construction activity is one that:

- Will disturb five acres or greater; or
- Will disturb less than five acres but is part of a larger common plan of development or sale whose total land disturbing activities total five acres or greater (or is designated by the NPDES permitting authority); and
- Will discharge storm water runoff from the construction site through a municipal separate storm sewer system (MS4) or otherwise to waters of the United States.

The Phase II storm water rule, promulgated in 1999, generally extends permit coverage to sites one acre or greater (40 CFR 122.26(b)(15)).

In addition to requiring permits for construction site discharges, the NPDES regulations require permits for certain MS4s. The local governments responsible for the MS4s must operate a storm water management program. The local programs regulate a variety of business activities that affect storm water runoff, including construction, and the components of these programs are described in section III.B.2 of today's document.

1. Storm Water Permits for Construction: General and Individual

Pursuant to the NPDES Phase I storm water regulations at 40 CFR 122.26, EPA and the States began issuing permits for storm water discharges from large construction sites in 1992. The Phase II rule requires that permits for smaller sites be obtained starting in 2003. A general description of the basic requirements for the Phase I and Phase II regulations follows.

a. General Permits. The vast majority of construction sites are covered by general permits. EPA and States use general permits to cover a group of similar dischargers under one permit. See 40 CFR 122.28. General permits simplify the application process for the industry, provide uniform requirements across covered sites, and reduce administrative workload for the permit authorities. EPA and the States have published documents containing the construction general permits, along with forms and related procedures. To obtain coverage under a general permit, the permittee—either the developer, builder or contractor for a construction project—submits a Notice of Intent (NOI) to the permit authority. The NOI takes the place of a lengthier application package that generally would be used for an individual NPDES permit. By submitting the NOI, the permittee agrees to the conditions in the published permit. The permittee may begin land disturbance after a specified interval (typically 48 hours) following NOI submission unless otherwise notified or specified by the permit authority.

b. EPA Construction General Permit. EPA's Construction General Permit (CGP) covers construction activities in six states, the District of Columbia, Puerto Rico, U.S. territories, and specifically designated portions of other states such as Indian Country and Federal facilities. The "national" CGP, covering all the EPA Regions except Regions 4, 5 and 6, was published on February 17, 1998 (63 FR 7898). EPA has placed a copy of the "national" CGP in the docket for today's proposal. Slightly different versions of the permit for Regions 4 and 6 were published on April 28, 2000 (65 FR 25122) and July 6, 1998 (63 FR 36490) respectively. (EPA does not issue NPDES permits for states within Region 5.) EPA intends to issue a revised CGP later in 2002 to incorporate requirements promulgated in the Phase II rule.

The principal requirement in the CGP is the preparation of a storm water pollution prevention plan (SWPPP) before submission of the NOI. EPA's guidance manual, "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices," (EPA 832/R–92–005, October 1, 1992; available on EPA's website at *http://www.epa.gov/npdes/stormwater*) describes the SWPPP process in detail. The plan must include a description of the site, with maps showing drainage, discharge points, and location of runoff controls; a description of the "best management practices" (BMPs) [1] used; inspection procedures and reports. A copy of the plan must be kept on the construction site from the date of project initiation to the date of final stabilization. Permittees do not routinely submit plans to the permit authority, but a copy must be readily available to authorized inspectors during normal business hours. EPA's construction general permit does not require that specific BMPs be contained in the SWPPP, except that temporary sediment basins shall be used on sites with 10 or more acres disturbed at one time. Rather, the permit describes the general areas the plan must address (e.g., minimization of erosion, containment of sediment on the site, proper handling of chemicals and debris, etc.) and leaves it to the operator to develop appropriate site-specific measures to accomplish these purposes.

EPA encourages multiple operators at a construction site to develop a comprehensive SWPPP. Other requirements in the CGP include conducting regular inspections and reporting releases of reportable quantities of hazardous substances.

To discontinue permit coverage, an operator must complete final stabilization of the site, transfer responsibility to another party (e.g., a developer transferring land to a home builder), or for a residential property, complete temporary stabilization and transfer to the homeowner. The permittee submits a Notice of Termination (NOT) Form to the permit authority upon satisfying the appropriate permit conditions described in the CGP.

c. State Construction General Permits. For the most part, the state general permits have followed EPA's format. Some states have modified requirements in their permits. For example, California has added discharge monitoring requirements for sites where the receiving water body is listed as impaired (water quality-limited) for sedimentation. (California State Water Resources Control Board, Resolution No. 2001–046, April 26, 2001; http://www.swrcb.ca.gov/resdec/resltn/2001/01res.html) and Georgia has added monitoring requirements for all sites (Georgia Department of Natural Resources, Environmental Protection Division, General NPDES Permit For Storm Water Discharges From Construction Activities, No. GAR100000, June 12, 2000; *http://*

[1] The term "best management practices" (BMP) is mentioned in a few sections of the Clean Water Act, and is used extensively in EPA regulations, guidance documents, state and local government documents, and many other technical publications. The term has a variety of meanings within the water quality literature, and is used in situations involving both point sources and nonpoint sources. BMPs can be procedures for operation and maintenance of municipal or industrial treatment plants, training courses for plant employees, public notification procedures, or agricultural waste handling practices, as well as both structural and non-structural techniques for controlling storm water discharges from any source. Within the storm water field, some publications use the term "BMPs" when referring to erosion and sediment controls. To avoid confusion, in today's document EPA is using the terms "erosion and sediment controls" (ESC) and "temporary BMPs" to describe the temporary controls used by construction site operators during the period of land disturbance, and "storm water management BMPs" to refer to the techniques and technologies designed and installed by operators for long-term control of storm water discharges.

www.DNR.State.Ga.US/dnr/environ/techguide_files/techguide.htm).

d. Individual Permits. A permit authority may require any site to apply for an individual permit rather than using the general permit. The individual permit is most often used for complex projects and/or projects located in sensitive watersheds. State storm water permit coordinators have informed EPA that this provision has been rarely used for construction activities.

2. Municipal Storm Water Permits and Local Government Regulation of Construction Activity

Many local governments, as MS4 permittees, have a role in the co-regulation of construction industries along with States and EPA, and are responsible for overseeing long-term maintenance of storm water management facilities. This section describes regulatory programs operated by MS4s.

a. NPDES Requirements. The NPDES storm water regulations require that MS4s apply for permits. In general, the Phase I rule covers MS4s serving populations of 100,000 or more. The Phase II rule extends coverage to most other MS4s in urbanized areas, and NPDES agencies may designate additional MS4s outside of urbanized areas for permit coverage based on State-specific criteria.

The regulations contemplate that each MS4 generally will operate a local storm water management program in order to properly control discharges into, and hence out of, its MS4. The Phase II MS4 regulations specifically anticipate a local program for regulating storm water discharges from construction activity and managing "post-construction" (long-term) runoff. Permits for Phase I MS4s, while not specifically required by the regulations to do so, typically administer such programs as well. See 40 CFR 122.26(d) for Phase I MS4s and 40 CFR 122.34(a) for Phase II MS4s. EPA has provided guidance to the NPDES agencies and MS4s that recommends components and activities for a well-operated local storm water management program.

b. EPA Guidance to Municipalities. EPA has issued several guidance documents to municipalities to implement the NPDES Phase II rule.

- National Menu of BMPs (*http://www.epa.gov/npdes/menuofbmps/menu.htm*). This document provides guidance to regulated small MS4s as to the types of practices they could use to develop and implement their storm water management programs. The menu includes descriptions of BMPs that local programs can implement to reduce impacts of storm water discharges from construction activities and long-term runoff.
- Measurable Goals Guidance (*http://www.epa.gov/npdes/storm water/measurablegoals*). This document assists small MS4s in defining performance targets for each of the six minimum measures described above. Included in the guidance are examples of goals for BMPs to control storm water discharges from construction activities and urban runoff.
- Storm Water Phase II Compliance Assistance Guide (EPA 833–R–00–002, March 2000, *http://cfpub.epa.gov/npdes/stormwater/smms4.cfm?program_id=6*). The guide provides an overview of compliance responsibilities for MS4s, small construction sites, and certain other industrial storm water discharges affected by the Phase II rule.
- Fact Sheets on various storm water control technologies, including hydrodynamic separators (EPA 832–F–99–017), infiltrative practices (EPA 832–F–99–018 and EPA 832–F–99–019), modular treatment systems (EPA 832–F–99–044), porous pavement (EPA 832–F–99–023), sand filters (EPA 832–F–99–007), turf reinforcement mats (EPA 832–F–99–002), vegetative covers (EPA 832–F–99–027) and swales (EPA 832–F–99–006), wet detention ponds (EPA 832–F–99–048). (All fact sheets published 1999. Available at *http://www.epa.gov/npdes/stormwater/*; click on "Publications.")

C. Other State and Local Storm Water Requirements

States and municipalities may have other requirements for flood control, erosion and sediment (E&S) control, and in many cases, storm water quality. Many of these provisions were enacted before the promulgation of the EPA Phase I storm water rule. All states have laws for E&S control, and these are often implemented by MS4's. A summary of existing state and local requirements is provided in the Development Document.

D. Effluent Guidelines and Standards Program

Effluent limitation guidelines and standards (hereinafter referred to as "effluent guidelines" or "ELGs") are technology-based requirements for categories of point source dischargers. These limitations are subsequently incorporated into NPDES permits. The effluent guidelines are based on the degree of control that can be achieved using various levels of pollution control technology, as defined in Title III of the CWA and outlined below.

1. Best Practicable Control Technology Currently Available (BPT)

In guidelines for a point source category, EPA may define BPT effluent limits for conventional, toxic,[2] and non-conventional pollutants. In specifying BPT, EPA looks at a number of factors. EPA first considers the cost of achieving effluent reductions in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the Agency deems appropriate (CWA section 304(b)(1)(B)). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performance of facilities within the category of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, EPA may require higher levels of control than currently in place in a category if the Agency determines that the technology can be practically applied. See "A Legislative History of the Federal Water Pollution Control Act Amendments of 1972," U.S. Senate Committee of Public Works, Serial No. 93–1, January 1973, p. 1468.

In addition, the Act requires a cost-reasonableness assessment for BPT limitations. In determining the BPT limits, EPA considers the total cost of treatment technologies in relation to the effluent reduction benefits achieved. This inquiry does not limit EPA's broad discretion to adopt BPT limitations that are achievable with available technology unless the required additional reductions are "wholly out of proportion to the costs of achieving such marginal level of reduction." See Legislative History, op. cit., p. 170. Moreover, the inquiry does not require the Agency to quantify benefits in monetary terms. See, for example, *American Iron and Steel Institute* v. *EPA*, 526 F. 2d 1027 (3rd Cir., 1975).

In balancing costs against the benefits of effluent reduction, EPA considers the volume and nature of expected discharges after application of BPT, the

[2] In the initial stages of EPA CWA regulation, EPA efforts emphasized the achievement of BPT limitations for control of the "classical" pollutants (e.g., TSS, pH, BOD_5). However, nothing on the face of the statute explicitly restricted BPT limitation to such pollutants. Following passage of the Clean Water Act of 1977 (Public Law 95–217, December 27, 1977) with its requirement for point sources to achieve best available technology limitations to control discharges of toxic pollutants, EPA shifted its focus to developing BAT limitations for the listed priority toxic pollutants.

general environmental effects of pollutants, and the cost and economic impacts of the required level of pollution control. In past effluent limitation guidelines and standards, BPT cost-reasonableness removal figures have ranged from $0.21 to $33.71 per pound removed in year 2000 dollars. In developing guidelines, the Act does not require consideration of water quality problems attributable to particular point sources, or water quality improvements in particular bodies of water. Accordingly, EPA has not considered these factors in developing the limitations being proposed today. See *Weyerhaeuser Company* v. *Costle*, 590 F. 2d 1011 (D.C. Cir. 1978).

2. Best Available Technology Economically Achievable (BAT)

In general, BAT effluent guidelines (CWA section 304(b)(2)) represent the best existing economically achievable performance of direct discharging plants in the subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the processes employed, engineering aspects of the control technology, potential process changes, non-water quality environmental impacts (including energy requirements), and such factors as the Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight to be accorded to these factors. An additional statutory factor considered in setting BAT is "economic achievability." Generally, EPA determines the economic achievability on the basis of the total cost to the subcategory and the overall effect of the rule on the industry's financial health. The Agency may base BAT limitations upon effluent reductions attainable through changes in a facility's processes and operations. As with BPT, where existing performance is uniformly inadequate, EPA may base BAT upon technology transferred from a different subcategory or from another category. In addition, the Agency may base BAT upon manufacturing process changes or internal controls, even when these technologies are not common industry practice.

3. Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT technology for discharges from existing point sources. BCT is not an additional limitation, but replaces Best Available Technology (BAT) for control of conventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two-part "cost-reasonableness" test. EPA explained its methodology for the development of BCT limitations in July 1986 (51 FR 24974).

Section 304(a)(4) designates the following as conventional pollutants: Biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979 (44 FR 44501). A primary pollutant of concern at construction sites, sediment, is measured as TSS.

4. New Source Performance Standards (NSPS)

NSPS reflect effluent reductions that are achievable based on the best available demonstrated control technology. New facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the greatest degree of effluent reduction attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, non-conventional, and priority pollutants). In establishing NSPS, CWA section 306 directs EPA to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements.

5. Pretreatment Standards

The CWA also defines standards for indirect discharges, i.e. discharges into publicly owned treatment works (POTWs). These are Pretreatment Standards for Existing Sources (PSES) and Pretreatment Standards for New Sources (PSNS) under section 307(b). Because EPA has identified no deliberate discharges directly to POTWs, EPA is not proposing PSES or PSNS for the Construction and Development Category. The information reviewed by the Agency indicates that the vast majority of construction sites discharge either directly to waters of the U.S. or through MS4s. In some urban areas, construction sites discharge to combined sewer systems (i.e., sewers carrying both storm water and domestic sewage through a single pipe) which lead to POTWs. Sediment is susceptible to treatment in POTWs, using technologies commonly employed such as primary clarification, and EPA has no evidence of interference, pollutant pass-through or sludge contamination.

6. Effluent Guidelines Plan and Consent Decree

Clean Water Act section 304(m) requires EPA to publish a plan every two years that consists of three elements. First, under section 304(m)(1)(A), EPA is required to establish a schedule for the annual review and revision of existing effluent guidelines in accordance with section 304(b). Section 304(b) applies to ELGs for direct dischargers and requires EPA to revise such regulations as appropriate. Second, under section 304(m)(1)(B), EPA must identify categories of sources discharging toxic or nonconventional pollutants for which EPA has not published BAT ELGs under section 304(b)(2) or new source performance standards under section 306. Finally, under section 304(m)(1)(C), EPA must establish a schedule for the promulgation of BAT and NSPS for the categories identified under subparagraph (B) not later than three years after being identified in the 304(m) plan. Section 304(m) does not apply to pretreatment standards for indirect dischargers, which EPA promulgates pursuant to section 307(b) and 307(c) of the Act.

On October 30, 1989, Natural Resources Defense Council, Inc. (NRDC), and Public Citizen, Inc., filed an action against EPA in which they alleged, among other things, that EPA had failed to comply with section 304(m). Plaintiffs and EPA agreed to a settlement of that action in a consent decree entered on January 31, 1992. (*Natural Resources Defense Council et al* v. *Whitman*, D.D.C. Civil Action No. 89–2980). The consent decree, which has been modified several times, established a schedule by which EPA is to propose and take final action for eleven point source categories identified by name in the decree and for eight other point source categories identified only as new or revised rules, numbered 5 through 12. EPA selected the Construction and Development category as the subject for New or Revised Rule #10. The decree, as modified, calls for the Administrator to sign a proposed ELG for the C&D category no later than May 15, 2002, and to take final action on that proposal no later than March 31, 2004. A settlement agreement between the parties, signed on June 28, 2000, requires that EPA develop regulatory options applicable to discharges from construction, development and redevelopment, covering site sizes included in the Phase I and Phase II

NPDES storm water rules (i.e. one acre or greater). EPA is required to develop options including numeric effluent limitations for sedimentation and turbidity; control of construction site pollutants other than sedimentation and turbidity (e.g. discarded building materials, concrete truck washout, trash); BMPs for controlling post-construction runoff; BMPs for construction sites; and requirements to design storm water controls to maintain pre-development runoff conditions where practicable. The settlement also requires EPA to issue guidance to MS4s and other permittees on maintenance of post-construction BMPs identified in the proposed ELGs. Further discussion of approaches not pursued by EPA at this time may be found in the docket for today's proposal.

E. Pollution Prevention Act

The Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101 *et seq.*, Public Law 101–508, November 5, 1990) makes pollution prevention the national policy of the United States. The PPA identifies an environmental management hierarchy in which pollution "should be prevented or reduced whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or release into the environment should be employed only as a last resort * * *" (42 U.S.C. 13103). In short, preventing pollution before it is created is preferable to trying to manage, treat or dispose of it after it is created. According to the PPA, source reduction reduces the generation and release of hazardous substances, pollutants, wastes, contaminants or residuals at the source, usually within a process. The term source reduction "* * * includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control. The term 'source reduction' does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to or necessary for the production of a product or the providing of a service." In effect, source reduction means reducing the amount of a pollutant that enters a waste stream or that is otherwise released into the environment prior to out-of-process recycling, treatment, or disposal.

Although the PPA does not explicitly address storm water discharges or discharges from construction sites, the principles of the PPA are implicit in many of the practices used to reduce pollutant discharges from construction sites. These include controls that minimize the potential for erosion such as proper phasing of construction, retention of on-site vegetation and stabilization of disturbed areas as soon as practicable. These controls and practices are described in section IX.A of today's document.

IV. Scope of Proposal

EPA is proposing three options, and soliciting comment on variations on these options, for further control of the discharge of pollutants in storm water associated with construction and development activities.

One proposed option (Option 2) would establish C&D effluent guidelines that would apply to construction site operators at sites with 5 acres or more of disturbed area. Under this option, an operator would be required to:

- Design, install and maintain erosion and sediment controls;
- Prepare a storm water pollution prevention plan;
- Inspect the site throughout the land-disturbance period; and
- Certify that the controls meet the regulatory design criteria or permit conditions, as applicable.

These provisions are explained in section X.D. of today's document. Today's proposal does not include requirements regarding the selection or implementation of long-term storm water controls at the sites using permanent BMPs. Under the NPDES storm water permit program, State and local governments are responsible for establishing requirements for permanent storm water controls, and for the maintenance of those permanent storm water controls. Today's proposed rule would not alter that responsibility. EPA has collected a significant body of technical information on the design and effectiveness of various permanent storm water controls that may assist State and local governments as they establish their requirements for construction and development activity. EPA anticipates releasing this document sometime after this proposal. EPA is also preparing a guidance manual on storm water BMP maintenance procedures to assist State and local governments and property owners. EPA anticipates releasing a final version of this document at the time of final action on this proposal in March of 2004. A draft of the document is included in the rulemaking record of this proposal.

EPA is also considering a variation on this option that would establish C&D effluent guidelines that would apply to construction site operators at sites with five acres or more of disturbed area. Under this variation an operator would be required to:

- Design, install and maintain erosion and sediment controls; and
- Prepare a storm water pollution prevention plan.

Under this variation Federal inspection and certification requirements would not be established; those provisions could be addressed at the local level.

Another proposed option (Option 1) would not establish C&D effluent guidelines, but rather would amend the NPDES storm water requirements for construction site operators subject to NPDES storm water requirements, i.e., operators of construction sites with one acre or more of disturbed area. (See section III.B of today's document for a summary of current permit requirements.) Under this option, an operator would be required to:

- Inspect the site throughout the land-disturbance period; and
- Certify that the controls meet the regulatory design criteria established by the Federal, Tribal, State or local government.

These provisions are explained in section X.D of today's document.

The final proposed option (Option 3) would not establish C&D effluent guidelines or amend the NPDES storm water requirements for construction site operators. Rather, this option would continue to rely on control practices and any certification and inspection requirements tailored to local conditions that established by the permitting authority on a BPJ basis.

V. Summary of Data Collection Activities

A. Existing Data Sources

In developing today's proposal, EPA collected and reviewed existing data from a variety of sources, including technical and professional literature; the National Storm Water Best Management Practices Database developed by the American Society of Civil Engineers (ASCE); the Agency's economic analysis for the Phase II NPDES storm water rule; State storm water and erosion and sediment control manuals and handbooks; EPA and State databases on construction general permits; the United States Department of Agriculture (USDA) National Resources Inventory; the Census of Construction; and the U.S. Army Corps of Engineers evaluation of

BMPs for small construction sites. Other information sources included Federal agencies such as the Securities and Exchange Commission and Small Business Administration (SBA); industry and trade association publications; university and nonprofit organization research centers; interviews with State and local officials; and interviews with industry representatives and consultants. EPA did not conduct any questionnaire surveys of the construction and development industry in preparing today's proposal.

EPA drew heavily on the mass of data related to erosion and sediment control, and storm water technology and BMP applicability and efficiency contained in the technical and scientific literature in order to develop today's proposal. Data sources collected and evaluated include published papers and journal articles, ASCE and International Erosion Control Association (IECA) conference proceedings, research reports from state and federal agencies such as USDA, U.S. Department of Transportation, State Departments of Transportation, and the Transportation Research Board. EPA conducted a detailed assessment of these data sources, the results of which are summarized in the Development Document for the Construction and Development Effluent Guidelines (see "Supporting Documentation"). The document summarizes efficiency data for most of the erosion and sediment controls in common usage. This literature and data summary was the main source of data used to evaluate BMP efficiency and applicability for today's proposal.

EPA also augmented these data sources with data contained in the National Storm Water BMP Database. This database is a comprehensive data storage and evaluation system developed by ASCE in cooperation with EPA. The database contains monitoring studies on storm water BMPs in a consistent and transferrable format in order to allow for a comprehensive evaluation and comparison of various BMP designs. Representative information provided for each BMP includes test site location, researcher contact data, watershed characteristics, regional climate statistics, BMP design parameters, monitoring equipment types, and monitoring data such as precipitation, flow and water quality. The database can be accessed at *http://www.bmpdatabase.org.*

The U.S. Census Bureau conducted the most recent Census of Construction in 1997. The Census provides data on the number, size, and geographic distribution of establishments; employment and payroll; financial information (such as revenues and expenses); specialization by type of construction; and amount and type of work subcontracted out. EPA relied on additional Census Bureau programs for data on market conditions in the industry. The Building Permits Program provided monthly data on the number of building permits issued for new residential construction. The annual Survey of Construction provided data on number of housing starts, completions, and units sold; characteristics of new homes (including size of home and building lot size); and value of construction put in place.

While the Census Bureau programs provide substantial data on business establishment characteristics and industry output, there is a noticeable lack of information linking establishment data to output measures. For example, the Census of Construction provides average and median revenues and value of construction for all establishments and for establishments by employment size class, but does not provide a distribution of establishments by number of housing units started or completed, number of construction permits issued, or number of acres developed. For EPA's economic analysis this was a significant data gap, since the proposed regulations would be implemented at the project level and the Agency developed its compliance cost estimates on a per-acre basis. This led EPA to develop a method for estimating the number of acres disturbed per establishment.

EPA was able to partially fill these data gaps using information contained in a special Census Bureau report ("1997 Economic Census; Construction Sector Special Study Housing Starts Statistics; A Profile of the Homebuilding Industry," July 2000). This report contains estimates of the number of homebuilding establishments by number of housing units built each year. EPA combined this information with data on the average lot size for new homes to estimate a distribution of establishments by number of acres disturbed. EPA also used data from this report to determine the number of small builders who are likely to disturb less than one acre of land per year and who therefore are not covered by the storm water permit program.

Another data source was important for further clarifying the size of the industry that is covered by the storm water permit program. The single-family and multi-family housing construction industries (NAICS 23321 and 23322) include establishments that are engaged in new construction as well as renovation of existing construction. Since renovation and remodeling activities generally do not disturb one acre or more of land per site, renovation and remodeling contractors would not be subject to the requirements being proposed today. To estimate the number of such contractors, EPA used data from a recent study completed by the Joint Center for Housing Studies at Harvard University. This report classified establishments that derive at least half of their revenues from remodeling activities as remodelers. Based on this definition, the Agency concluded that a substantial portion of the single-family and multifamily housing construction sector may not be affected by today's proposal. EPA requests comment on its assumption that firms which derive at least half their revenues from remodeling will not be affected by today's proposal.

EPA obtained information on home ownership rates, mortgage affordability, and interest rates from sources such as Fannie Mae and the Federal Housing Finance Board. Data on average costs of construction for various types of projects were obtained from R.S. Means Co. publications and the National Association of Home Builders (NAHB).

EPA obtained data on the amount of land converted from undeveloped to developed status from the National Resources Inventory (NRI). This is a statistical sampling program conducted by USDA every five years that defines geographic sampling points in terms of their land use status. The most recent NRI indicates that during the period 1992 to 1997, each year over 2.2 million acres of land previously classified as undeveloped were converted to developed status. For developed land, the NRI does not specify the type of use (i.e., single family homes, roadways, commercial or industrial sites). In order to estimate the number of acres converted by type of development, EPA used actual data or estimates of the number of projects permitted and the average size of projects, by type. For example, to determine the number of acres converted to residential housing development EPA multiplied the number of new homes permitted for construction each year by the average lot size for new construction. For non-residential construction, EPA had to fill a data gap created when the Census Bureau ceased, in 1995, collecting information on the number of nonresidential building permits issued. The Agency used historical (pre-1995) data on nonresidential starts to establish a relationship between residential and nonresidential starts from which current nonresidential activity could be

estimated. To stratify the aggregate amount of land converted to developed status by size of development project, EPA used data on construction project size collected from 14 municipalities in support of the NPDES Phase II storm water regulations (Economic Analysis of the Phase II Storm Water Rule, Final Report, October 1999.)

B. Storm Water Discharge Sampling and Site Visits

At the time of this proposal, EPA is planning to conduct sampling and analysis of discharges at a number of construction sites in order to better characterize the pollutants commonly found in construction site runoff. EPA has also funded several cooperative agreements evaluating construction site pollutant loadings, erosion and sediment control effectiveness, and receiving water impacts of land development activities.

C. Industry-Supplied Data

EPA has reviewed reference publications and data prepared by industry organizations including NAHB, the Construction Financial Management Association and the Urban Land Institute. The Agency received cost data and comments from several construction and development businesses during the Small Business Advocacy Review conducted in 2001. (This review is described in section XIX.C of today's document.)

NAHB submitted a report that presents an independent evaluation of the data contained in the initial release of the National Stormwater BMP Database. (National Association of Home Builders, "Erosion and Sediment Control Best Management Practices Research Project." Washington, DC, 2000). The report is included in the rulemaking record.

D. Summary of Public Participation

EPA conducted an introductory public meeting in April 1999 describing the effluent guidelines development process and the regulatory issues being considered for the C&D rule. In the Summer of 2001 EPA conducted two additional meetings to provide an update of progress on the rule development.

Since the beginning of the rule project in 1998, EPA has held meetings with industry associations, State and local government officials, professional organizations and citizen groups on the C&D rule. In 2000–01, EPA conducted interviews and group discussions with builders and developers to learn about the land development process, builder-developer organizational structures, operational and business practices, and business trends in greater detail.

In 2001 EPA conducted a Small Business Advocacy Review panel pursuant to the Small Business Regulatory Enforcement Fairness Act (SBREFA). A discussion of this process and findings are discussed in section XIX.C of today's document.

VI. Industry Profile

A. Affected Industry Sectors

The construction and development category covers establishments classified by the Census Bureau into two subsectors.

- The Building, Developing and General Contracting subsector (NAICS 233) includes land subdivision and development, and building construction (residential and nonresidential). Land developers select construction sites, conduct site planning and design activities, and carry out other tasks such as financing and marketing. General contractors build residential, industrial, commercial and other buildings.
- Heavy Construction contractors (NAICS 234) build sewers and other utilities, roads, highways, bridges and tunnels.

A single construction project may involve many firms from both subsectors. The number of firms involved and their financial and operational relationships may vary greatly from project to project.

The residential building industries have their own variety of operational relationships. Many home building projects are initiated and managed by a developer, using one or more general contractors to supervise and/or carry out the physical construction activities. Other projects are operated by "merchant" builders. A merchant builder is a firm that develops property, constructs homes, and markets the final product within the same company. Although these functions may be conducted by different entities, the merchant builder conducts all of these activities within the same firm. In the past, industry members used the term "operative builder" to refer to a firm that conducts these activities within the same firm. The merchant builder is organized into divisions or departments within the firm and each division or department is responsible for different functions, e.g. land development, construction, marketing.

Most builders and developers are separate entities. Typically, the developer acquires property and moves the project from raw land to finished lots. The lots are usually sold to builders who construct houses, commercial/shopping centers, office and industrial parks, and other products for the final consumer. In some situations home builders will construct speculatively without a contract. In other cases the home buyer will contract with a builder for a specific house. The builder hires subcontractors for carpentry, plumbing, electrical, and other services.

Some of the operating characteristics of the heavy construction subsector include: (1) Usually government agency clients rather than private customers, (2) public sector clients typically issue specifications to cover many projects (e.g., a highway agency publishes road construction standards for all projects in its jurisdiction), and (3) frequent use of unit price contracts (e.g., a local public works agency contracts for installation of a quantity of sewer pipeline). The relationship between the heavy construction firm and the public customer is typically established through a competitive bid process. Private sector customers may initiate projects through negotiated contracts.

EPA understands that in typical construction projects the firms identifying themselves as "operators" under a construction general permit are general building contractors and/or developers.[3] While such projects may use the services of specialty contractors such as excavation companies, these firms are typically subcontractors to the general building contractor and are not identified as operators in the storm water permit. Other classes of subcontractors such as carpentry, painting, plumbing and electrical services typically do not apply for, nor receive, NPDES permits and EPA is not including these businesses in its population estimates for the purpose of today's proposed rule. EPA is also excluding businesses classified by the Census Bureau as "non-employer" establishments. These establishments tend to be proprietorships with the owner providing individual construction services to the industry, and they are primarily engaged in activities, such as remodeling, that disturb little if any land.

B. Construction and Development Activities Affecting Water Quality

1. Planning and Site Design

Land development tasks that can affect pollutant discharges typically include the following activities:

[3] Under the CGP, a property owner who is not a developer or contractor, e.g., a corporation erecting an office building for its own use, may be designated as a co-permittee if it retains control over site plans.

- Site selection and analysis;
- Design of subdivision and lot sizes in residential and mixed-use projects;
- Design of infrastructure (roads, sewers, utility lines, etc.).

In many cases, particularly on smaller projects, a land owner may manage these tasks directly without the involvement of a real estate developer. In larger projects, real estate developers usually manage the project, especially when local government requirements and approval processes are complex. This is often the case for residential developments, mixed-use projects (involving housing, commercial and/or other land uses), shopping centers and large office buildings and complexes.

A real estate developer initiating a project will typically have a particular kind of project in mind (such as residential or commercial), but may not have identified a particular site. The developer may formulate a conceptual plan for the project and then search for sites that could accommodate such a plan. During the site selection process many factors are taken into consideration by the developer, and included among these may be the presence of water bodies on or near the site. For example, the developer may consider on-site water features to be an amenity that can add value to the site. On-site water body characteristics may dictate how structures can be located on the site to avoid flooding. Some properties may have limitations if on-site or adjacent water bodies have regulatory designations such as riparian buffers, flood plains and wetlands.

Once a site has been selected and control of the property is obtained (through purchase, lease, option to purchase, etc.), the developer can proceed with site analysis, design and initial proposals for local government approval. Site analysis includes examination of topography, soils, and hydrology. Site design tasks depend on the planned uses for the land (residential, commercial, institutional, etc.) and may involve subdivision of the site into individual home lots; locating commercial, institutional or industrial buildings; locating streets, sidewalks and/or parking areas; and placement of utilities, including storm drainage systems. Planning for storm water management during the early stages of project formulation allows for consideration of site designs that can reduce the overall water quality impacts of the site. One such planning strategy, "Conservation Design," includes avoiding natural wetland areas, preserving existing trees and vegetation, maintaining stream buffers, limiting the extent of clearing and grading activities, and identifying highly infiltrative soil areas for preservation. (See "Growing Green," Natural Lands Trust, Inc., Media, PA. Available at *http://www.natlands.org/planning/planning.html*.) The site design is subject to local government approval, and multiple agencies may be involved, depending on the size and complexity of the site and the requirements of master planning or zoning agencies. Once the appropriate government approvals have been obtained, the permittee may proceed with ground breaking activities. (D. Linda Kone, "Land Development," Washington, DC: Home Builders Press, 2000).

2. Clearing, Excavating and Grading

Construction on any size parcel of land almost always calls for a remodeling of the earth. Therefore, actual site construction typically begins with site clearing and grading. Earthwork activities are important in site preparation because they ensure that a sufficient layer of organic material—ground cover and other vegetation, especially roots—is removed. The size of the site, extent of water present, the types of soils, topography and weather determine the types of equipment that will be needed during site clearing and grading. Material that will not be used on the site must be hauled away by tractor-pulled wagons, dump trucks or articulated trucks.

Clearing activities involve the movement of materials from one area of the site to another or complete removal from the site. Equipment used for lifting excavated and cleared materials include aerial-work platforms, forwarders cranes, rough-terrain forklifts, and truck-mounted cranes. Truck loaders are used for digging and dumping earth.

Excavation and grading may be performed by several different types of machines. They can also be done by hand, but this is generally more labor-intensive and more expensive. When grading a site, builders typically take measures to ensure that new grades are as close to the original grade as possible, so as not to create a dis-equilibrium, especially to avoid erosion and storm water runoff. Proper grade also ensures a flat surface for development and is designed to attain proper drainage away from the constructed buildings.

Equipment used during excavation and grading include backhoes, bulldozers, loaders, directional drilling rigs, hydraulic excavators, motor graders, scrapers, skid-steer loaders, soil stabilizers, tool carriers, trenchers, wheel loaders and pipeliners. The type of equipment used generally depends on the functions to be performed and on specific site conditions.

Shaping and compacting the earth is an important part of site preparation. Earthwork activities might require that fill material be used on the site. In such cases, the fill must be spread in uniform, thick layers and compacted to a specific density. An optimum moisture content must also be reached. Graders and bulldozers are the most common earth-spreading machines. Compaction is most often accomplished with various types of rollers.

For removal of rock from the site, the contractor must first loosen and break the rock into small pieces. This can be accomplished by drilling or blasting. Drilling equipment includes jackhammers, wagon drills, drifters, churn rills, and rotary drills. Dynamite and other explosives can be used to loosen rock.

Once materials have been excavated and removed and the ground has been cleared and graded, the site is ready for construction of buildings, roads, and/or other structures.

3. Erosion and Sediment Control

During the land disturbance period, affected land is generally exposed after removal of grass, rocks, pavement and other protective ground covers. Where the soil surface is unprotected, soil and sand particles may be easily picked up by wind and/or washed away by rain or snow melt. This process is called erosion. The water carrying these particles eventually reaches a water body. The particles are deposited in the water body, a process called sedimentation. Descriptions of the environmental impacts of construction site runoff are provided in section XV of today's document.

Contractors use erosion and sediment controls (ESCs) to mitigate these impacts. Erosion controls include mulching, vegetative filter strips, diversion berms and conveyance channels, slope drains, bonded fiber matrices, and rolled products such as turf reinforcement mats. These materials and methods are intended to reduce erosion where soil particles can be initially dislodged on a construction site, either from rainfall, snow melt or up-slope runoff. Erosion controls may not be completely effective, and sediment controls are typically employed in addition. Sediment controls include sediment basins, ponds, and traps; and barrier methods such as silt fences, straw bales and rock barriers. ESCs are further described in section VIII of today's document.

4. Control of Other Pollutants

Construction activity generates a variety of waste materials. These materials may include concrete truck rinsate, trash, and other pollutants. Construction site operators utilize various practices to manage these wastes and minimize discharges to surface waters, including:

- Neat and orderly storage of chemicals, pesticides, fertilizers, and fuels that are being stored on the site;
- Regular collection and disposal of trash and sanitary waste;
- Prompt cleanup of spills of liquid or dry materials.

These procedures are described in EPA's 1992 guidance, "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices" (op. cit.), State and local government documents pertaining to construction sites, and in section VIII of today's document.

5. Final Stabilization and Long-Term Storm Water Management

Construction activities on previously undeveloped land areas can significantly alter the hydrology of a site. In order to avoid flooding on the site and protect the newly constructed structures, the builder must design drainage facilities. The builder's site plans, as approved by the local government, specify the location of buildings and other structures, and typically indicate the site's drainage patterns and facilities for long-term storm water management. The plans may specify permanent storm water management facilities (or BMPs) to be constructed on the site, to control flooding, and in some cases, to protect receiving water quality. No single BMP type can address all storm water problems. Each type has certain limitations based on the drainage area served, available land space, cost, pollutant removal efficiency, as well as a variety of site-specific factors such as soil types, slope and depth of groundwater table. Storm water management BMPs are further described in section VIII of today's document.

VII. Storm Water Discharge Characteristics

Since 1972, EPA and the States have made good progress in issuing discharge permits for a wide range of point sources dischargers. These permits have made dramatic improvements in water quality conditions and are largely responsible for much of the success in reducing water pollution. Most of these permits are for continuous discharges with predictable effluent quality and quantity that occur in both wet and dry weather conditions.

Construction disturbance activities can generate a broad range of environmental impacts by altering the physical characteristics of the affected land area. Construction activities typically involve the clearing, surface stripping, grading, and excavation of existing vegetation followed by the active construction period when the affected land is usually left denuded and the soil compacted, often leading to an increase in storm water runoff and higher rates of erosion. The most significant pollutant associated with construction activity at most sites is sediment. Total suspended solids (TSS) concentrations from uncontrolled construction sites have been found to be up to 150 times greater than concentrations from undeveloped land.[4] If the denuded and exposed areas contain contaminants, such as nutrients, pathogens, metals or organic compounds, they are likely to be carried at increased rates to surrounding water bodies via storm water runoff. The denuded construction site is only a temporary state, often less than six months. When the land is restored with the replanting of vegetation after construction is completed, the hydrology of the site may be altered. For example, the completed construction site may have a greater proportion of impervious surface than prior to site development, leading to changes in the volume and velocity, and in some cases temperature, of storm water runoff.

VIII. Description of Available Technologies

A. Introduction

Construction and development activities have the potential to discharge pollutants to surface waters due to poor or inadequate site design, planning and BMP implementation. These impacts can be mitigated by the application of design techniques to preserve or avoid areas prone to erosion and through the use of erosion and sediment controls. The use of good site design and planning techniques also can reduce pollution control costs and improve the effectiveness of pollution control strategies and practices. Good site design can also integrate, to the extent appropriate, practices to control erosion and sedimentation at active construction sites with practices to control post-construction runoff. For example, site plans may provide for the conversion of short-term sediment control practices such as sediment basins into extended detention wet ponds or other long-term structural BMPs.

A discussion of technologies and BMPs is contained in the following sections of today's document. Some states and local governments have also published detailed manuals for ESC and or storm water management controls. Links to on-line publications are available on EPA's website at http://www.epa/gov/OST/guide/construction.

B. Erosion and Sediment Controls and Other Site Management Practices

1. Goals

Construction site activities should be managed to reduce erosion, and to the extent practical, retain sediment on the site. Erosion and sedimentation are two separate processes and the practices to control them differ. "Erosion is the process of wearing away of the land surface by water, wind, ice, gravity, or other geologic agents. Sedimentation is the deposition of soil particles, both mineral and organic, that have been transported by water, wind, air, gravity or ice" (adapted from North Carolina Erosion and Sediment Control Planning and Design Manual, September 1, 1988).

Erosion can be prevented or minimized by various methods and practices. The main strategies used to reduce erosion include minimizing the time bare soil is exposed, preventing the detachment of soil and reducing the mobilization and transportation of soil particles off-site.

Decreasing the amount of land disturbed can significantly reduce sediment detachment and mobilization and overall erosion and sediment control costs. After land has been disturbed, exposed soils should be covered as soon as possible and runoff should be actively managed to prevent run-on flows from off-site areas and uncontrolled runoff from the disturbed area(s). In addition, runoff should be managed to prevent high runoff velocities and concentrated flows that are erosive. The continued effectiveness of erosion controls also is dependent on frequent inspections of erosion control practices to identify maintenance needs.

The control of sediment detached and mobilized through erosional processes requires a separate set of management practices. Several mechanisms can be used to remove suspended sediments in runoff. They include: filtration, settling and chemical precipitation. These mechanisms are used to trap, filter or

[4] TSS is an "indicator" parameter used to measure sediment discharges. The analytical test procedure for TSS is called "Residue-Nonfilterable." EPA-approved analytical methods for TSS are listed in 40 CFR part 136, Table I.B.

settle soil particles so they do not enter surface waters.

More detailed descriptions of sediment and erosion controls can be found in the Development Document.

2. Major Categories of Best Management Practices

Planning is the most critical element in designing an effective strategy to control erosion and sedimentation on construction sites. The protection of areas prone to erosion, the selection and siting of erosion and sediment control practices and the continued effectiveness of these systems will depend on a well defined plan.

Erosion and sediment control (ESC) plans and site plans provide the blueprints for the protective activities that will occur on the construction site. The ESC and site plans may also contain descriptions of temporary practices such as sediment basins that will be converted into long-term storm water management practices.

Several general objectives should be addressed in an effective ESC plan:

- Minimize clearing and grading activities;
- Protect waterways and stabilize drainage ways;
- Phase construction to limit soil exposure;
- Stabilize soils as soon as practicable;
- Protect steep slopes and cuts;
- Install perimeter controls to filter sediment;
- Employ sediment settling controls.

To ensure that builders and contractors implement effective ESC plans, MS4s may employ several other program elements. These elements include an ESC plan review process; contractor education; training, licensing and certification programs, and an inspection and enforcement process. See EPA's MS4 "Menu of BMPs" website at *http://www.epa.gov/npdes/menuofbmps/menu.htm* for descriptions of these activities.

The use of erosion controls is widely recognized as being the most cost-effective way of managing sediment on construction sites. Typical practices used to prevent and reduce soil movement include: reducing the overall area of disturbed land, minimizing the time soils are exposed to precipitation, scheduling clearing and grading events to reduce the probability that bare soils will be exposed to rainfall, preventing off-site and on-site runoff from eroding soils through the use of berms, conveyances or energy dissipation devices, covering soils or stockpiles, stabilizing exposed soils as soon as possible, and inspecting and maintaining erosion controls on a periodic basis, e.g., after each storm event. Vegetative stabilization using annual grasses is the most common practice used to control erosion. Polymers, physical barriers such as geotextiles, straw, and mulch are other common methods of controlling erosion.

Despite the proper use of erosion controls, some sediment detachment and movement is inevitable. Sediment controls are used to control (direct) and trap sediment that is entrained in runoff. Typical sediment controls include perimeter controls such as silt fences constructed with filter fabric, straw bale dikes, berms or swales. Trapping devices such as sediment traps and basins and inlet protectors are examples of in-line sediment controls. Sediment traps and basins are the primary method used to treat and settle out sediment for small and large disturbed areas.

Construction site operators manage building materials and waste to reduce and eliminate potential water quality impacts. Construction materials and chemicals should be handled, stored and disposed of properly to avoid contamination of runoff. Site management plans typically include elements such as spill prevention and remediation plans, nutrient management plans for vegetative stabilization efforts, and provisions for human waste disposal, e.g., portable toilets.

C. Long-Term Storm Water Management Control

1. Goals

After completion of construction, a variety of measures have been adopted to prevent flooding and achieve local resource protection goals, such as groundwater recharge or maintaining stream stability. For example, BMPs are often integrated into the overall site design, and generally approved by the local government. A number of States have developed storm water BMP selection and design criteria for use in their state. In addition, the Water Environment Federation (WEF) and the American Society of Civil Engineers (ASCE) have developed a methodology for storm water BMP design. (Water Environment Federation and the American Society of Civil Engineers, "Urban Runoff Quality Management." 1998. WEF Manual of Practice No. 23 and ASCE Manual and Report on Engineering Practice No. 87. Available for purchase at http://www.wef.org and http://www.asce.org).

2. Major Categories of Best Management Practices

Planning and site design are important to ensure the selection of site designs that will meet the needs of the owner and be compatible with local infrastructure. State and local governments have a primary role in ensuring proper planning and the design of structural storm water runoff conveyance and treatment systems.

Under any design approach, runoff flow paths are designed to route the runoff though functional landscaped areas or structural BMPs that store, infiltrate, evaporate, and slow the velocity of the runoff. Storage basins, swales, bioretention cells (highly permeable engineered soils planted with vegetation), grading to alter topography, increase infiltration and decrease erosion, and depression storage are the most typical practices used to manage runoff and reduce pollutant loadings. More innovative practices include rooftop storage, "green" roofs (landscaped roof systems designed to store and treat storm water), re-vegetation, rainwater capture and reuse, street filters (systems for treatment of street and highway runoff), and soil amendments.[5]

Pollution prevention practices are often called source reduction practices or "non-structural" BMPs. Education, training as well as proper inspections and maintenance are the primary methods to achieving pollution prevention objectives. Information dissemination via outreach efforts, professional training, licensing and certification combined with effective voluntary incentives, enforcement and compliance efforts are essential to good practice. Product substitution or the use of alternative methods and practices are also considered facets of pollution prevention.

[5] Low Impact Development (LID) is a site design approach that incorporates conservation techniques along with an integrated set of small site-level landscape runoff treatment and control features that are uniformly distributed throughout the site in order to prevent runoff pollution and reduce the impacts of development and redevelopment activities on water resources. ("Low Impact Development Design Strategies: An Integrated Design Approach," EPA 841–B–00–003, January 2000. Available on EPA's website at http://www.epa.gov/owow/nps/urban.html). Approaches similar to LID, although sometimes using different terminology, include "Better Site Design" ("Introduction to Better Site Design." Article no. 45 in *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City, MD, 2000. http://www.stormwatercenter.net) and "Infiltration Approach" ("Start at the Source: Design Guidance Manual for Stormwater Quality Protection," Bay Area Stormwater Management Agencies Association, Oakland, CA, 1999).

IX. Development of Effluent Limitation Guidelines and Standards

A. Industry Subcategorization

EPA may divide a point source category into groupings called "subcategories" to provide a method for addressing variations between products, processes, and other factors which result in distinctly different effluent characteristics. Regulation of a category by using formal subcategories provides that each subcategory has a uniform set of effluent limitations that take into account technological achievability and economic impacts unique to that subcategory. In some cases, effluent limitations within a subcategory may be different based on consideration of these same factors which are identified in section 304(b)(2)(B) of the CWA, 33 U.S.C. 1314(b)(2)(B). The CWA requires EPA, in developing effluent limitation guidelines and pretreatment standards, to consider a number of different factors, which are also relevant for subcategorization. The statute also authorizes EPA to take into account other factors that the Agency deems appropriate. One potential benefit of grouping similar facilities into subcategories is the increased likelihood that the regulations will be practicable, and it diminishes the need to address variations between facilities through a variance process (*Weyerhaeuser Co.* v. *Costle*, 590 F.2d 1011, 1053 (D.C. Cir. 1978)).

In preparing today's proposal, EPA considered several ways of subcategorizing the construction and development industry. Methods considered by the Agency include subcategorization by site size (such as disturbed acreage), development type (such as residential, commercial, industrial and transportation), re-development vs. "greenfield" development (development on rural or agricultural land), geography and hydrology (such as average annual rainfall and soil erosivity), as well as builder or developer size (in terms of annual revenue, annual units constructed, annual land disturbance, etc.).

1. Subcategorization by Site Size

EPA is not proposing to subcategorize site sizes of 10 acres or more. EPA is concerned, however, that as site sizes decrease below 10 acres the choice of controls within site design parameters may become more limited. For this reason, EPA is proposing in Option 2 to establish slightly modified requirements that provide greater flexibility for sites disturbing less than 10 acres. Specifically, EPA is proposing to require sediment basins where attainable for sites disturbing 10 acres or more, while leaving greater flexibility in the choice of sediment controls for sites disturbing less than 10 acres. EPA requests comment on this proposed subcategorization.

Under today's proposal, Option 2, which includes both control requirements and certification and inspection requirements, would apply to sites disturbing 5 or more acres, while Option 1, which includes certification and inspection requirements only, would apply to sites disturbing 1 acre or more. EPA is not proposing control requirements for sites less than 5 acres at this time in order to allow the maximum flexibility to the States in balancing the costs, availability, and effectiveness of erosion and sediment controls and to provide time for the States to demonstrate the effectiveness of permits to control discharge of pollutants associated with construction activity disturbing one to 5 acres under Phase II. EPA recognizes that this same logic may apply to the certification and inspection requirements and requests comment on adopting Option 1, but with a cutoff of 5 acres rather than 1 acre. More generally, EPA requests comment on the appropriate acreage cutoff for both Options 1 and 2.

2. Subcategorization by Industry

EPA is not, at this time, proposing subcategorization by industry or industry group (i.e. residential building, non-residential building, heavy construction). EPA recognizes that there are profit differentials between industry groups that could affect their economic and financial status. Based upon EPA's current cost estimates for the options being proposed today, EPA has found these options to be economically achievable for all industry groups. EPA is concerned about the practical difficulty in defining an appropriate industry portion to be subject to alternative standards, or an appropriate industry portion for whom the controls being employed today would be technically or economically infeasible. Since a large number of development projects (especially larger projects) can consist of mixed land uses (such as a large residential subdivision built along with a commercial/retail center), a subcategorization by industry may also present implementation challenges. EPA requests comment on possible industry subcategorization and how to address the implementation issues associated with such subcategorization.

3. Subcategorization by Builder/Developer Size

EPA is not, at this time, proposing subcategorization by builder, developer or contractor firm size (in terms of annual construction output, revenue, or acreage disturbed). Since the dollar value of a project or revenue of a builder or developer is not necessarily related to site size or disturbed area (due, in part, to differences in various markets), EPA has not found a direct correlation between any of these factors and the amount of pollutants in storm water discharges to receiving waters.

4. Subcategorization Based on Hydrology, Soil Loss Potential or Other Geographic Factors

EPA also considered subcategorizing the industry based on hydrology and potential for soil loss, but determined that the existing soil loss waiver included in the NPDES Phase II regulations (40 CFR 122.26(b)(15)(i)(A)) is sufficient for exempting sites with low expected soil loss.

Geographic factors that may be appropriate for subcategorizing the industry are based on low expected rainfall, defined periods of dry and wet weather, and/or construction during cold weather where the ground is frozen. On sites with these characteristics, the Agency expects soil erosion to be minimal. Option 2 in today's proposal would continue the provision in EPA's current CGP for delaying implementation of site stabilization due to these geographic factors. See § 450.21(h).

5. Subcategorization Based on Past Land Use

EPA considered subcategorization of the industry based on past land use, such as classifying redevelopment sites differently from "greenfield" projects. Redevelopment projects present some significant challenges in terms of erosion and sediment control due to the potential for site constraints and conflicts such as size, location, proximity to existing development, pre-development site contamination issues, land costs, as well as the nature of surrounding development. In addition, redevelopment projects are commonly perceived to be preferable to greenfield development, due to the proximity of redevelopment sites to existing infrastructure, the need to revitalize older neighborhoods, and the potential for providing significant economic stimulus to existing neighborhoods. As a result, many communities offer incentives in order to encourage redevelopment projects and to make the

economics of the project viable. Imposition of expensive storm water and erosion control requirements in such cases, in light of the constraints present, may inflict costs that render some projects to be economically unattractive to a developer. EPA does not believe that the level of controls being proposed in Option 2 today will be a significant disincentive to redevelopment. Much of the redevelopment occurring in urban areas involves sites of less than 5 acres in disturbed land. For the redevelopment that exceeds that site size, EPA believes that it is appropriate to require a comparable level of erosion and sediment control as is provided at greenfield sites. The design and implementation of those controls, while comparable, may be very different for a site that has the advantage of existing stormwater management infrastructure than for other sites. In either case, EPA believes that the requirements being proposed provide sufficient flexibility to allow affordable choices for both greenfield development and redevelopment activities.

B. Regulatory Options Considered

In developing today's proposal, EPA initially evaluated several regulatory options for both erosion and sediment control and other temporary BMPs, storm water management, and options that would not establish effluent limitation guidelines regulations. The erosion and sediment control (ESC) options represent the controls that are typically temporary and are used during the land-disturbing activities. The storm water management options represent the long-term (permanent) storm water controls that are designed and installed by the C&D industry at the time of construction but are intended to reduce long-term storm water impacts.

The following sections of today's document discuss the regulatory options that EPA considered for today's proposal. Section X describes the specific options contained in today's proposal.

1. Overview of Regulatory Options: Erosion and Sediment Controls and Other Temporary BMPs

For erosion and sediment control and other temporary BMPs, EPA considered a series of regulatory options. These options are designed to control the discharge of sediment, storm water and other pollutants from sites when construction is taking place. Construction and development activity involves land disturbed from previous uses such as agriculture or forest lands, or occurs as redevelopment of existing rural or urban areas. During the construction process, vegetation or surface cover is typically removed and soils become more available for transport and discharge from construction sites. Today's proposal provides regulatory tools to improve management and control on construction sites to reduce and minimize soil, storm water, and pollutant transport and discharge from construction sites.

EPA initially considered a range of options that incorporate varying levels of management and various control strategies for sites of 1 acre or more. During the Agency's outreach activities in advance of proposal, small entity representatives expressed concern over the complexity of overlapping and potentially inconsistent Federal, State, and local storm water regulations. These individuals questioned whether it was appropriate to be considering additional Federal storm water regulations at such an early stage in implementation of the existing storm water program. They further questioned EPA's assumptions regarding the level of control that would be achieved by sites less than 5 acres under the NPDES Phase II requirements, pointing out that the compliance deadline for those sites has not yet passed.

As EPA evaluated the options for erosion and sediment controls and other temporary BMPs, the Agency examined the merit of excluding sites less than 5 acres at this time. EPA estimates that while only 30 percent of sites developed each year are 5 acres or more, these sites represent over 80 percent of the disturbed acreage. The Agency believes that the phased approach to issuing permits for construction and development has allowed, and will continue to allow, EPA and States to improve coordination, communication, and implementation of requirements in a more strategic way. By focusing first on the larger sites, EPA and the States are focusing resources on the universe of sites that have the greatest potential for reducing discharge of pollutants to surface waters. These sites generally have more control alternatives than smaller sites, and greater flexibility in designing erosion and sediment controls that work within overall site parameters. Implementation of erosion and sediment controls under the NPDES Phase I storm water rule has demonstrated that even though controls may be more limited for sites as small as 5 acres, sufficient alternatives are available to provide significant control. Indeed, while many of the erosion and sediment control practices are not dependent on site size, others (such as sediment basins) are not always appropriate for smaller sites. Other factors also affect the availability of certain control practices. As the site size decreases, the proportion of sites that are "in-fill" projects constructed between currently-developed properties, or redevelopment of existing properties, likely increases. These projects present some significant challenges in terms of erosion and sediment control due to the potential for site constraints, land availability and costs, proximity to existing development, as well as the nature of surrounding development. EPA is proposing not to establish effluent limitation guidelines for sites smaller than 5 acres at this time in order to allow the maximum flexibility to the States in balancing the costs, availability, and effectiveness of erosion and sediment controls and to provide time for the States to demonstrate the effectiveness of permits to control discharge of pollutants associated with construction activity disturbing one to 5 acres under Phase II. The following discussion presents the options that EPA considered for erosion and sediment controls and other temporary BMPs.

- *Codify the EPA Construction General Permit*

EPA considered an option (a variation on Option 2 being proposed today) that would essentially codify the provisions contained in EPA's construction general permit (CGP) as minimum national standards for erosion and sediment control (i.e., for all states, not only those with EPA as permitting authority). The CGP requirements that would be codified include preparing a Storm Water Pollution Prevention Plan (SWPPP) or equivalent, provisions for installing and sizing sediment basins on sites with more than 10 acres of disturbed land, requirements for providing cover on exposed soil areas within 14 days after construction activity has ceased, and installation and maintenance of other erosion and sediment control practices and other temporary BMPs on all construction sites.

- *Codify the EPA Construction General Permit, Require Self-Inspection and Certification*

EPA considered an option (being proposed today as Option 2) that would essentially codify the provisions contained in EPA's construction general permit (CGP) as minimum national standards for erosion and sediment control and add inspection and certification requirements to improve operator accountability. The CGP requirements that would be codified are

the same as in the previous option. In addition, EPA incorporated mandatory site inspection, maintenance and reporting provisions by site owners and operators in order to improve confidence in the implementation and performance of construction site erosion and sediment controls in this option. These certification provisions may be accomplished either through self-inspection by a qualified employee of the owner and operator (such as a professional engineer or person trained in erosion and sediment control techniques) or inspection by a third-party (such as a consulting firm). The certification provisions would consist of a checklist-type certification form that the permittee would be required to complete at various stages of the project to certify that the provisions contained in the permittee's SWPPP are being implemented. Permittees would be required to conduct periodic inspections in order to confirm that the permittee is conducting the maintenance necessary to maintain the functionality of BMPs. The specific activities requiring certification include: SWPPP preparation; installation of perimeter controls and sediment controls; site inspections every 14 days; final stabilization of exposed soils and removal of temporary erosion & sediment controls. The certification and inspection forms would be retained on the site, and made available to the permitting authority and the public upon request. This option is being proposed as Option 2 in today's document (see section X).

• *Numerical Design Requirements*

EPA considered an option that would establish numerical requirements for the design of sediment basins and traps that would vary based on local or regional rainfall patterns and site-specific soil types. However, EPA determined that there were insufficient data available to establish national criteria of this type, and therefore did not include this requirement in today's proposed rule. In addition, this approach would be a significant departure from the current CGP sizing requirements, which establishes a requirement a calculated volume of runoff from a 2-year, 2-hour storm, or for 3,600 cubic feet of storage per acre, for all sites of 10 or more acres.

• *Numerical Pollutant Removal Requirements*

EPA considered options that would contain numerical requirements for the removal of specific pollutants from construction site runoff. EPA initially considered targeting a variety of pollutants including sediment, TSS, turbidity, nutrients, metals and other priority pollutants. EPA considered a regulatory option that would establish numerical removal criteria for sediment, or an associated indicator parameter such as total suspended solids (TSS), suspended sediment concentration, settleable solids, or turbidity. This option could be expressed as either a percent removal through sediment controls (such as sediment basins or traps), or as a total site reduction (incorporating consideration of sheet flow and diffuse runoff in addition to discrete conveyances). However, EPA did not consider this approach to be a viable regulatory option due to several factors. The stochastic nature of rainfall and runoff makes verification of the design standards difficult. In some cases, the nature of local rainfall and runoff characteristics make it difficult to even design BMPs to a specified performance level. In addition, site-specific soil conditions greatly influence the amount of sediment mobilized during runoff events, and the soil settling characteristics greatly influence the performance of sediment controls. Designing an entire suite of erosion and sediment controls for a site to perform to a specified level would likely require the use of a computer model, which could add significant costs with little assurance of increased effectiveness. Similarly, monitoring to verify attainment of numerical requirements can also be very difficult (see "Discharge Monitoring," below) with little demonstrated benefits. As a result, EPA did not consider numeric pollutant control requirements a viable option.

In addition to establishing numerical requirements for the control of sediment, EPA preliminarily considered establishing requirements for removing fine-grained and slowly-or non-settleable particles contained in construction-site runoff (such as turbidity). This option would likely have relied primarily on chemical treatment of soils or construction site runoff using polymers or coagulants such as alum in order to prevent the non-settleable fractions of solids from being transported off-site. EPA did not pursue this option due to the concern over possible adverse environmental effects of widespread usage of chemical or polymer treatment of soils and, therefore, does not present costs, pollutant removals, or economic impacts associated with such an option. However, EPA recognizes that at some sites use of chemical treatment may be appropriate based on a site-specific determination. The Agency solicits comment and data on the possible long-term environmental effects associated with this option.

EPA also evaluated the inclusion of separate requirements for controlling priority toxic pollutants, pesticides and pathogens in construction site runoff. If these pollutants are present as a result of construction activities themselves, the most appropriate means of control is typically through the use of source control and pollution prevention BMPs, which are already addressed in the existing NPDES regulations through the MS4 permit requirements. The Agency has been unable to identify any additional BMPs that are technically and economically feasible for use at construction sites that would remove these pollutants once they are in the water column. Therefore EPA does not present costs, pollutant removals, or economic impacts associated with such a separate option. Hence, EPA proposes to control the discharge of any such pollutants that may be associated with construction activity only to the extent that control of TSS will also control these pollutants. EPA is, however, planning to conduct additional sampling activities to evaluate the frequency of occurrence and levels of these pollutants and their sources in construction site runoff for the final rule. EPA solicits data and comments on the frequency of occurrence and levels of pollutants found in construction site runoff, as well as BMPs that can cost-effectively remove these pollutants from runoff when present.

• *Discharge Monitoring*

EPA considered the inclusion of monitoring requirements for evaluating the effectiveness of erosion and sediment controls. Monitoring of storm water discharges from construction sites could be used to evaluate the effectiveness of individual sediment controls (such as sediment basins), or monitoring the receiving water above and below construction sites could be used to monitor the effects of an entire site on ambient water quality. Monitoring requirements could be incorporated with any of the previously discussed regulatory options considered. Since EPA's preferred approach for addressing construction site storm water does not rely on the performance of individual sediment controls but rather on the combined performance of a suite of erosion and sediment controls, monitoring the effectiveness of individual controls is not appropriate. Monitoring the effectiveness of the overall erosion and sediment control requirements specified in today's proposal would be very difficult at the majority of construction

sites. In order to demonstrate that the erosion and sediment control provisions at the site are achieving a stated overall percent reduction in sediment discharge would likely require monitoring of every discharge point on the site, or monitoring the receiving water above and below the construction site. The high degree of variability in site parameters, regional and site-specific rainfall, and erosion and sediment control effectiveness would, in all likelihood, make specification of standard storm water monitoring requirements impractical for a national regulation. The constantly-changing state of construction sites due to the action of construction equipment would present significant challenges in terms of monitoring equipment set-up and maintenance. The stochastic nature of storm events would likely require a dedicated staffing effort on the part of the construction site operator in order to ensure preparedness of the sampling equipment for capturing runoff events. In addition, many sites discharge to an existing storm drain system, making monitoring of the receiving water infeasible. All of these factors would add significant expense to the construction process, with little or no added assurance in the effectiveness of control measures or expected environmental benefits. As a result, EPA is not including discharge monitoring with today's proposal. Permitting authorities may include discharge monitoring requirements in permits, where it may be practical to specify sampling and monitoring procedures that are appropriate for local conditions.

2. Overview of Regulatory Options: Certification and Inspection

During the Agency's outreach activities, EPA received many comments that an effluent guideline was unnecessary for sites covered by the NPDES Phase I storm water regulations, and untimely for sites that would be covered by the Phase II requirements. These commenters believed that the erosion and sediment control requirements currently being established through best professional judgement by the permitting authorities are appropriate in that they can be more effectively tailored to regional and local conditions and respect traditional State and local authority over land use management. Some of the commenters stated, however, that implementation of these State and local requirements is not uniform. These commenters expressed concern that State and local government resources are insufficient to provide compliance monitoring on a timely basis, particularly where inspections by government officials are the primary mechanism for ensuring that controls are installed and maintained. As a result, according to this view, the effectiveness of the program hinges on the amount of attention and oversight provided by the operator, and the knowledge and training that the operator has received.

As a result of these comments, EPA considered an option that would not establish ELGs at this time, but would rather require site inspection, maintenance and reporting by site owners and operators in order to improve confidence in the implementation and performance of construction site erosion and sediment controls. This option would include a maintenance record of site activities, including certification that plans required by the permit meet all erosion and sediment control requirements, certification that inspection, stabilization and maintenance requirements have been satisfied, and certification by a qualified professional that BMPs have been adequately designed, sized and installed. This option would also include a requirement that the operator or designated agent conduct regular inspections to ensure that erosion and sediment control BMPs are maintained in working order. The certification and inspection forms would be retained on the site, and made available to the permitting authority upon request. (See section XVIII of today's document for more information on compliance paperwork and implementation.)

EPA developed this option as a mechanism that might improve implementation of existing requirements. During Agency outreach conducted in advance of today's proposal, some small entity representatives commented that the problem with existing erosion and sediment control requirements is not the lack of standards, but rather the lack of adequate implementation and enforcement, including education, bid solicitation and evaluation, proper design, installation, and maintenance of BMPs, and inspection. One small entity representative cited a recent article,[6] which found that contractors are not following good installation and maintenance practices, and recommended more inspection and education be instituted to remedy the problems, instead of additional substantive regulatory requirements.

[6] Robert G. Paterson, "Construction Practices: The Good, The Bad and the Ugly." Article no. 60 in *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City, MD, 2000. Available at http://www.stormwatercenter.net.

EPA believes that one way to implement this recommendation is by increasing site accountability for implementation to ensure that corrective steps are taken as appropriate to ensure that practices perform as designed. For example, inspection of perimeter silt fences can identify sections in need of repair or replacement to ensure sediment containment. Because this option is not linked to specific levels of performance, but applicable to any requirements that are established by the permit writer, EPA believes that it may be appropriate for sites between one and five acres as well as for sites of five acres or more. This option is proposed today for all sites of one acre or more as Option 1, and would amend the NPDES permit regulations at 40 CFR 122.44. See section X for a description of the options proposed. EPA also recognizes that this option may impose disproportionate costs on small operators who may have to rely on outside consultants to perform certifications and inspections. One way to reduce overall burden, including burden on small operators, while covering the majority of disturbed acreage would be to limit the scope of this option to sites of 5 acres or more. This would establish certification and inspection requirements for 80 percent of the disturbed acres. EPA thus solicits comment on limiting the scope of this option to sites of five acres and above. Under this approach, sites below 5 acres would continue to be governed by certification and/or inspection requirements based on the BPJ of the permitting authority.

3. Overview of Regulatory Options: Continued Reliance on State and Local ESC Programs

EPA is also proposing an option under which no additional national regulations would be established at this time. Rather, EPA would continue to rely on existing State and local programs to establish appropriate sediment and erosion control requirements for permitted construction sites, either on a BPJ basis or in accordance with applicable regulations, ordinances, land use plans, etc. Under this option, EPA could provide additional support for training and education of construction and development operators, municipalities and State regulators, in order to improve the effectiveness of existing programs. This would build on the existing regulatory framework by preserving State and local flexibility to tailor specific requirements to regional and local conditions while at the same time benefitting from enhanced technical

assistance and the latest information about emerging ESC technologies and their effectiveness. This option is being proposed as Option 3.

4. Overview of Regulatory Options Considered: Long-Term Storm Water Management

EPA evaluated several regulatory options for control of long-term storm water discharges from development projects. These options are designed to control the discharge of sediment, storm water and other pollutants from sites after construction is completed. EPA specifically considered numerical design standards for the removal of specific pollutants (e.g., 80 percent TSS removal), limitations on post-development flows (e.g., maintain peak flows at pre-development levels), and BMPs to address thermal loadings to sensitive cold water streams. EPA is not proposing any of these options today. The choice of such controls, whether at a specific site or through regional storm water management infrastructure, has historically been left to State and local governments. These governments use a variety of regulatory and non-regulatory programs (such as land use planning) to address post-construction storm water flows in order to protect infrastructure and achieve local resource goals. A summary of existing State programs is included in the rulemaking record. Some States and municipalities rely on traditional approaches, such as retention ponds and infiltration basins. Other States and municipalities are pursuing approaches that will encourage regional planning, lower impact development, and other progressive programs to reduce not only the pollutant run-off from the site, but to protect receiving streams from the intensity of runoff that has accompanied urbanization. Many of these approaches do not lend themselves to uniform standards, but require integration with land use decisions and site design. EPA supports these approaches, and does not want to limit the flexibility that can be afforded at the local level while advances are being made. Moreover, the options EPA explored for a national ELG would have been very expensive if calculated on a total industry cost basis. Given the variety of approaches being attempted across the country and the expense of imposing uniform post-construction controls, EPA considers it inappropriate to propose an ELG for long-term storm water management at this time. Instead, EPA has decided to confine the proposed ELG to controls on discharge of pollutants associated with construction activity during the active construction phase, and to maintain the traditional reliance on State and local programs to control long-term storm water management. At the same time, EPA is concerned that States and municipalities be provided the tools to assess the variety of practices that are available today for long-term storm water management. Much of the technical data that EPA collected in evaluating these options will be made available in the rulemaking record.

X. Determination of Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT), Best Available Technology Economically Achievable (BAT), and New Source Performance Standards (NSPS)

As discussed in section III.D of today's document, in the guidelines for an industry category, EPA defines BPT effluent limits for conventional, toxic (priority), and non-conventional pollutants for direct discharging facilities. For the BPT cost-reasonableness assessment in today's proposal, EPA used the total pounds of TSS removed.

A. Rationale for Selected BPT Option

EPA estimates that construction sites annually discharge 80 million tons of TSS into the surface waters of the United States. As a result of the quantity of pollutants currently discharged directly to the nation's waters and the adverse environmental effects of these discharges (see section VIII.B of today's document), EPA determined that there may be a need for BPT regulation for the construction and development category.

At the same time, EPA recognizes that many States are examining the permit requirements they are establishing in light of their experience with the storm water program to date. EPA's estimates of pollutant discharges today are significantly lower than estimates at the time EPA issued the CGP. EPA is therefore co-proposing not to establish BPT requirements for the C&D category, but to allow and encourage fuller implementation of the current storm water program. This co-proposal takes two forms, one in which EPA essentially codifies the inspection and certification provisions discussed in section IX (hereinafter called Option 1), and one in which EPA does not amend the national storm water regulations at this time, but instead continues to rely on BPJ requirements tailored to regional and local conditions as determined by the permitting authority (hereinafter called Option 3).

As one option, the Agency is proposing codification of the CGP with inspection and certification as the basis for BPT (Option 2). EPA's decision to co-propose BPT limitations based on this option reflects the following primary factors: (1) The degree of effluent reductions attainable, (2) the total cost of the proposed option in relation to the effluent reductions achieved, and (3) the maturity of the NPDES program as it pertains to construction activity at sites of 5 acres or greater. EPA estimates that this option will reduce pollutant discharges to waters of the United States by 22 billion pounds per year at a cost of $505 million. EPA believes this option does not create unacceptable deleterious non-water quality environmental impacts.

EPA has not identified a basis for formulating different BPT limitations based on facility age, process or other engineering factors. The most pertinent factors for establishing the limitations are costs of the controls, the level of effluent reduction benefits obtainable, and the current state of the NPDES program.

As described in section IX of today's document, EPA is proposing this option for sites of five acres or more. EPA is not proposing to establish effluent limitation guidelines for sites of less than five acres at this time for the reasons described in section IX.

EPA is also considering the option (discussed in section IX) that would codify the CGP without adding the inspection and certification requirements. Although EPA believes that inspection and certification requirements will help ensure the proper design, installation, and maintenance of erosion and sediment controls, EPA recognizes that including specific certification and inspection requirements in national regulations is not the only way to accomplish this objective. EPA could instead leave the establishment of such requirements to the BPJ of the permitting authority, consistent with State and local program requirements. Including specific certification and inspection requirements in co-proposed Option 2 accounts for $65 million per year of the $505 million per year cost of this option. EPA is interested in minimizing recordkeeping and reporting burdens to the extent that substantive performance is not jeopardized. EPA solicits comments on less costly means of ensuring the performance of erosion and sediment controls and the merits of leaving the establishment of specific certification and inspection requirements to the BPJ of the permitting authority. EPA solicits comment on the option of codifying the CGP without adding specific national

certification and inspection requirements. Under this option, §§ 450.21(f) and (g) would be removed from the proposed rule language, except the first sentence of § 450.21(g)(1) which would be retained.

B. BCT Determination

1. July 9, 1986 BCT Methodology

The BCT methodology, promulgated in 1986 (51 FR 24974), discusses the Agency's consideration of costs in establishing BCT effluent limitation guidelines. EPA evaluates the reasonableness of BCT candidate technologies (those that are technologically feasible) by applying a two-part cost test:

(1) The publicly-owned treatment works (POTW) test; and

(2) The industry cost-effectiveness test.

In the POTW test, EPA calculates the cost per pound of conventional pollutant removed by industrial dischargers in upgrading from BPT to a BCT candidate technology and then compares this cost to the cost per pound of conventional pollutant removed in upgrading POTWs from secondary treatment. The upgrade cost to industry must be less than the POTW benchmark of $0.25 per pound (in 1976 dollars).

In the industry cost-effectiveness test, the ratio of the incremental BPT to BCT cost divided by the BPT cost for the industry must be less than 1.29 (i.e., the cost increase must be less than 29 percent).

2. Consideration of BCT Option

For today's proposed rule, EPA considered whether or not to establish BCT effluent limitation guidelines for C&D sites that would attain incremental levels of effluent reduction beyond BPT for TSS. EPA was not able to identify a technically feasible, discrete addition to the BPT technology that would achieve additional TSS reductions and would be applicable nationally. For construction site erosion control, additional conventional pollutant removals would require the use of chemical treatments such as polyacrylamide (PAM) or alum. As described in section IX.C of today's document, the Agency recognizes that these treatments are used in some parts of the country, but has insufficient information about the environmental effects of the treatments to recommend requiring their use nationwide. Therefore, EPA did not apply the BCT Cost Tests and is co-proposing that BCT be set equivalent to BPT limitations (i.e., Option 2).

C. BAT and NSPS

EPA generally considers the following factors in establishing the best available technology economically achievable (BAT) level of control: The age of process equipment and facilities, the processes employed, process changes, the engineering aspects of applying various types of control techniques, the costs of applying the control technology, economic impacts imposed by the regulation, non-water quality environmental impacts such as energy requirements, air pollution and solid waste generation, and other such factors as the Administrator deems appropriate (section 304(b)(2)(B) of the Act). In general, the BAT technology level represents the best existing economically achievable performance among dischargers with shared characteristics. In making the determination about economic achievability, the Agency takes into consideration factors such as plant closures and product line closures. Where existing wastewater treatment performance is uniformly inadequate, BAT technology may be transferred from a different subcategory or industrial category. BAT may also include process changes or internal plant controls which are not common industry practice.

EPA considered the same option for BAT as discussed under BCT. The Agency is unaware of any additional technically feasible and economically achievable technologies for the removal of toxics (i.e., priority metals and organic chemicals) and non-conventional pollutants under BAT beyond those considered for BPT. As discussed in section IX.C of today's document, EPA initially considered the use of chemical treatment of soils or the addition of polymers (such as PAM) or coagulants for the removal of toxics and non-conventional pollutants. However, due to the concern over the unknown environmental effects of widespread usage of such treatment, EPA did not give this option further consideration. EPA is co-proposing BAT limitations equivalent to BPT (Option 2).

When developing NSPS, EPA generally considers that new facilities have the opportunity to incorporate the best available demonstrated technologies including process changes, in-plant controls, pollution prevention, and end-of-pipe treatment technologies.

The NSPS co-proposed in today's rule would apply to new sources as defined in § 450.11. EPA proposes to define "new source" for purposes of part 450 as any source of storm water discharge associated with construction activity that results in the disturbance of at least five acres total land area that itself will produce an industrial source from which there may be a discharge of pollutants regulated by some other new source performance standard elsewhere under subchapter N. (All new source performance standards promulgated by EPA for categories of point sources are codified in subchapter N.)

The definition of new source proposed today for purposes of part 450 would mean that the land-disturbing activity associated with constructing a particular facility would not itself constitute a "new source" unless the results of that construction would yield a "new source" regulated by other new source performance standards. For example, construction activity that is intended to build a new pharmaceutical plant covered by 40 CFR 439.15 would be subject to new source performance standards under § 450.24.

EPA also seeks comment on whether no sources associated with C&D activity should be deemed "new sources." EPA may decline to establish NSPS on the grounds that construction activity itself is outside the scope of those activities intended to be covered by CWA section 306. ("The term 'new source' means any source, *the construction of which* is commenced * * *" 33 U.S.C. 1316(a)(2)(emphasis added)). Because EPA has co-proposed to set NSPS equivalent to BPT, the Agency expects that this would not result in any substantive increase or decrease in the limitations imposed on any C&D activity.

EPA's proposed approach to defining "new sources" is based largely on the structure of the CWA. Under the CWA, a source may not be a "new source" under section 306(a)(3) unless there is or may be a discharge of pollutants from the constructed facility. A discharge of pollutants means an addition of any pollutant to navigable waters from any point source, i.e., any discernible, confined and discrete conveyance such as a pipe, ditch or channel. See CWA section 502(12) & (14). Section 306(b) of the CWA itself includes a list of industries for which EPA was directed to address with NSPS. EPA proposes to treat all sources from which there may be a discharge associated with construction activity disturbing five acres or greater that will result in a "new source" as "new sources" themselves.

There may be situations when a newly-constructed direct discharging point source would fall within an industrial category or subcategory for which EPA has not promulgated NSPS; In that case, the discharge associated

with the construction activity would be subject to BPT limitations outlined in § 450.21. Substantively, these limitations are identical to those imposed on "new sources" under this proposed rule.

EPA is interested in any comments on these, or other possible definitions of new source in this rule and is especially interested in comments regarding EPA's legal authority to take either of these approaches, the environmental benefits of these approaches and the potential implications these approaches may have on administration of the NPDES permit program.

D. Summary of Provisions in Today's Proposed Rule

The provisions in today's proposed rule are discussed programmatically rather than in the order of the numbered options.

1. General Provisions and SWPPP Preparation

Option 2 in today's proposal includes a number of specific provisions for preparation of Storm Water Pollution Prevention Plans (SWPPPs) based principally on EPA's current Construction General Permit (CGP). EPA is also proposing some additional provisions for inclusion in SWPPPs.

Options 1 and 3 do not include specific provisions for preparation of a SWPPP. However, under these options sites would continue to be governed by existing permit requirements. All individual permits, EPA-issued general permits, and most State-issued general permits for discharges associated with construction activity five acres of greater require the preparation of a SWPPP or similar pollution prevention documentation.

The CGP requires owners and operators of construction sites subject to regulation to prepare a SWPPP that, among other things, describes the BMPs to be selected to control runoff during the land-disturbing phase (erosion and sediment controls). While the SWPPP terminology is used in EPA-issued CGPs, States need not use the SWPPP terminology. Instead, States may require alternate documents that are equivalent to SWPPPs. Examples include erosion and sediment control plans, storm water management plans, or other documents. EPA has conducted an evaluation of State-level erosion and sediment control regulations, and found that the majority of States include provisions equivalent to those contained in the EPA CGPs. As a result, the requirements co-proposed under Option 2 today can be incorporated into SWPPPs, or alternate documents that are equivalent to a SWPPP, as long as these documents address all of the provisions contained in today's proposal.

The requirements co-proposed today do not preclude permitting authorities and State, County and Municipal erosion and sediment control regulations or ordinances from including additional or more stringent requirements, nor do they replace existing requirements that are more stringent.

Section 450.21(d) contains the requirements for preparing a SWPPP under Option 2. Explanations are provided below for selected provisions.

- Section 450.21(d)(1). *Narrative description of the construction activity.* Although not an explicit requirement, EPA presumes that any individual activity on the site that will result in a disturbance of more than 1,000 square feet of land will be treated as a "significant" disturbance of soils and will be described in the SWPPP.
- Section 450.21(d)(2). *General location map and site map.* In most cases, a site drawing prepared along with the erosion and sediment control plan is appropriate. The site map shall be of sufficient scale and detail to allow easy identification of individual erosion and sediment controls and storm water BMPs, as well as delineation of drainage pathways. In many jurisdictions, local agencies specify a map scale for preparation of site drawings.
- Section 450.21(d)(3). *Description of available data on soils present at the site.* This type of information may be obtained from soil surveys conducted during the initial stages of project formulation, which may be needed for evaluating the engineering properties of soils. Information of this type might also be collected during initial investigations of a site, commonly referred to by the industry as "due diligence" procedures or a "Phase I" or "Phase II" environmental site assessment.[7]
- Section 450.21(d)(4). *Description of BMPs to be used to control pollutants in storm water discharges during construction.* The operator may reference a State erosion and sediment control design manual used to design BMPs as an abbreviated method for a fuller description of the BMPs in the SWPPP. Such references should cite specific BMP references and/or specifications in the manual.
- Section 450.21(d)(5). *Description of the general timing (or sequence) in relation to the construction schedule when each BMP is to be implemented.* Although approximate dates are useful, they are not necessary. General descriptions are acceptable. For example, one might describe an installation of a BMP as follows: "sediment basins will be installed prior to initial clearing and grubbing of the site."
- Section 450.21(d)(6). *Estimate of the pre-development and post-construction runoff coefficients of the site.* Estimates of runoff coefficients may be determined by using a number of readily available resources, including models such as "Urban Hydrology for Small Watersheds, Technical Release 55 (TR–55)" and documents such as "Hydrology, Section 4, National Engineering Handbook (NEH–4)," both published by USDA/Natural Resources Conservation Service (NRCS). In addition, there are a number of commercial software packages that may also be used to estimate these parameters.
- Section 450.21(d)(8). *Delineation of SWPPP implementation responsibilities.* The SWPPP must describe who is responsible for implementation of the controls described in the SWPPP.
- Section 450.21(d)(9). *Any existing data that describe the storm water runoff characteristics of the site.* Include any existing data that describe the quality of any discharges of storm water from the site. This does not require the permittee to collect additional data.

It is important to note that the above requirements for SWPPP preparation are in addition to any requirements contained in other Federal, State or local regulations. Permittees should always consult permit authorities to obtain all requirements related to SWPPP preparation. In addition, § 450.21(e) would require periodic updating of the SWPPP to address changes in activities that may require updating of the erosion and sediment control provisions for the site. Examples where updates may be needed include significant changes in the construction schedule or changes in the nature of construction activities. If periodic inspections indicate that the selected erosion and sediment controls are not effective in controlling pollutant discharges from the site, the revision of the SWPPP may be necessary. It is the responsibility of the permittee to keep the SWPPP current.

[7] The phases referred to in this instance describes a step in an environmental site assessment (ESA) process, not the NPDES "Phase I" of "Phase II" storm water regulations. ASTM International (formerly known as the American Society for Testing and Materials) has published recommended ESA procedures as standard no. E1527–96. http://www.astm.org

2. Design and Installation of Erosion and Sediment Controls

Under all three options, permits would require, at a minimum, compliance with any applicable State and local erosion and sediment control requirements. Under Option 2, the selection, design and implementation of these controls would need to also comply with the national effluent guidelines in 40 CFR 450.21. Under Options 1 and 3, the selection, design and implementation of these controls would be governed by BPJ-based permit conditions established by the permit authority and tailored to regional or local conditions. In practice, many of the same control technologies may be used under all three options, though the design and performance could vary significantly in some locations.

The erosion and sediment control provisions of Option 2 rely on implementation of a range of BMPs, as well as a design-based standard for sediment basins. This standard is different from many traditional effluent guidelines in that it does not establish end-of-pipe discharge limitations or performance standards for storm water runoff from construction sites, but instead establishes minimum criteria for erosion and sediment control selection, design, installation and maintenance. The design standard is based primarily on minimizing sediment generation and transport through the use of effective erosion controls, and secondly on controlling sediment discharge through the use of effective sediment controls. Due to the high degree of variability in site parameters, regional and site-specific rainfall, and erosion and sediment control effectiveness, Option 2 does not contain numerical discharge standards or discharge monitoring requirements. Instead, this option relies on adherence to established erosion and sediment control principles and demonstration of effective design, installation and maintenance through regular inspection and certification.

Although Option 2 does not contain monitoring provisions, permitting authorities may require monitoring of construction site runoff or receiving waters to gauge performance. Examples of indicator parameters that may be evaluated in order to evaluate the quality of storm water discharged from construction sites include TSS, turbidity, settleable solids, and suspended sediment concentration. (EPA-approved analytical test methods for some of these parameters are listed in 40 CFR part 136.) In addition, permitting authorities may also utilize numerical models to evaluate erosion and sediment control efficiency and to evaluate sediment generation and delivery from construction sites. Examples include empirical models such as the Revised Universal Soil Loss Equation (RUSLE) or process-based models such as SEDCAD and SEDIMOT II.[8]

Under Option 2, construction site owners and operators would be required to consider the use of a range of erosion and sediment control BMPs when preparing SWPPPs for construction sites. EPA's preferred approach is to first limit sediment generation and transport through the use of effective site planning and erosion controls, and secondly control sediment discharges through the use of effective sediment controls. In addition, § 450.21(c) would require implementation of pollution prevention practices to prevent contamination of storm water runoff with construction materials and litter and debris.

Section 450.21(a) would require that construction site owners and operators include descriptions of general erosion and sediment controls and BMPs in SWPPPs to retain sediment on site (to the extent practicable), and to provide interim and permanent stabilization. Stabilization measures may include establishment of temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, and protection of trees and mature vegetation. This section also requires the SWPPP to contain a schedule indicating when practices will be implemented. EPA recommends that all controls be properly selected and installed in accordance with sound engineering practices and, when feasible, manufacturer's specifications.

In Option 2, EPA is requiring that owners and operators implement sediment controls for all drainage areas of 5 or more acres. For drainage areas of between 5 and 10 acres, smaller sediment basins or sediment traps shall be used where attainable. For drainage areas of 10 or more acres, sediment basins or equivalent control measures shall be installed where attainable. Where neither a sediment basin or equivalent control is attainable, silt fences, vegetative buffer strips or equivalent sediment controls are required. Runoff from undisturbed site areas that is diverted around disturbed areas can be ignored when designing sediment controls. Where attainable, sediment basins shall be designed to provide storage for a 2 year, 24-hour storm, or alternatively, 3,600 cubic feet of storage volume per acre drained. The basin sizing is based on the area of the drainage that will have vegetation removed and soils disturbed (i.e., if the drainage area is 15 acres, but only 13 acres of this area will have vegetation removed and soils disturbed during the course of the project and the remaining 2 acres will remain vegetated and is directed around both the disturbed area and the sediment basin, then the permanent storage volume can be sized based on 13 acres). EPA recommends that sediment control outlets be designed to provide a detention time at the design capacity of at least 6 hours. In addition, permit authorities may require that the basins be designed to pass larger runoff events safely, and may require the use of an emergency spillway, pursuant to state and/or local authority.

EPA encourages permittees to utilize improved sediment basin designs that incorporate features such as baffles and outlet structures such as rock or fabric filters surrounding risers, siphoning outlets, and using surface skimmers and floating weirs. The use of these practices may significantly improve the performance of sediment basins in certain cases. In addition, all basins should be designed by a qualified engineer and local regulations regarding impoundment design should be consulted.

Proposed § 450.21(h) would require site owners and operators to provide temporary and/or permanent stabilization of exposed soil areas on construction sites. Exposed soil areas and slopes must be stabilized as soon as practicable, and in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. Where construction activity has temporarily ceased on a portion of the site and earth-disturbing activities will be resumed within 21 days, stabilization is not required on that portion of the site. Time limits for stabilization may be extended where compliance is impractical due to snow cover, frozen soil, or other factors. Temporary or permanent erosion control measures include planting of vegetation, sodding, mulches, bonded fiber matrices, binders and tackifiers, polymers, and rolled

[8] "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)." K.G. Renard, G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder. United Stetes Department of Agriculture, 1997.

Warner, R.C. and P.J. Schwab, 1998. "SEDCAD 4 for Windows 95 & NT: Design Manual and User's Guide." Civil Software Design, Ames, IA.

Wilson, B.N., B.J. Barfield, A.D. Ward, and I.D. Moore. 1984. "A Hydrology and Sedimentology Watershed Model, Part I: Operational Format and Hydrologic Component." Transactions of the American Society of Agricultural Engineers 27(5):1370–1377.

erosion control products. Exceptions are provided for low rainfall areas and where stabilization is temporarily impracticable.

3. Inspection and Certification Provisions

Under all three options, permits would generally specify inspection and/or other requirements to ensure compliance. Under Option 3, these requirements would continue to be based on State and local ESC programs and the BPJ of the permitting authority. Both Options 1 and 2 would require a variety of site erosion and sediment control inspection and certification requirements, including inspections every 14 days and a final site inspection and certification. The provisions in each option are roughly equivalent, although each would be codified differently in the regulations. Under Option 3, any inspection and certification requirements would be based on any applicable State and local ESC programs and the BPJ of the permitting authority.

In Option 1, part 122 would be amended to add conditions applicable to storm water permits for construction activity. Section 122.44(t)(1) would require a permittee (or designated agent) to maintain a site log book to track the implementation of erosion and sediment controls and other actions required by the permit. The analogous provision in Option 2 is at § 450.21(f). Any format for the site log book could be used, as long as the specific provisions listed in the regulation are addressed. EPA plans to provide guidance on a recommended format for the site log book at the time of promulgation if EPA ultimately promulgates inspection and certification requirements. EPA solicits comments on the log book format.

Option 1 would also amend § 122.44(i)(4) to exclude construction sites subject to ELGs from discharge monitoring requirements, for the reasons described in section IX of today's document. Permit authorities would retain discretion to set monitoring requirements for construction site discharges on a case-by-case basis.

Options 1 and 2 would also require periodic inspection and certification of various provisions. This is embodied in proposed § 122.44(t)(2) in Option 1, and §§ 450.21(f) and (g) under Option 2. The certification, either by the permittee or designated agent (as described below) would be an assurance by the certifying official that the various provisions concerning BMP design, installation and maintenance are occurring on a regular basis in order to assure effectiveness of the selected erosion and sediment controls. The permittee or designated agent would not be required to certify as to the performance of selected controls, but rather that the controls were designed and installed according to the provisions required in the permit and that regular maintenance activities are occurring. In some States and municipalities, similar inspection systems are already being employed, and EPA believes that these systems would generally be in conformance with Options 1 and 2. The Agency requests comment on whether the proposed inspection requirements are compatible with existing State and local ESC inspection systems.

EPA recommends that these inspections be conducted by a Certified Professional in Erosion and Sediment Control (CPESC),[9] licensed Professional Engineer (PE), or other qualified professional with training in erosion and sediment control principles and practices. However, since there will be a large number of inspections required to cover all construction sites nationally and there is only a limited number of certified professionals available, EPA is not requiring that these inspections be carried out by a licensed or certified professional. The individual conducting the inspections should have adequate training and a thorough understanding of the erosion and sediment control requirements for the site, as described in the SWPPP. EPA envisions that in most cases, and particularly for larger projects, the inspection and reporting requirements will be carried out by the same consulting firm(s) or prime contractor(s) that provided the initial site design, engineering drawings, SWPPP preparation, and construction supervision for that project. However, the permittee may make other arrangements to accomplish the inspection and reporting requirements, such as self-inspection and self-certification.

It is important to note that compliance with the proposed inspection and reporting requirements would be the responsibility of the permittee. Although a subcontractor, consultant or third-party certification firm may be employed by the permittee to conduct the actual inspections, any discrepancies or violations noted would be a violation of the site owner or operator's storm water permit and corrective measures would be the responsibility of the permittee. EPA would not hold subcontractors or consultants who are providing inspection and certification services to permittees responsible for permit violations. The site log book would be the official record of inspection and maintenance activities, and a copy should be maintained by the site owner or operator in the event of a change in the entity providing the inspection mechanism (for example, if a developer changes subcontractors following the completion of initial grading).

The site log is intended to serve multiple purposes. The first, and most important, is as a planning tool for the permittee and a means of tracking erosion and sediment control activities, including maintenance. The second is a tool for permitting authorities to gauge compliance with regulations and to aid enforcement activities. As such, it is in the best interest of all parties involved for the permittee to maintain a copy of the site log book and other documents required by the permit (e.g., a SWPPP) on-site, and to allow access to this information by the permitting authority. Since members of the public may also have an interest in the compliance related information documented in the site log book, EPA recommends that a copy be maintained in a public location (such as a library or courthouse), or that a copy be made available to the public upon request within a reasonable period.

4. Maintenance

In Option 2, construction site owners would be required to remove accumulated sediment from sediment traps and ponds when design capacity has been reduced by 50 percent.

XI. Methodology for Estimating Costs

In developing today's proposed rule, EPA has taken a model approach to estimating the costs of compliance.[10] Costs were estimated that are expected to be borne by two distinct entities: (1) Costs that are expected to be directly borne by the construction and development category for BMP installation and administrative functions and the consumers of the construction projects; (2) costs that are expected to be borne by permitting authorities for implementing the provisions of today's proposal. All costs presented are incremental over the costs already being borne by these entities due to existing Federal, State and local regulations governing erosion and sediment control.

[9] The CPESC training program is sponsored by the International Erosion Control Association (http://www.ieca.org) and the Soil and Water Conservation Society (http://www.swcs.org).

[10] A cost model identifies variables and uses equations to estimate costs. The model is used to estiamte costs before and after implementation of the proposed rule.

In estimating costs of today's proposal to the C&D category, EPA has categorized costs as capital costs and administrative costs. The following components were included in EPA's costing analysis: (1) Capital costs, including design, installation (including materials and labor), maintenance, profit and overhead; and (2) administrative costs, including SWPPP preparation, inspections, installation and maintenance certification, permit submission, and records retention. In developing cost estimates for permit authorities, EPA estimated administrative costs to revise general permits to incorporate the effluent guidelines requirements.

Using NRI and Census data, EPA estimates that the C&D category converts approximately 2.2 million acres of land from rural to urban use in the nation each year. This is based on NRI data for the years 1992 and 1997. Although the use of NRI data is likely to overestimate the amount of new acreage that is actually developed (as opposed to just being included in the new urban land use base), EPA still chose to utilize NRI data for the following reasons: (1) NRI data provides a consistent and comprehensive picture of broad land use changes for the United States; (2) NRI data is presented at the watershed scale, allowing subsequent evaluation of environmental impacts and benefits in a consistent manner; and (3) NRI data allows evaluation of recent as well as historical land use changes, facilitating the estimation of trends.

For all of the environmental and economic assessments prepared for today's proposal, EPA elected to use a single year's developed acreage as the basis for its estimations, and to present all cost data on an annual basis. To help establish what trends exist in new urbanizing areas, EPA evaluated published sources to define what an urbanized area contains in terms of various land uses, and used these land uses to apportion annual construction activity into different industries based on developed land area. The Agency formulated characteristics for four industries based on Census data: single-family housing construction, multi-family housing construction, manufacturing and industrial building construction, and commercial and institutional building construction. A breakdown of estimated construction acreage by sector can be found in Chapter four of the Development Document.

EPA's analysis indicates that between 1999 and 2000 there were approximately 42,000 acres of new urban road and highway construction in the U.S. (Highway Statistics 1999 and Highway Statistics 2000, Federal Highway Administration). This constitutes less than 2 percent of the total new developed acreage in the U.S. Because new road and highway construction is such a small percentage of annual development acreage, EPA did not conduct a separate analysis of costs of the proposed rule for highway, street, bridge and tunnel construction. EPA requests comment on this approach, as well as data on the costs of the proposed rule for highway, street, bridge, and tunnel construction and any special implementation challenges that may be found by this sector.

A. Costs to the Construction and Development Category

EPA used a model site approach to develop estimates of costs of the rule to the C&D category. Using the data on development trends within each industry as a starting point, EPA estimated a distribution of construction site sizes for each of the four industries based on census data and on data collected during the NPDES Phase II rulemaking. The Phase II rulemaking data identify distributions of site sizes within each industry based on construction permits issued in 14 urbanizing municipalities. From this data, EPA was able to develop the national distribution of construction activity by sector and size. Detailed results of this analysis can be found in Chapter four of the Development Document.

EPA developed a series of model construction sites for each of the size strata and identified erosion and sediment control practices required under current State CGP baseline conditions (i.e. compliance with current NPDES regulations). The Agency identified costs of these controls using unit cost references commonly used by the industry to estimate their construction costs for bids (R.S. Means Co., Construction Cost Manual, 2000) as well as data from the literature. EPA also added costs for design, O&M, as well as regional cost adjustments. EPA then applied O&M costs, design costs, and profit and overhead, using costs and frequencies based on standard industry practice. Administrative costs for activities such as permit application and records retention were also estimated. Following development of regulatory options, EPA estimated the increase in costs for erosion and sediment controls due to factors such as increased sizing (for BMPs such as sediment basins), increased frequency of application (such as temporary seeding and mulching), as well as increased administrative costs for factors such as inspection and SWPPP certification. By comparing these costs to the baseline costs, EPA was able to estimate the incremental costs of various regulatory options. (See Chapter 7 of the Development Document for a more detailed discussion of the construction control model.)

B. Costs to Permit Authorities

EPA identified additional administrative costs to permit authorities for incorporating the proposed requirements into appropriate general permits. EPA views the permit authorities (EPA regional offices and States) as the main implementors of effluent guidelines and NPDES regulations. The Agency expects that States will integrate the proposed requirements into their respective erosion and sediment control general permits. However, many States rely on local governments and quasi-governmental agencies (e.g., conservation districts) as partners in implementing their ESC programs. EPA acknowledges that the administrative costs it has estimated will likely be shared among a broader range of entities than just States. (See chapter 7 of the Development Document for a more detailed discussion of the administrative costs to permit authorities.)

In estimating the total costs to administer today's proposed effluent guidelines requirements, EPA has built on its earlier work related to the Phase II NPDES storm water rule ("Economic Analysis of the Final Phase II Storm Water Rule," EPA–833–R–99–002, October 1999) in order to estimate incremental costs of effluent guidelines implementation. EPA has also built on regulatory program development costs identified in earlier effluent guidelines (such as the proposed rule for Concentrated Animal Feeding Operations, 66 FR 2960, January 12, 2001) where they are similar in nature and scope. In estimating the baseline administrative costs, EPA has assumed 100 percent implementation of existing Phase I and II NPDES storm water regulations. Applications for permits for discharges of pollutants associated with construction activity disturbing at least one acre but less than five acres are not required before March 10, 2003. Hence, although these permits are not required under Federal regulations at this time, they will be when EPA takes final action on today's proposal in 2004.

XII. Economic Impact and Social Cost Analysis

A. Introduction

EPA's Economic Analysis (see "Supporting Documentation") describes the impacts of today's proposed rule in terms of firm closures, employment losses, and market changes, such as housing prices. In addition, the report provides information on the impacts of the proposal on sales and prices for residential construction. The initial regulatory flexibility analysis (IRFA) supports EPA's compliance with the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). The report also presents identified, quantified, and monetized benefits of the proposal.

Today's document includes related sections such as the cost-effectiveness analysis in section XIII, benefits analysis in section XVI, and benefit-cost analysis in section XVII. In their entirety, these sections comprise the economic analysis (referred to collectively as the "C&D economic analysis") for the proposed rule. EPA's Environmental Assessment provides the framework for the monetized benefits analysis. See the complete set of supporting documents for additional information on the environmental impacts, social costs, economic impact analysis, and benefit analyses.

The C&D economic analysis, covering subsectors that disturb land (NAICS 233 and 234), uses information from, and builds upon, the NPDES Phase II rule economic analysis (op.cit.). In addition to building upon the work completed for the Phase II rule, the C&D economic analysis expands the Phase II economic analysis with, among others, an environmental assessment, economic achievability analysis, barrier-to-entry analysis, and benefit-cost analysis. In addition to CWA requirements, EPA has followed OMB guidance on the preparation of the economic analyses for Federal regulations to comply with Executive Order 12866. See section XIX.D of today's document.

B. Description of Economic Activity

The construction sector is a major component of the United States economy as measured by the gross domestic product (GDP), a measure of the domestic output of goods and services produced in one year by the U.S. economy. The construction sector directly contributes about five percent to the GDP. Moreover, one indicator of the economic performance in this industry, housing starts, is also a "leading economic indicator," one of the indicators of overall economic performance for the U.S. economy. Several other economic indicators that originate in the C&D industry include construction spending, new home sales, and home ownership.

During most of the 1990s, the construction sector experienced a period of relative prosperity along with the overall economy. Although cyclical, the number of housing starts increased from about 1.2 million in 1990 to almost 1.6 million in 2000, with annual cycles during this period. (U.S. Census Bureau, "Current Construction Reports, Series C20—Housing Starts," 2000. *http://www.census.gov/const/www).* At the beginning of the 21st century, the economy has begun to slow relative to previous highs in the 1990s. The United States has been affected by global factors and events, that have led to temporarily reduced consumer spending, but the adverse impacts on the construction and development industry appear modest at this time. The Federal Reserve money market policies to keep interest rates low, particularly mortgage interest rates, have been a significant and positive force in light of the economic factors impacting the economy. The most recent data indicates consumer spending for new homes remains strong.

For the purposes of today's proposed rule, the Construction and Development Category is comprised of industries that disturb land. The category contains business establishments [11] that are involved in building, developing and general contracting (NAICS 233) as well as heavy construction (NAICS 234). As a starting point, Table XII–1 shows the number of business establishments in the C&D category in 1992 and 1997. Only a portion of these establishments would be covered by the proposed regulation, because some of these establishments are house remodelers and others build on sites with less than one acre of disturbed land each year. (The proposed rule would cover projects one acre or more under Option 1, and 5 acres or more under Option 2 . See section IV, Scope of Proposal, in today's document.)

Table XII–1 shows a sharp decline in the number of developers between 1992 and 1997. The decrease in the number of developers may have been a response to changes in tax laws and the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 (Public Law 101–73, August 9, 1989) and the 1993 implementing regulations. The objective of FIRREA and the implementing regulations was to correct events and policies that led to a high rate of bankruptcies in the thrift industry in the late 1980s. The regulations changed lending practices by financial institutions, requiring a higher equity position for most projects, with lower loan-to-value ratios, and more documentation from developers and builders. (Kone, "Land Development," op. cit.)

TABLE XII–1.—NUMBER OF EMPLOYER ESTABLISHMENTS IN CONSTRUCTION AND DEVELOPMENT INDUSTRIES, 1992 AND 1997

NAICS	Industry	1992 number	1997 number	Change (percent)
233, except 2331	Building, developing, and general contracting, except land development and sub-development.	168,407	191,101	13.5
2331	Land development and sub-development	15,338	8,185	−46.6
234	Heavy construction	37,180	42,557	14.5
235[a]	Special trade contracting	14,864	19,771	33.0
Total		235,789	261,617	11.0

[a] Includes NAICS 23593 (Excavation contractors) and 23594 (Wrecking and demolition contractors).
Sources: 1992 and 1997 Census of Construction; Economic Analysis.

[11] The Census Bureau uses the term "establishment" to mean a place of business. "Employer establishment" means an establishment with employees.

Building upon Table XII–1, Table XII–2 shows the number of establishments that could potentially be covered under the C&D proposed regulation. From the total of about 262,000 establishments in 1997, EPA subtracted about 62,400 establishments that are engaged in home remodeling, and would not be subject to the proposed regulations. This estimate is based upon a study by the Harvard University Joint Center for Housing Studies ("Remodeling Homes for Changing Households," 2001). The elimination of remodelers is based on the fact that remodeling and renovation activities generally disturb less than one acre of land, if any at all.

EPA also deducted 50,661 establishments that build one to four houses. Given an average lot size of about 0.3 acres per house, EPA assumes that a builder that builds between one and four houses per year is unlikely to disturb one acre or more in a given year. The estimate of the number of establishments building one to four houses was based upon a study and report by the Census Bureau ("Construction Sector Special Study Housing Starts Statistics," op.cit.). Some of the sites built upon by these establishments would be covered by NPDES storm water permits if they are located within a "common plan of development" (i.e., a subdivision) that is at or above the regulatory threshold. (This threshold is currently 5 acres under the Phase I rule, and will become 1 acre under the Phase II rule in 2003.) However, the Agency does not have information on the amount of houses that are built within subdivisions, rather than on discrete lots, by these establishments. EPA requests comment on its methodology for removing remodelers and firms that do not disturb more than one acre of land from the analysis.

Based upon these adjustments of the total number of establishments, EPA believes that about 150,000 establishments would be covered under Option 1. Although it is likely that fewer establishments would be covered under Option 2, EPA has not made adjustments to account for establishments that do not disturb more than five acres. The population of establishments that would be covered after the adjustments that EPA has made may also include subcontractors. Many, if not most of these establishments also would not be covered by the proposed rule, because they do not disturb land. However, the Agency has insufficient data to make any further adjustments to the population of developers and builders covered by the proposal. For example, no adjustments have been made to account for establishments in the non-residential construction or heavy construction industries that may disturb less than one acre of land. EPA solicits comment on the Agency's estimate of the number of establishments that would be covered under the proposal. For general discussion, EPA will refer to the 150,000 establishments as the covered population. As estimated from the data sources available, the actual estimate is 148,556 establishments. EPA requests comment and any other information available about the potentially covered population.

TABLE XII–2.—NUMBER OF ESTABLISHMENTS COVERED BY THE CONSTRUCTION AND DEVELOPMENT PROPOSED REGULATIONS

NAICS	Industry sector	Establishments	
		Number	Percent of total
2331	Land development and subdivision	8,185	5.5
23321	Single-family residential building construction	31,615	21.3
23322	Multi-family residential building construction	1,718	1.1
2333	Nonresidential construction	44,710	30.1
234	Heavy construction	42,557	28.7
235	Special trade contracting	19,771	13.3
Total		148,556	100.0

Source: Economic Analysis.

C. Method for Estimating Economic Impacts

EPA has conducted economic impact analyses to determine the economic achievability of each of the three co-proposed options. An important methodology used in the economic impact analysis is an assessment of how incremental costs would be shared by developers and home builders, home buyers, and society. This method is called "cost pass-through" analysis or CPT analysis. Details of this method may be found in Chapter 4 of the Economic Analysis.

The economic analysis for the C&D proposal also uses another method called partial equilibrium analysis that builds upon analytical models of the marketplace. These models are used to estimate the changes in market equilibrium that could occur as result of the proposed regulations. In theory, incremental compliance costs could shift the market supply curve, lowering the supply of construction projects in the market place. This would increase the market price and lower the quantity of output, i.e., construction projects. If the demand schedule remains unchanged, the new market equilibrium would result in higher costs for housing and lower quantity of output. The market analysis is an important methodology for estimating the impacts of the provision proposed in today's document. The economic analysis also reflects comments in the October 2001 final report from the Small Business Advocacy Review (SBAR) Panel submitted to the EPA Administrator as part of the requirements under SBREFA. EPA is making this report available along with today's C&D effluent guidelines proposal.

For the technology-based construction and development effluent guidelines, EPA is required under Title III of the Clean Water Act to make a determination about the available technologies for BPT, BCT, BAT, and NSPS. EPA is required by the Act to ensure that technologies selected as the basis for BAT are economically achievable. EPA uses a different economic test for NSPS, a "barrier to entry" test. This test is typically applied to new sources or projects to determine if the proposed regulation could pose a barrier to entry in terms of starting a new project or business. The Agency typically uses a methodology that analyzes the incremental compliance

costs of the rule in comparison to the total assets required to start a new project or business. If these costs are excessive, then a barrier to entry could be a problem for entrepreneurs considering new business opportunities in the C&D category.

EPA used several broad cost components to estimate the compliance costs in an engineering cost model (see the Technical Development Support Document): "hard" compliance costs and "soft" compliance costs. Hard costs are the incremental construction costs for controls such as sediment basins. Soft compliance costs are the incremental costs for planning, design, permits, and engineering and legal services. Detailed information on the compliance costs is provided in the Development Document.

EPA estimated the incremental compliance costs for the BMPs using an engineering cost model that takes account cost factors such as labor rates and material costs. In most of the economic analyses described below, however, EPA has used weighted average national costs obtained by multiplying the regionalized costs by the share of total projects estimated to take place within each region of the country.

EPA estimated both the incremental compliance costs and the economic impacts of each proposed regulatory option at the project, establishment, firm, and industry (national) level. The economic impact analysis considered impacts on both the firms in the C&D industry, and on consumers who purchase the homes, and buy or rent industrial buildings and commercial and office space. In the case of public works projects, such as roads, schools, and libraries, the economic impacts would accrue to the final consumers, who, in most circumstances, are the taxpaying residents of the community. The sections below describe each modeling effort in turn. Detailed information on the data, models, methods, and results of the economic impact analyses are available in the Economic Analysis.

1. Model Project Analysis

EPA estimated project-level costs and impacts for a series of model projects. The models establish the baseline economic and financial conditions for model projects and assess the significance of the change in cash flow that results from the incremental compliance costs. EPA used the model project analysis to indicate whether typical projects affected by the proposed regulations would be vulnerable to abandonment or closure. The Agency developed model projects for four industries: single family residential; multi-family residential; commercial & institutional building; and manufacturing & industrial building. The models also included various construction project site sizes: 1, 3, 7.5, 25, 70, and 200 acres. In total, EPA developed 24 different model projects (4 types of development or land uses, multiplied by 6 project sizes) and used these models to assess the impacts of the proposed regulations at the project level.

Each model project is assumed to be undertaken in its entirety by a single entity acting as both developer and builder. EPA recognizes that in practice there may be several parties with a financial investment and role in a particular land development and construction project. For example, on some projects a developer may acquire the land, conduct the initial engineering and site assessments, and obtain the necessary approvals. The land may then be sold to another developer or builder who will undertake the actual construction work. Projects are also frequently undertaken by a consortium of firms or individuals, through various types of limited liability partnerships (LLP). While it is important to acknowledge this variation, for modeling purposes EPA has simplified this aspect and assumed only a single entity is involved from beginning to end, referred to below as a "developer-builder." EPA requests comment about this economic modeling approach.

The model projects reflect the range of development type and project scale seen in actual industry practice. The model project characteristics were developed from the statistical data described in section V of today's document, information distilled from academic literature and industry publications, and information provided to EPA in meetings with industry representatives. The model projects account for all of the steps in a typical land development project.

Although EPA has developed regional compliance costs, there were insufficient data available to develop model projects reflective of specific geographic zones or real estate markets. For this reason, EPA applied weighted average national costs to these models. The Agency obtained some of the model project parameters from home builders and developers in the mid-west region, so to some extent the model projects may be more reflective of conditions in this general market area.

Land development and construction typically occurs in a series of stages or phases. The model projects developed by EPA incorporate assumptions concerning the costs and revenues incurred at each stage. EPA has modeled all of the projects to reflect three principal development stages:

(1) *Land acquisition.* The starting point is usually acquisition of a parcel of land deemed suitable for the nature and scale of development envisioned. The developer-builder puts together the necessary financing to purchase the parcel. When lenders are involved, they may require certain documentation, such as financial statements, tax returns, appraisals, proof of the developer's ability to obtain necessary zoning, evaluations of project location, assessments of the capacity of existing infrastructure, letters of intent from city/town to install infrastructure, environmental approvals, etc. To satisfy these needs, the developer may incur costs associated with compiling these data.

(2) *Land development.* The developer-builder obtains all necessary site approvals and prepares the site for the construction phase of the project. Costs incurred during this stage are divided among "soft" costs for architectural and engineering services, legal work, permits, fees, and testing, and "hard" costs such as land clearing, installing utilities and roads, and preparing foundations or pads. The result of this phase is a legally subdivided parcel with finished lots ready for construction.

(3) *Construction.* The developer-builder undertakes the actual construction of the housing units. A substantial portion of this work may be subcontracted out to specialty subcontractors (foundation, framing, roofing, plumbing, electrical, painting, etc.). Marketing a development generally begins prior to the start of this phase, hence the developer-builder may also incur some marketing costs at this time. Housing units may come under agreement at any time prior to, during, or after completion of construction. Marketing costs are part of the baseline costs. EPA determined that no incremental marketing costs would be imposed by today's proposed rule.

EPA developed estimates of the project-specific costs and revenues at each stage of project development in the baseline scenario. The result is a cash flow analysis of the costs and revenues associated with the project. The general approach used in establishing the baseline scenario is to assume normal returns on invested capital and normal operating profit margins to arrive at the sales price for the final product (for example, completed new single-family homes in a residential development).

EPA analyzed the impact of today's proposed rule by adding in the regulatory costs at the appropriate stage of the project life cycle. The regulatory cost impacts on the model projects were analyzed under two alternative assumptions concerning cost pass-through. In the first scenario, EPA assumed that the developer-builder can pass through all of the incremental compliance costs associated with meeting the proposed regulations to the final customer (e.g., the new home buyer, consumers of public transportation services). Under this scenario, all costs are assumed to be borne by the customer in the form of higher prices for completed construction. In the second approach, EPA assumed that the builder-developer can not pass through cost increases to the buyer and therefore realizes a reduced profit on the project. In general, EPA believes that builders do pass through regulatory costs to customers, and this is supported by the academic literature and industry publications. The analysis simulates the results under two extremes in which consumers or industry absorb all of the cost impacts.

EPA notes that under certain conditions developers might also attempt to pass regulatory costs back to land sellers. For example, in a depressed market builders may argue successfully that a regulatory cost increase would make a particular project unprofitable unless the land costs can be reduced. If the land seller is convinced that a residential subdivision project would not proceed, they may be willing to accept a lower price for raw land. The ability of developers to pass such costs back would likely depend on the sophistication of the land owner, their experience in land development projects, knowledge of the local real estate market, and, in particular, their understanding of the regulations and their likely cost. While evidence of cost pass-back to land owners exists for fixed and readily identifiable regulatory costs such as development impact fees, it is unclear whether a builder's claim that costs would be higher due to construction site control regulations would induce land owners to make concessions. EPA requests comment on the likely success of developers attempting to pass regulatory costs for incremental storm water controls back to land owners.

2. Model Firm Analysis

EPA analyzed the impacts of the regulations at the level of the firm by building financial models of representative construction firms. The models for residential construction firms are based on data from the special Census report on the homebuilding industry. This source provides the average value of construction, average employment, and average number of housing starts for firms in various housing start classes. Within each housing starts size class, EPA constructed balance sheets and income statements by scaling published Dun and Bradstreet (D&B) data presented for "median" firms ("1999—2000 Industry Norms and Key Business Ratios," Dun and Bradstreet, 2000).[12] The basic approach was to calculate the ratio of key components of the balance sheet and income statement to net sales, and then scale the value of these components to the size of the model firm. For the commercial and industrial building construction industries, EPA scaled the balance sheet and income statement elements according to differences between incomes for these C&D industries reported by the Census Bureau and median incomes reported among firms sampled by D&B. EPA analyzed one model firm for these industries since comparable data by starts size class were not available.

To determine the annual compliance costs incurred by model residential construction firms, EPA converted the costs per acre to costs per housing start using estimates of the average lot size for new home construction, and then multiplied these costs by the number of housing units started. EPA was then able to assess the impact of the annual compliance costs on key business ratios and other financial indicators. Specifically, EPA examined impacts on the following measures: (1) the Gross Profit, (2) Current Ratio, (3) Debt to Equity Ratio, and (4) Return on Net Worth. Industry publications cite these financial ratios as particularly relevant to the construction industry (Kone, "Land Development," op.cit.; M. Benshoof, "An Inside Look at Builders' Books," *Housing Economics*, National Association of Home Builders, Washington, DC, 2001). Two of the ratios examined are based on operating income (gross profit, return on net worth), and two are based on the balance sheet statement (current ratio, debt to equity). The impacts of the compliance costs were examined by calculating the values of each ratio with and without the compliance costs. For this analysis, EPA assumed zero cost pass-through, which is a worst-case scenario in terms of describing the potential economic impacts on this industry.

To determine the annual compliance costs incurred by commercial and industrial construction firms, EPA first divided the total estimated number of construction starts by the number of establishments to obtain the average number of starts per establishment. To estimate the average number of acres per start, the Agency reviewed industry cost data (R.S. Means, 2000. "Building Construction Cost Data, 58th Annual Edition," Kingston, MA) for representative projects. EPA estimated an average of three acres per start, and then used this average to calculate the average number of acres developed per establishment. The number of acres developed per establishment was then multiplied by the regulatory costs per acre to obtain the annual regulatory costs incurred per establishment. As noted above, EPA examined the impact of these costs by examining changes in financial ratios for the median-sized firm. To do this, EPA scaled the financial data for the median firm drawn from the D&B data to the Census median firm, using the median income from each source as the scaling factor. EPA requests comment on the extent to which basing the analysis on the median-sized firm will appropriately capture impacts on smaller or larger firms.

3. Housing Market Impacts

EPA also developed models to assess the potential impacts of the regulations on the national housing market. To analyze the impacts of compliance costs on housing affordability, EPA estimated the level of income that would be necessary to purchase the average priced new home without the proposed regulation, and the change in income needed to purchase the average priced new home under each of the proposed regulatory options. The Agency then used income distribution data to estimate the change in the number of households that would qualify to purchase the average priced new home under each of the regulatory options. In this way, EPA was able to determine the number of households that may be priced out of the new housing market, assuming that all prospective buyers were targeting the averaged priced new home. The results of this analysis may be found in the Economic Analysis.

4. Impacts on the National Economy

The market model generates an estimate of the change in the total value of construction produced by the industry, i.e., industry output. Two effects of the regulation are acting on the

[12] The D&B data are based on a sample of firms with response ratios that are greater for larger firms than for small firms.

market value of construction output. First, the cost of construction increases, leading to a price rise and an increase in market value of final projects. Second, the quantity of houses sold is reduced because of the higher price due to compliance costs. The net effect on market value may be either positive or negative, depending on whether the elasticity of demand for housing is less than or greater than 1. There are also secondary impacts in other markets, caused by the shift in consumer spending, necessitated by the increased housing costs, from other goods to housing.

As these changes pass through the economy, they generate shifts in production and employment. The U.S. Department of Commerce uses input-output techniques to derive "multipliers" which indicate, for a given change in one industry's output, how output and employment in the whole U.S. economy will respond. EPA has applied the multipliers from the Regional Input-Output Modeling System, version 2 (RIMS II) to the change in output estimated from the market model to estimate the impacts on national output and employment.

D. Results

1. Firm-Level Impacts

EPA has estimated the economic impacts of the proposal at the firm level by estimating the number of firm closures, the number of lost jobs, and the decrease in firms' profits. The economic impact analysis at the firm level assumes that none of the incremental costs would be passed through to the final consumer, *i.e.*, zero cost pass-through. The Agency used this assumption for the economic impact analysis, because it presents the worst-case scenario (*i.e.*, the largest impacts to the firm). However, EPA's review of the academic literature and its discussions with industry officials indicate that most, if not all costs, are passed through to the final consumer and are not absorbed by firms in the industry.

The firm is the responsible entity for the installation of ESC BMPs and is the entity responsible for managing financial and economic information. Moreover, the firm is responsible for maintaining and monitoring financial accounts. For the C&D category, most of the business establishments, as defined by the Census Bureau, are firms. A small number of establishments are entities within a larger firm. A small percentage of firms have multiple establishments and some firms are regional or national in scope.

Table XII–3 presents one economic indicator, firm closures, by regulatory options and by industry (*e.g.*, Multi-family Residential).

TABLE XII–3.—FIRM CLOSURES BY INDUSTRY FOR THE REGULATORY OPTIONS: ZERO COST PASS-THROUGH ASSUMPTION

(Number of firms, percent of total firms)

Option	Single-Family Residential (#/%)	Multi-family residential (#/%)	Commercial and institutional (#/%)	Manufacturing and industrial (#/%)
1. Self-inspection, certification, 1 acre or more	4/0.01	1/0.02	11/0.03	2/0.03
2. Codification, self-inspection, certification, 5 acres or more	13/0.02	3/0.07	43/0.11	7/0.09
3. No regulation	0/0	0/0	0/0	0/0

Source: Economic Analysis.

EPA also estimated the number of potential jobs that could be lost as a result of the proposal. Table XII–4 provides the number of potential job losses by option and by industry.

TABLE XII–4. JOB LOSSES BY INDUSTRY FOR THE REGULATORY OPTIONS: ZERO COST PASS-THROUGH ASSUMPTION

[Number of jobs, percent of jobs]

Option	Single-Family Residential (#/%)	Multi-Family Residential (#/%)	Commercial and Institutional (#/%)	Manufacturing and Industrial (#/%)
1. Self-inspection, certification; 1 acre or more	34/0.01	12/0.03	162/0.03	43/0.03
2. Codification, self-inspection, certification; 5 acres or more	145/0.04	61/0.17	604/0.11	133/0.09
3. No regulation	0/0	0/0	0/0	0/0

Source: Economic Analysis.

EPA also estimated potential decreases in firms' profits. These results are presented in Table XII–5 by regulatory options and by industry. The potential changes in profits are in the range of a decrease in profits of one percent or less.

TABLE XII–5.—CHANGES IN PROFITS BY INDUSTRY FOR THE REGULATORY OPTIONS: ZERO COST PASS-THROUGH ASSUMPTION

[Percent of profits]

Option	Single family (%)	Multi-family (%)	Commercial (%)	Industrial (%)
1. Self-inspection, certification; 1 acre or more	-0.23	-0.31	-0.17	-0.14
2. Codification, self-inspection, certification; 5 acres or more	-0.52	-0.95	-0.40	-0.32
3. No regulation	0	0	0	0

Source: Economic Analysis.

For additional information on EPA's analysis of the change in financial position, see Chapters 4 and 5 of the Economic Analysis for the methodology and analysis on estimating firm-level impacts.

2. Impacts on Governments

EPA has analyzed the impacts of today's proposed rule on government entities. This analysis includes both the cost to governments for compliance at government-owned construction project sites (construction-related) and government costs associated with implementation of storm water programs (administration costs). For construction-related costs EPA assumed that 100 percent of the incremental compliance costs that contractors incur at government-owned construction sites are passed through to the government. Under this assumption EPA estimates the following impacts:

- Under Option 1, EPA estimates that State and local governments would incur about $12 million in annual costs and the private sector would incur about $114 million in annual costs. Of the $12 million in annual costs to State and local governments, about $2 million would be incurred by small government entities, less than 50,000 population, and about $10 million annually would be incurred by large government entities, greater than 50,000 population.
- Under Option 2, about $50 million of annual incremental costs would accrue to State and local governments.
- Of the $50 million in costs accruing to State and local government agencies, about $5 million per year would be incurred by small government agencies, communities with less than 50,000 population, and about $45 million would accrue to large communities, those with more than 50,000 population.

A subsidy or other complementary financing of these projects with Federal or State grants or revolving funds could reduce the direct impact on local taxpayers.

For administration costs, the analysis is based upon two elements for construction storm water programs: (1) Incremental costs to establish or modify programs, and (2) incremental costs to implement the proposed options. Table XII–6 provides information on the costs to establish or modify construction storm water programs. The program elements to establish the proposed options may include, among other program needs, those needed to revise State general permits. In addition, the States, and to some extent local governments, may need to provide basic program administration, education, public hearings, and public notifications as appropriate. These incremental program elements may be in place and may not be needed by all States or local governments.

TABLE XII–6.—ANNUALIZED ONE-TIME INCREMENTAL COSTS TO STATE AND LOCAL GOVERNMENTS FOR ESTABLISHING OR MODIFYING CONSTRUCTION STORM WATER MANAGEMENT PROGRAMS

Program element	Total (year 2000 $ million)
General permit development	0.30
Program administration	0.15
Education and information distribution	0.01
Public hearings	0.07
Quarterly public notification	5.80
Total	6.33

The detailed analysis is available in its entirety in the Economic Analysis.

3. Community-Level Impacts

EPA has estimated community-level impacts based upon the incremental costs of the proposal at the household level. The household impacts are those that would affect local communities in terms of the costs of housing. EPA's analysis considers the impacts on the price of housing based on the increase/decrease in the average price per house. Table XII–7 shows the change by selected option in the price per house.

TABLE XII–7.—CHANGE IN HOUSING PRICES FOR SELECTED OPTIONS

[100 Percent cost pass-through]

Option	Average price increase per house (year 2000 $)
1. Self-inspection, certification; 1 acre or more	18
2. Codification, self-inspection, certification; 5 acres or more	97
3. No regulation	0

Source: Economic Analysis.

The price increase per house that may be attributable to the proposal compared to the average price of a new house in the U.S., currently about $250,900, is very small. For these costs, the average monthly mortgage payment would increase by less than $5.00 per month.

4. Foreign Trade Impacts

As part of its economic analysis, EPA has evaluated the potential for changes in U.S. trade (imports, exports) of construction and development related goods and services. A significant component of the U.S. construction and development category operates internationally, and, in addition, numerous foreign firms that participate in this category also operate in the U.S. EPA judged that the potential for U.S. construction and development firms to be differentially affected by the proposed rule is negligible. The proposed rule will be implemented at the project level, not the firm level, and will affect projects within the U.S. only. All firms undertaking such projects, domestic or foreign, will be subject to the proposed rule. U.S. firms doing business outside the U.S. will not be differentially affected compared to foreign firms, nor will foreign firms doing business in the U.S.

The proposed rule could theoretically stimulate or depress demand for some construction-related goods. To the extent that the proposed rule acts to depress the overall construction market, demand for conventional construction-related products may decline. This decline may be offset by purchase of goods and services related to erosion and sediment control. Overall, EPA does not anticipate that any shifts in demand for such goods and services resulting from the proposal would have a significant implication for U.S. and foreign trade.

5. Impacts on New Facilities

EPA has conducted an analysis to assess the impacts on new firms that choose to enter the C&D category. This analysis uses a method called "barrier to entry" analysis. EPA examined the ratio of compliance costs to current and total assets to determine if new market entrants could find it more difficult to obtain construction loans to start a project than would existing firms. The Economic Analysis provides more complete information on the barrier to entry analysis. As discussed in more detail in the Economic Analysis, this methodology is conservative, because it doesn't account for the fact that a firm would typically be expected to finance 20 percent of the incremental compliance costs from their own financial resource to obtain the loan—not the full amount as assumed here. In addition, existing firms would more than likely need to meet the same requirement, and therefore would not obtain a competitive advantage over new entrants.

From the barrier to entry analysis, annual incremental compliance costs under Option 2 would comprise a maximum of 0.82 percent of the current assets for the Multi-Family Residential

Building Industry. For the Commercial and Institutional Building and Manufacturing and Industrial Building Industries, incremental compliance costs comprise less than 0.5 percent of current assets. For the Single Family Housing Industry, incremental costs comprise less than 0.2 percent of current assets. These costs are small as a percent of current assets. EPA believes that these costs pose no significant barrier to entry for potential businesses and projects.

6. Social Costs

EPA's analysis of social costs for Option 2 contains four costs components: (1) installation, design, and permitting costs; (2) O&M costs; (3) government costs; and (4) deadweight loss. When summed, these four cost categories comprise the total social costs for each option.

For Option 2 (codify CGP, self-inspection, certification, 5 acres or more), the total social costs of the proposal are about $505 million annually (year 2000 $). EPA has conducted a social cost analysis for each option. The Economic Analysis provides the complete social cost analysis for the proposed regulation.

7. Small Business Impacts

Section XIX.C of today's document provides EPA's SBREFA analysis. For purposes of assessing the economic impacts of today's rule on small entities, "small entity" is defined by SBA size standards for small businesses and RFA default definitions for small governmental jurisdictions. The small entities regulated by this proposed rule are small land developers, small residential construction firms, small commercial, institutional, industrial and manufacturing building firms, and small heavy construction firms.

Table XII–8 shows the impacts of the proposal using the one percent and three percent revenue tests, a method used by EPA to estimate the impacts on small businesses. The table presents the results for the proposed options.

TABLE XII–8.—SMALL BUSINESS ANALYSIS FOR REGULATORY OPTIONS, 1% AND 3% REVENUE TESTS, ASSUME ZERO COST PASS-THROUGH

Option	1% Revenue test		3% Revenue test	
	Number of small firms	Percent of small firms	Number of small firms	Percent of small firms
Self-inspection and certification; 1 acre or more	126	<0.01	42	<0.01
Codify CGP, self inspection, certification; 5 acres or more	428	0.07	140	<0.01
No regulation	0	0	0	0

Source: Economic Analysis.

XIII. Cost-Effectiveness Analysis

EPA has conducted a cost-reasonableness analysis that indicates that the cost of this proposal for option 2 is about $0.01 per pound for TSS. EPA customarily performs a cost-effectiveness (C–E) analysis using toxic-pound equivalents. The pollutant removal calculations in today's proposed rule are all based on TSS, a conventional pollutant. The Agency does not have a methodology for converting TSS to toxic pound equivalents for a C–E analysis.

XIV. Non-Water Quality Environmental Impacts

Under sections 304(b) and 306 of the CWA, EPA is to consider the "non water quality" environmental impacts when setting effluent limitation guidelines and standards. EPA used various methods to estimate the NWQI for each of the options considered for today's proposed rule. For the purposes of today's proposal, the Agency interprets the term "non water quality" impacts to mean environmental impacts other than those related to surface water quality, and therefore is including groundwater impacts in this section.

A. Air Pollution

EPA estimates that today's proposed rule would have no measurable effect on air pollution because none of the proposed options (including the "no change" option), would significantly alter the use of heavy equipment at construction sites, nor the manner in which construction sites are prepared. Accordingly, the levels of exhaust emissions from diesel-powered heavy construction equipment and fugitive dust emissions generated by construction activities would not change substantially from current conditions.

B. Solid Waste

Generation of solid waste would not be substantially affected regardless of the option selected because the majority of solid waste generated at construction activities derives from wastage of materials brought onto and used at construction sites. Likewise, for redevelopment projects, the amount of solid waste generated, while greater than the amounts generated at new developments, would not vary regardless of the option selected (including the "no change" option).

C. Energy Usage

The consumption of energy as a result of today's proposed rule is not expected to be measurably affected regardless of the option selected because the operations that currently consume energy (both direct fossil fuel use and electricity) will not be changing to any substantial degree during land disturbance.

D. By-Products From BMPs

EPA projects that by-products from BMPs used during the construction phase as a result of today's rule would not substantially change the pollutant types or quantities generated. Pollutant sources during the construction phase are primarily characterized by sediment from the in-place soils (trapping and ultimate removal or repositioning on the site), various constituents in excess concrete slurry and wash water (these include high pH and solids, such as sand and the fine particulate matter that comprise cement), and the possible residual effects from soil amendments such as polyacrylamide (PAM).

XV. Environmental Assessment

A. Introduction

In its Environmental Assessment (see "Supporting Documentation"), EPA evaluated environmental impacts associated with the discharge of storm water from construction activities. Construction and land development activities can generate a broad range of environmental impacts by introducing new sources of contamination and by altering the physical characteristics of the affected land area. In particular, these activities can result in both short- and long-term adverse impacts to

surface water quality in streams, rivers, and lakes within the affected watershed by increasing the loads of various pollutants in receiving water bodies, including sediments, metals, polynuclear-aromatic hydrocarbons (PAHs), oil, grease, pathogens, and nutrients. Groundwater can also be adversely affected through diminished recharge capacity. Other potential impacts may include the physical alteration of existing streams and rivers due to excessive flow and velocity of storm water runoff. The 1998 National Water Quality Inventory identifies siltation as one of the leading pollutants contributing to impairments in assessed stream miles, and lists urban runoff and hydrologic modification as two of the leading sources of impairments.

Sediment is an important and ubiquitous constituent in urban storm water runoff. Surface runoff and raindrops detach soil from the land surface, and this often results in sediment transport into streams. Sediment can be divided into three distinct subgroups: turbidity, suspended solids, and dissolved solids. Total suspended solids (TSS) are a measure of the suspended material in water. The measurement of TSS in urban storm water allows for estimation of sediment transport, which can have significant effects locally and in downstream receiving waters. Turbidity is a function of the suspended solids and is a measure of the ability of light to penetrate the water. Turbidity can exhibit control over biological functions, such as the ability of submerged aquatic vegetation to receive light and the ability of fish to breathe dissolved oxygen through their gills. Total dissolved solids are a measure of the dissolved constituents in water and are a primary indication of the purity of drinking water.

Using total suspended solids (TSS) as an indicator pollutant, EPA quantified the impacts of construction site storm water discharges on water quality. As detailed in the economic assessment and described in section XII of today's document, economic benefits were estimated to the extent reductions in water quality impacts could be attributed to implementation of the proposed rule.

B. Methodology for Estimating Environmental Impacts and Pollutant Reductions

For purposes of the environmental assessment, EPA is using the term "impact" broadly to refer to negative conditions related to elevated concentrations of pollutants, physical destruction of habitat by excessive flows, elevation of water temperature, and loss of fish spawning access due to new road crossings.

The Agency was able to assess only a subset of all of the potential environmental impacts of storm water discharges from construction sites. Construction activities generate initial environmental impacts on each acre of land as the land is converted from an undeveloped state (e.g., forest or rural land) to a developed condition. In addition, environmental impacts continue long after construction activities are completed because developed lands are permanently and hydrologically altered from their pre-developed state. Hydrologic changes result from alterations in storm water discharge patterns and characteristics that can lead to ongoing environmental damages.

In its analysis of the options contained in this proposal, EPA only considered the benefits that result from reductions in sediment discharges that occur while land is disturbed due to implementation of erosion and sediment controls and conducting site inspections and certifications. The Agency limited its analysis to this category of impacts primarily because some environmental impacts are difficult to correlate with a specific industry activity and/or assess on a national basis due to the wide variety of pollutants and sources of impairment present in a water body. The technical tools and analytical approaches available simply do not lend themselves to isolating impacts attributable to this industry from other sources.

For this analysis, EPA first analyzed loadings that would occur nationwide in the absence of any erosion and sediment control requirements. EPA built on an earlier analysis developed for the Phase II rulemaking and described in the Phase II economic analysis (op. cit.). This analysis estimated sediment discharged from a variety of "model construction sites" incorporating various site characteristics (3 soil erodibility levels with 5 slopes in 15 climatic regions). From this model site analysis, EPA was able to estimate that the total sediment discharged from construction sites nationwide in the absence of any controls would be about 90 million tons per year. EPA did not calculate the total reduction in this loading that is expected to occur following implementation of existing Federal, State and local requirements (the baseline condition), but rather estimated the expected incremental reduction that would result from the proposed options. For option 1, EPA estimated based on its experience and engineering expertise that the additional site inspection and certification provisions would reduce this national loading estimate by approximately 5 to 15 percent (a midpoint estimate of this range was used for calculating benefits) over the reductions attributable to existing requirements. For option 2, EPA estimated based on its experience and engineering expertise that the additional site inspection and certification provisions along with the technology requirements would reduce this national loading estimate by approximately 25 percent over the reductions attributable to existing requirements. EPA then further subdivided these loading estimated into two size categories, turbidity and settleable solids, in order to estimate specific benefits estimates using appropriate indicators. EPA estimated based on its experience and engineering expertise that the sediment discharged would be comprised of 80 percent particles as settleable solids and 20 percent of particles as turbidity, by mass. The settleable solids loads are used to calculate monetized benefits for water storage capacity and navigational dredging. The turbidity producing solids loads are used to calculate monetized benefits for water treatment. The annual loads were reduced to reflect states with equivalent programs for Option 1 and Option 2. The supporting documents discusses in detail this analysis.

EPA solicits data and comments on this approach, as well as the merits of conducting a more detailed analysis that estimates actual BMP efficiencies and associated national loadings reductions. EPA also solicits data and comments on conducting an analysis that incorporates other pollutant indicators, such as nutrients, metals and any additional pollutants that would be attached to sediments or contained in runoff discharged from construction sites.

C. Potential Loading Reductions of Proposed Options

EPA used TSS as the primary indicator to evaluate loadings reductions and to determine potential water quality benefits of the proposed options. Reductions in TSS from construction sites would arise from greater oversight of construction activities and better implementation of BMPs (Options 1 and 2), as well as more efficient BMPs in certain cases (Option 2). The estimated reductions due to implementation of EPA's proposed Option 1 would be an annual reduction of 1.05 million tons of turbidity producing solids per year and a reduction of 4.2 million tons of

settleable solids per year. The estimated reductions due to Option 2 would be 2.2 million tons of turbidity producing solids per year and a reduction of 8.9 million tons of settleable solids per year. EPA expects that the potential for considerable benefits from today's proposal exists due to decreases in sediment discharges to water bodies. EPA solicits data and comments that can provide information on the extent of impairments that are caused by the construction and land development industries, and methods of quantifying the benefits of today's proposal.

XVI. Benefit Analysis

EPA has identified, quantified and monetized certain benefits attributable to the construction co-proposal options in today's document. For some benefits, EPA has identified benefits categories, but is unable to quantify and/or monetize them at this time. Section XV, Environmental Assessment, established the analytical framework for the benefits analysis.

A. Benefits Categories Estimated

As discussed in section XV, EPA has chosen TSS as the most appropriate environmental indicator for the analysis of environmental impacts and benefits analysis. The primary environmental indicator selected was sediment entering waterways. The Agency used a simplified approach for the environmental assessment, because monitoring representative sites for a cross-section of the 2.2 million acres developed would not be technically and economically feasible.

Section XV.C discusses the anticipated amount of TSS removals as a result of today's document. The Agency estimates that 11.1 million tons of TSS each year would be removed from construction site discharges with Option 2 and 5.3 million tons of TSS each year would be removed with Option 1 presented in today's proposal. EPA used its experience and engineering expertise to determine the amount of TSS removal that each option would achieve.

When identifying environmental impacts to assess for this industry, the Agency decided against analyzing impacts that are extremely difficult to correlate with the specific industry activity and/or assess on a national basis. Large natural variations in watershed ecology (e.g., changes in species diversity, density of aquatic species) and variable climatic conditions greatly complicate the task of determining cause and effect with regard to construction site storm water discharges. In particular, the Agency did not analyze construction impacts in the following areas: (1) Habitat/biology, (2) stream temperatures, (3) flow and velocity, (4) conventional pollutants and pollutant loadings, (5) human health, and (6) groundwater. EPA believes that these benefit categories may have substantial benefits. However, the Agency has chosen not to analyze these benefits at this time for the proposed options because EPA is unable to quantify and/or monetize them. EPA solicits comments on appropriate methods to quantify these benefits categories.

B. Quantification of Benefits

TSS discharged from construction sites have a substantial and adverse impact on downstream property owners. The TSS is suspended in the water column that may serve as a source of drinking water for a community or municipal water system. When influent for drinking water supplies is contaminated with TSS, the system would likely need to treat the water to remove the TSS and provide additional disinfection before distribution to system customers. These costs will lead to rate increases for drinking water system customers. Thus, the upstream actions of the construction activity impose both direct costs (e.g., higher treatment costs for utility operators) and indirect costs (e.g., higher water bills for system customers). These costs could be reduced by controlling construction site runoff through the use of erosion and sediment controls and other BMPs.

Another impact of the discharge of sediment from construction sites is to reduce the capacity of water storage reservoirs. Settleable solids fall out of suspension and settle into water storage reservoirs. These accumulated solids reduce the capacity of the reservoir to hold as much water as in the past. With the reduced capacity of the water reservoir, the water supply system will bear the direct cost of dredging the water supply reservoir or replacing the water reservoir as it is taken out of service for accumulation of sediment. Water system customers generally bear indirect costs through rate increases. Again, by installing erosion and sediment controls and other BMPs at construction sites, these costs can be reduced.

Yet another impact of construction and the discharge of TSS and storm water is the sediment that falls out of suspension and into navigational and shipping channels. In most cases, the public pays for the consequent dredging through taxes and/or higher cost of products. Use of erosion and sediment controls and construction sites can also reduce these costs.

Reduced costs for water treatment, water storage, and navigational dredging are three benefit categories that EPA is using to estimate the benefits of the proposed rule. The Agency believes that there are many more benefits to this rule, but the state-of-the-art of benefit analysis does not provide the tools at this point to quantify and monetize them. For example, habitat preservation and protection is not easily quantified and estimated for benefits analysis. However, we know that people value habitat protection, because they are spending funds to repair streams for habitat preservation and protection.

EPA has formulated a numeric estimate of the benefits of the proposed options by determining the reduction in the amount of sediment discharged from construction sites and in turn quantifying certain environmental benefits. In particular, the amount of sediment reduced is the primary variable in the benefits analysis.

EPA identified three potential economic methods to monetize the benefits: (1) Avoided damages, (2) contingent evaluation, (3) hedonic assessments of property values. The Economic Analysis provides the details of these methods. The method that the Agency used initially to monetize benefits is the method of avoided damages. EPA recognizes that avoided damages is not the preferred approach and is working to improve its methods. The Agency also considered contingent evaluation and hedonic assessments to validate and confirm the avoided damages methodology.

The avoided damages approach is a method that considers the damages avoided as a result of the proposal. EPA has analyzed the magnitude of costs primarily using the avoided damages. This method may also be referred to as the avoided cost approach. This method uses the costs of repair to estimate the benefits. These are costs that could be avoided if construction sites did not discharge sediment and storm water into surface waters.

These costs are used to estimate the monetary value of the benefits of the proposal. EPA has also looked at academic literature for contingent valuation studies, such those used in the economic analysis for the NPDES Phase II storm water regulations. The Agency has used those studies to validate the benefits models and for sensitivity analyses to gain a clearer picture of the benefits of the proposed rule. Additional information on the benefits analysis may be found in the

Environmental Assessment and Economic Analysis.

The benefits analysis results are shown in Table XVI–1.

TABLE XVI–1.—ANNUAL BENEFITS FOR PROPOSED CONSTRUCTION AND DEVELOPMENT REGULATORY OPTIONS

Benefit categories	Regulatory options		
	Option 1 (Self-inspection, certification; 1 acre or more)	Option 2 (Codification, self-inspection, certification; 5 acres or more)	Option 3 (No regulation)
Turbidity Reduction			
Turbidity producing solids (million tons per year)	1.05	2.2	0
Water treatment monetized benefits (year 2000 $ millions)	0.1	0.2	0
Settleable Solids Reduction			
Settleable Solids (million tons per year)	4.2	8.9	0
Water storage monetized benefits (year 2000 $ millions)	7.6	16.0	0
Navigational dredging monetized benefits (year 2000 $ millions)	2.7	5.8	0
Total Monetized Benefits (year 2000 $ millions)	10.4	22.0	0

Source: Economic Analysis; Environmental Assessment.

XVII. Benefit-Cost Comparison

EPA has conducted a benefit-cost analysis of the construction and development effluent guidelines proposed in today's document. The benefit-cost analysis may be found in the complete set of support documents. Sections XII, XV, and XVI of this preamble provide additional details of the benefit-cost analysis.

Table XVII–1 provides the results of the benefit-cost analysis.

TABLE XVII–1.—TOTAL ANNUALIZED BENEFITS AND COSTS OF THE PROPOSED REGULATORY OPTIONS

[Tons of sediment, year 2000 $]

Option	Costs (2000 $ millions per year)	Benefits (2000 $ millions per year)
Self-inspection, certification; 1 acre or more	130	10.4
Codification, self-inspection, certification; 5 acres or more	505	22.0
No regulation	0	0

XVIII. Regulatory Implementation

A. Compliance Dates

C&D sites must comply with the C&D regulation, once finalized, at the time of issuance, re-issuance, or modification of their NPDES permit.

New sources must comply with the new source performance standards (NSPS) (once it is finalized) at the time they commence discharging process wastewater (i.e., storm water runoff from land disturbing construction activities). Because the final rule is not expected within 120 days of the proposed rule, the Agency considers the date for compliance under NSPS to be when the discharge from a new source construction site commences following promulgation of the final rule (see 40 CFR 122.2). See section X.D of today's document for the discussion on defining new sources for the C&D category.

EPA expects to issue a renewed Construction General Permit (CGP) in 2003. Following promulgation of the C&D rule, which is expected in 2004, the Agency plans to incorporate the provisions of any effective ELG at the time of the next permit renewal. Based on the standard five-year period for NPDES permits, that renewal would take place in 2008. However, States that have issued either general or individual permits may choose a different (i.e. shorter) time period to implement the final effluent guidelines requirements. EPA requests comment on this planned schedule.

B. Relationship of Effluent Guidelines to NPDES Permits

Effluent limitation guidelines and pretreatment standards act as a primary mechanism to control the discharges of pollutants to waters of the United States. Once finalized, the proposed C&D regulations would be applied to sites through individual NPDES permits or a general permit issued by EPA or authorized States under section 402 of the Act.

The Agency has developed the limitations for this proposed rule to cover the discharge of pollutants for this industrial category. In specific cases, the NPDES permitting authority may elect to establish technology-based permit limits for pollutants not covered by this regulation. In addition, if State water quality standards or other provisions of State or Federal law require limits on pollutants not covered by this regulation (or require more stringent limits or standards on covered pollutants to achieve compliance), the permitting authority must apply those limitations or standards.

C. Upset and Bypass Provisions

A "bypass" is an intentional diversion of the streams from any portion of a treatment facility. An "upset" is an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. EPA's regulations concerning bypasses and upsets for direct dischargers are set forth at 40 CFR 122.41(m) and (n).

Because much of today's proposal includes design standards for design, installation, and maintenance of ESC BMPs, EPA considered the need for a bypass-type provision in regard to large storm events. However, EPA did not specifically include such a provision because today's proposed design standards only require BMPs to be designed to capture a specified volume of storm runoff for pollutant removal. Because EPA is not establishing requirements for control of larger storm events, specific bypass provisions were not necessary.

D. Variances and Waivers

The CWA requires application of effluent limitation guidelines established pursuant to section 301 to all direct dischargers. However, the statute provides for the modification of these national requirements in a limited number of circumstances. Moreover, the Agency has established administrative mechanisms to provide an opportunity for relief from the application of the national effluent limitation guidelines for categories of existing sources for toxic, conventional, and nonconventional pollutants. "Ability to Pay" and "water quality" waivers do not apply to conventional or toxic pollutants (e.g., TSS, PCBs) and, therefore, do not apply to today's proposal. However, the variance for Fundamentally Different Factors (FDFs) may apply in some circumstances.

1. Fundamentally Different Factors Variance

EPA will develop effluent limitations or standards different from the otherwise applicable requirements if an individual discharging facility is fundamentally different with respect to factors considered in establishing the limitation of standards applicable to the individual facility. Such a modification is known as a "fundamentally different factors" (FDF) variance.

Early on, EPA, by regulation provided for the FDF modifications from the BPT and BAT limitations for toxic and nonconventional pollutants and BPT limitations for conventional pollutants for direct dischargers. For indirect dischargers, EPA provided for modifications for PSES. FDF variances for toxic pollutants were challenged judicially and ultimately sustained by the Supreme Court. (*Chemical Manufacturers Assn* v. *NRDC,* 479 U.S. 116 (1985)).

Subsequently, in the Water Quality Act of 1987, Congress added new section 301(n) of the Act explicitly to authorize modifications of the otherwise applicable BAT effluent limitations or categorical pretreatment standards for existing sources if a facility is fundamentally different with respect to the factors specified in section 304 (other than costs) from those considered by EPA in establishing the effluent limitations or pretreatment standard. Section 301(n) also defined the conditions under which EPA may establish alternative requirements. Under section 301(n), an application for approval of a FDF variance must be based solely on (1) information submitted during rulemaking raising the factors that are fundamentally different or (2) information the applicant did not have an opportunity to submit. The alternate limitation or standard must be no less stringent than justified by the difference and must not result in markedly more adverse non-water quality environmental impacts than the national limitation or standard.

EPA regulations at 40 CFR part 125, subpart D, authorizing the Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. Thus, 40 CFR 125.31(d) identifies six factors (e.g., volume of process wastewater, age and size of a discharger's facility) that may be considered in determining if a facility is fundamentally different. The Agency must determine whether, on the basis of one or more of these factors, the facility in question is fundamentally different from the facilities and factors considered by EPA in developing the nationally applicable effluent guidelines. The regulation also lists four other factors (e.g., infeasibility of installation within the time allowed or a discharger's ability to pay) that may not provide a basis for an FDF variance. In addition, under 40 CFR 125.31(b) (3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either (a) a removal cost wholly out of proportion to the removal cost considered during development of the national limitations, or (b) a non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limits. EPA regulations provide for an FDF variance for indirect dischargers at 40 CFR 403.13. The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers.

The legislative history of section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at 40 CFR 125.32(b)(1) are explicit in imposing this burden upon the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by the EPA in establishing the applicable guidelines. An FDF variance is not available to a new source subject to NSPS.

2. Low Soil Loss Potential Waiver

Some sites may qualify for a waiver due to low potential for soil loss. The waiver is provided for small sites (1 to 5 acres) in the existing NPDES storm water regulations. See § 122.26(b)(15)(i)(A).

E. Other Clean Water Act Requirements

Compliance with the provisions in any of the rules proposed today would not exempt a discharger from any requirement for a permit for dredged or fill material under section 404 of the CWA.

XIX. Related Acts of Congress, Executive Orders, and Agency Initiatives

A. Paperwork Reduction Act

The information collection requirements in today's proposed rule have been submitted for approval to OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA (ICR No. 1842.03) and a copy may be obtained from Susan Auby by mail at Collection Strategies Division; U.S. Environmental Protection Agency (2822T); 1200 Pennsylvania Ave., NW, Washington, DC 20460, by email at *auby.susan@epa.gov,* or by calling (202) 566–1672. A copy may also be downloaded from the internet at *http://www.epa.gov/icr.* In today's proposed Option 2, 40 CFR 450.21(f) and (g) would require operators to maintain a site log. The equivalent provision in proposed Option 1 is 40 CFR 122.44(t). See section X.D. of today's document for a description of these provisions. EPA estimates that this provision would create a total annual burden of about 760,158 hours for Option 1 and 633,033 hours for Option 2. This estimate is the incremental burden above the currently-approved burden level for the EPA and State construction general permits. EPA has received OMB approval for the current permit requirements under control no. 2040–0188, "Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit."

In today's proposed Option 2, 40 CFR 450.21(a) would require permittees to prepare a Storm Water Pollution Prevention Plan (SWPPP). This requirement would essentially codify current CGP requirements and no additional burden would be imposed.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a

Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

Comments are requested on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW, Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th St., NW, Washington, DC 20503, marked "Attention: Desk Officer for EPA." Include the ICR number in any correspondence. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after June 24, 2002, a comment to OMB is best assured of having its full effect if OMB receives it by July 24, 2002. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

B. Unfunded Mandates Reform Act (UMRA)

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule contains a Federal mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year. Accordingly, EPA has prepared under section 202 of UMRA a written statement which is summarized below.

EPA is proposing the technology-based construction and development (C&D) effluent guidelines under sections 301, 304, 306, 308, 402,and 501 of the Clean Water Act CWA), 33 U.S.C. 1311, 1314, 1316, 1318, 1342 and 1361 and under authority of the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*

Today, EPA is co-proposing three options for this C&D effluent limitation guideline: (1) Construction site permittee self-inspection and certification, (2) "codify" provisions of the current EPA construction general permit with inspection and certification, and (3) no regulation. EPA is considering each of the three options; no option is preferred over the other. Options 1 and 2 would impose a mandate on the States, local, or Tribal governments, in the aggregate, or private sector that would exceed $100 million per year. Option 3 would not impose a mandate with costs that exceed $100 million per year for the public or private sectors. The Agency has conducted economic analyses for each of the three options, which are provided in the Economic Analysis for today's proposed rule (see "Supporting Documentation"). Additional summary economic information may be found in sections XII, XVI, and XVII of today's document.

Option 1 would establish permittee self-inspection and certification requirements to improve the effectiveness of ESCs at construction sites subject to NPDES storm water permits. Option 1 would apply to sites 1 acre or more. This option would require permittees to periodically inspect their ESCs during land disturbing activities and certify that they have been properly installed and maintained. Option 1 would cost about $130 million annually; the benefits for this option are about $10 million per year. This option would encourage permittees to adopt better ESC practices and, in the process, reduce discharges of sediment and other pollutants from those sites. Under Option 1, EPA estimates that State and local governments would incur about $13 million in annual costs and the private sector would incur about $117 million in annual costs. Of the $13 million in annual costs to State and local governments, about $3 million would be incurred by small government entities, less than 50,000 population, and about $10 million annually would be incurred by large government entities, equal to or greater than 50,000 population. EPA has determined that this option is the least expensive of the set of two regulatory options in today's proposal. Option 1 would amend the existing NPDES regulations and improve the effectiveness of the storm water permit program. The no regulation option, discussed later in this section, is the least expensive proposed option in terms of direct costs outlays.

Option 2 would establish a new national standard for ESC at construction sites of five acres or more, basically codifying the requirements of EPA's construction general permit. In addition, this option would add permittee self-inspection and certification requirements for ESCs to improve compliance. EPA estimates that these controls would remove, on average, 80 percent of the total suspended solids (TSS) discharged from construction sites. The problem that EPA is addressing through this proposed rule is the need to reduce construction site erosion and reduce the amount of sediment discharged during land disturbance activities. EPA estimates that Option 2 would cost about $505 million annually and would have about $22 million in annual monetized benefits. The benefits of the

proposal would accrue to the public in the form of reduced sediment and polluted storm water discharged to the Nation's surface waters. The sediment and polluted storm water is discharged from active construction sites and settles into stream beds, drinking water reservoirs, and navigational channels. If the excess sediment discharged from construction sites could be reduced or avoided altogether, the public would benefit with improved water quality and less frequent dredging of drinking water reservoirs and navigational channels. This option is the more expensive of the options. The codification of the CGP plus self-inspection and certification (Option 2) would improve controls at construction sites and in the process reduce the amount of sediment and storm water discharged from construction sites. EPA found that the cost of sediment removed is about $0.01 per pound. The Agency believes that this cost is reasonable for the pollutant reduction achieved.

Under Option 2, about $50 million of annual incremental costs would accrue to State and local governments and about $455 million to the private sector. The Agency does not have data to estimate the costs to Tribal lands and is searching for additional information about Tribal lands for the final rule. The Agency requests information about the impacts and costs on Tribal lands. Of the $50 million in costs accruing to State and local government agencies, about $5 million per year would be incurred by small government agencies, communities with less than 50,000 population, and about $45 million would accrue to large communities, those with more than 50,000 population. EPA has analyzed the impacts on small government entities. This analysis is discussed later in this section. EPA estimates that about $2 million of the annual benefits will come from improvements to State and local government-funded projects and about $20 million in benefits will come from improvements to private sector projects. This distribution of the benefits reflects the distribution of construction and development in the United States economy. About 25 percent of all construction is funded by Federal, state and local governments, according to the 1997 Census of Construction. The Federal portion of the incremental costs of the proposal are not covered by UMRA.

State and local governments may find resources available at the Federal, State and local level to defray some of the costs associated with the proposed rule. The Clean Water Act State Revolving Fund (SRF) provides capitalization grants to eligible States, that provide a twenty percent match, and then provide financial assistance to municipalities or State agencies. Some of these funds are eligible to finance storm water controls. In some cases, these funds are available to the private sector if projects are located in a designated estuary. Other funds are available through other programs such as grant and loan programs, public/private partnerships, and private sector contributions.

This proposal will not have any disproportionate impacts on particular regions of the country, or particular State, local, or Tribal governments, or communities, or particular segments of the private sector. The regulatory options proposed in today's document apply broadly to the construction and development industry in the United States. The proposed options will have an impact in those locations, wherever they happen to be, in which construction and development is occurring. Over time, different regions of the country experience more construction and development than other regions of the country. For example, at this time, California and Texas are experiencing a relatively large amount of development, along with Florida and Pennsylvania.

Option 3 is the no-regulation option for the construction and development industry. Under Option 3, there would be no costs or benefits directly attributable to government entities or to the private sector, with the following important exception. Executive Order 12866 advises agencies to consider the state of the world before and after the prospective regulation. Under the no-regulation option, the current state of the world would not be changed, nor would the discharge of sediment into the Nation's surface waters from C&D activities. These partially-controlled sediments would continue to contribute to the loss of water quality, and sedimentation in water reservoirs and streams. These effects can be attributed as costs imposed on society as an externality, and realized when choices are made to reclaim or restore the functionality of the water body. EPA's benefit methodology is limited in terms of the state-of-the-art to monetize these benefits. However, the Agency believes that the benefits may be substantially larger than EPA is claiming through monetized benefits.

Additional information about the costs and economic impacts of the proposed rule may be found in section XII of today's document. In addition, section XVI and section XVII of today's document provide information and analyses about the environmental assessment and benefit analysis. The analyses for these proposed options may be found in the support documents in the record for this proposed action.

The proposed regulatory options would not impose any costs on the industry or government entities after termination of the applicable NPDES permits. Option 1 would require only permittee self-inspection and certification activities during the active construction period. Option 2, in addition to the inspection and certification requirements, would require installation, operation and maintenance of temporary ESCs during the active construction period. Option 2 would not require maintenance of these controls after the active construction period.

EPA has determined that the mandates under this proposal will not have a significant impact on the national economy in the form of productivity, economic growth, full employment, creation of productive jobs and international competitiveness. Nevertheless, the Agency has conducted an extensive analysis of the economic impacts of the proposed rule on the construction and development industry and the national economy. These analyses are presented in section XII of today's document. While the impact analysis shows that less than one percent of firms in the industry could potentially fail under the rule and that less than one percent of jobs in the industry could be lost from the most stringent options under analysis, the Agency concluded that, based upon the scale of this industry which is a major component of the U.S. economy, even a small percentage of jobs or firms closed is significant, especially in a sluggish economy. Accordingly, the burden on the economy is one of the reasons the Agency rejected more stringent options. The options proposed today are a result of an extensive economic analysis of a suite of construction and storm water options. The Agency determined that Option 1 is the least costly and least burdensome regulatory option.

EPA is not required by UMRA to consult with elected representatives (or their designated authorized employees) of the affected State, local, and Tribal governments, because the proposed rule would not impose a Federal mandate on State, local and tribal governments, in the aggregate, of $100 million or more in any one year. The Agency estimates that the costs to State, local and tribal governments is about $50 million on an annual basis. Nevertheless, EPA has conducted outreach to the public and private sectors to obtain their input on the proposed regulations. The Agency

has conducted two national public meetings in the past year: one in Washington, DC and one in Denver, Colorado. Representatives of several State and local agencies, and engineering consultants representing builders and developers attended these national meetings. The Agency also convened a 60-day Small Business Advocacy Review (SBAR) Panel on July 16, 2001 to obtain input from the small business community on the possible impacts of the proposed regulations on small businesses. The SBAR Panel was composed of representatives of the Office of Management and Budget, the Small Business Administration, and EPA. The SBAR Panel met with small entity representatives (SERs) and held conference calls with the SERs to discuss the impact of the proposal. The Panel issued a final report to the Administrator in October 2001. In addition, through the auspices of the National Association of Home Builders (NAHB), EPA conducted six focus group meetings with residential builders and developers to learn more about the economic and business practices of the construction and development industry. Finally, the Agency has conducted numerous conference calls with builders and developers to learn more about their business and technical practices and participated in conferences and meetings across the country.

EPA has determined that none of the options proposed today might significantly or uniquely affect small governments. Thus, today's rule is not subject to the requirements of section 203 of UMRA. Nevertheless, the Agency has taken steps to provide information and accessability to small government agencies. The Agency has conducted an extensive small government economic impact analysis, because the Agency wants to understand the impacts of the proposed rule. Moreover, the Agency usually conducts a small government analysis for all effluent guidelines to comply with all applicable Federal requirements and Executive Orders. The most expensive proposed regulatory option would impose requirements for ESC at construction sites. These requirements are technology-based requirements for construction sites that are designed to work with the NPDES storm water program. Some construction and development projects are funded by State and local governments, but most are funded by the private sector. The Agency has determined that about 12 percent of all projects funded by State and local governments are funded by small government entities, those with a population under 50,000, and about 88 percent are funded by large governments, those with a population greater than 50,000. EPA's economic analysis shows that the cost to small governments of the most costly option is significantly less than one tenth of one percent of the revenues of those communities.

Nevertheless, EPA considered approaches to reduce any impact and assessed methods to find better ways to meet the objectives of the proposal with as few impacts as possible. EPA used several methods to determine costs to small communities, and each method shows that the cost to small communities from the most costly option is much less than one tenth of one percent of their annual revenues. Under one method the Agency compared the aggregate incremental costs of the most costly option to small governments with the aggregate annual revenue of small governments. In another method, the Agency analyzed the impacts on average small government agencies, based upon data on small government annual revenues and costs. As a result, this rule will not result in a significant cost to small communities. The Agency requests comment on the impacts on small communities from the requirements under this proposal. The small government agency analysis can be found in the Economic Analysis.

EPA is developing procedures and methods with which to provide information about this proposal to small government agencies. In particular, the Agency has established a website to distribute information to the public, industry, and government entities, in particular small government agencies, about today's proposed rule. The website may be accessed at *http://www.epa.gov/waterscience/guide/construction/*. This website provides information on EPA's effluent guidelines program and will contain information about today's proposed regulation.

C. Regulatory Flexibility Act (RFA) as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA)

1. Introduction

The RFA, 5 U.S.C. 601 *et. seq.*, generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, EPA defined: (1) Small businesses, according to SBA size standards, as construction businesses that receive less than $27.5 million in annual revenue and developers that receive less than $5 million in annual revenue; (2) small government jurisdictions as small governments of a city, county, town, school district or special district with a population of less than 50,000; and (3) small organizations as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

In accordance with section 603 of the RFA, EPA has prepared an initial regulatory flexibility analysis (IRFA) that examines the impact of the proposed rule on small entities along with regulatory alternatives that could reduce that impact. The IRFA is available for review in the docket and is summarized below.

The objective for the proposed effluent guidelines for the construction and development (C&D) industry is to reduce sediment and storm water discharged from active construction sites. EPA's analysis indicates that storm water discharges from construction sites contribute sediment to the nation's surface waters that is deposited in stream beds, lakes, navigational channels, and water supply reservoirs. Notwithstanding the social policy objective of reducing sediment and storm water discharges, EPA has conducted extensive analyses of the impacts on small businesses based upon the costs and impacts of three co-proposed options. EPA used the small business analyses to identify approaches that would reduce and minimize impacts on small businesses, while at the same time striking a balance that would achieve the highly desirable goal of reducing storm water pollution. EPA also is soliciting comments on other, less costly approaches to meet the objective of the proposal. The Economic Analysis in its entirety and the initial regulatory flexibility analysis (IRFA)(Chapter 6 within the Economic Analysis) provide EPA's analysis of the proposed requirements on small business entities. Additional information on the economic impacts and, in particular, the impacts on small businesses, may be found in section XII of today's document.

EPA proposes to set technology-based effluent guidelines to control sediment and storm water discharges from active

construction sites. Construction and development activity disturbs the soil on construction sites, and, in the process, releases sediment and storm water into surface streams, lakes, and water supply reservoirs. See section VI.B.2, Clearing, Excavating and Grading of today's document for additional details. Disturbed soil, if not managed properly, can be easily washed off-site during storm events. Storm water and sediment discharges during construction can cause an array of physical, chemical and biological impacts. Water quality impairment results, in part, because pollutants available at construction sites are released into surface waters. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients (nitrogen and phosphorous), metals and organic compounds into surface waters and aquatic systems.

The proposed rule would establish technology-based effluent guidelines for the control of erosion and sediment on active construction projects. The technology-based options would complement the requirements of the existing NPDES storm water requirements. EPA is proposing this regulation under the authorities of sections 301, 304, 306, 308, 402 and 501 of the Clean Water Act, 33 U.S.C. 1311, 1314, 1316, 1318, 1342 and 1361 and under authority of the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*, Public Law 101–508, November 5, 1990.

For purposes of assessing the economic impacts of today's rule on small entities through the IRFA, "small entity" is defined by SBA size standards for small businesses and RFA default definitions for small governmental jurisdictions and small organizations. The small entities directly regulated by this proposed rule include small land developers, small residential construction firms, small commercial and industrial firms, and small special trade firms. Over ninety percent of the businesses in the construction and development industry are small businesses. EPA recognizes the tremendous contributions that these small businesses make to the fabric of the American economy. Accordingly, the Agency has attempted to reduce impacts to small businesses while, at the same time, working to identify ways to achieve the objective of today's document.

Table XII–8 in section XII of today's document presents the results of EPA's small business analysis.

EPA also has analyzed the projected reporting, recordkeeping, and other compliance requirements under the Paperwork Reduction Act for today's proposed rule, including an estimate of the classes of small entities that would be subject to the proposed rule. The results of the analysis are reported in section XIX.A, Paperwork Reduction Act. EPA anticipates that small firms may incur some incremental costs for reporting, record keeping and other compliance requirements. However, these incremental costs are expected to be small. EPA has analyzed the incremental burden and costs of reporting and record keeping requirements. These costs are covered by the approved information collection request (ICR) for the existing NPDES Storm Water Program. Moreover, these costs are included in the engineering cost models and in the economic impact models that support the regulatory options in today's document.

EPA has not identified any rules that duplicate, overlap, of conflict with today's proposal. Moreover, this proposal would complement the existing NPDES storm water regulations.

There may be alternatives to the proposed options that accomplish the objectives of today's proposal. EPA is seeking comment on variations to these options and is particularly interested in information that would accomplish these objectives and minimize any significant economic impact on small entities.

The Agency as analyzed a broad suite of regulatory options and technology alternatives. The three regulatory options in today's document provide the final set of options that the Agency is considering for the proposal.

As required by section 609(b) of the RFA, as amended by SBREFA, EPA also conducted outreach to small entities and convened a Small Business Advocacy Review (SBAR) Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements. On July 16, 2001, EPA's Small Business Advocacy Chairperson convened the C&D SBAR panel under section 609(b). In addition to the Chairperson, the Panel consists of the Director of the Engineering and Analysis Division of the Office of Science and Technology within EPA's Office of Water, the Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget (OMB), and the Acting Chief Counsel for Advocacy of the Small Business Administration (SBA).

Prior to convening the Panel on July 16, 2001, EPA held a conference call/meeting on June 14, 2001 to receive information from prospective small entity representatives (SER) about plans for convening the Panel and their early concerns about the planned proposed regulation. EPA invited seven residential builders and developers, five heavy construction company representatives, one local government official, one trade association representative, and five consultants to serve as potential SERs during the pre-panel outreach process. The full Panel report lists the materials provided to the SERs and summarizes their comments. Their full written comments also are attached to the report. In light of these comments, the Panel considered the regulatory flexibility issues specified by RFA/SBREFA and developed the findings and discussion summarized below.

Consistent with the RFA/SBREFA requirements, the Panel evaluated the assembled materials and small-entity comments on issues related to the elements of the IRFA. A copy of the Panel report is included in the docket for this proposed rule.

2. Summary of Panel Recommendations

The SBAR Panel submitted a final report of the sixty day panel process, that convened on July 16, 2001, to the Administrator of EPA in October 2001. The following issues and EPA's response provides information about the discussions between the SBAR Panel and the SERs. The final SBAR Panel Report is available in the docket for the proposed effluent guidelines for the construction and development industry.

a. Related Federal Rules

• The Panel recommended that EPA, during the development of the proposed effluent guidelines, evaluate the adequacy of the current NPDES storm water program. The Panel also recommended that EPA proceed with the development of proposed effluent guidelines, but that in doing so, keep open the option of ultimately declining to promulgate final guidelines until the effectiveness of Phase I and Phase II, without national effluent guidelines, can be evaluated more fully.

EPA response. EPA is proposing a set of three options that is consistent with the comments from the Small Business Advocacy Review (SBAR) Panel. One of the options would require additional ESCs. The three options are: (1) Self-inspection and certification for projects one acre or more; (2) Codify the CGP with self-inspection and certification for projects five acres or more; (3) a no-regulation option that considers the possibility of not issuing a final

regulation. The Agency appreciates the comments from the SBAR Panel, and the regulatory options in today's document reflect the Panel's final report.

• The Panel further recommended the inclusion in the proposal of regulatory language that would provide a mechanism by which construction sites could meet the effluent guidelines requirement by complying with State and/or local regulations that provide a comparable level of environmental protection. The Panel also noted and endorsed EPA's intention to incorporate any additional requirements for ESC and storm water management developed under the effluent guidelines into the existing construction general permitting system, which should ease the regulatory burden associated with the new requirements, at least in terms of permitting and related paperwork costs.

EPA response. EPA plans to recognize States with excellent storm water programs. In those States, there would be no additional requirements beyond those currently in place. In addition, there would be no incremental costs to those States or the dischargers in those States.

EPA plans to implement the technology-based effluent guidelines through the existing NPDES storm water program. Moreover, EPA plans to implement the effluent guidelines through the construction general permits as recommended by the SBAR Panel.

b. Regulatory Alternatives

• Many of the SERs commented that quantitative or numerical effluent standards are not appropriate for storm water discharges. Another SER indicated that numeric limits are unproven in a construction discharge context and are extremely cost-ineffective. The Panel recommended against establishing across-the-board storm water monitoring requirements as part of the effluent guidelines.

EPA response. For the reasons discussed in section IX.B of today's document, EPA is not proposing quantitative or numerical effluent standards for construction and development, and is not proposing storm water monitoring requirements in today's proposed rule.

• The Panel urged EPA, as it conducts evaluations of the feasibility of establishing numeric effluent limitations to comply with the settlement agreement with NRDC, to fully consider the many challenges associated with developing numeric effluent standards, such as monitoring difficulties, site-specific variability, and the stochastic nature of rainfall and runoff events. The Panel recommended that EPA acquire and evaluate data on both costs and effectiveness of such requirements from sites across the country, reflecting a variety of geographic, weather, soil, and other site conditions, before it makes any determination on the utility and feasibility of such standards. The Panel also recommended that any BMP certification requirements that may be included in the guidelines be limited to design parameters only and not include performance certification or liability of the certifier for failure of BMPs to perform as expected.

EPA response. As described in the Agency's response to the previous Panel recommendation, EPA is not proposing quantitative or numerical effluent standards. EPA has compiled data from across the country and found that numeric limits and monitoring requirements are not the most effective tools for management and control of storm water discharges.

• Several SERs suggested that EPA base the effluent guidelines on the existing CGP requirements. The panel recommended that EPA give consideration to this approach and that, at a minimum, EPA should present it for comment in the preamble to the proposed effluent guidelines as a regulatory option under consideration.

EPA response. EPA gave considerable weight to this recommendation from the SBAR Panel. The Agency has concluded that using the technology-based requirements to complement those in the CGP has considerable advantages and served as the basis for one of the options proposed today.

c. Methodological Issues

• The Panel recommended that EPA fully evaluate the appropriateness of the selected baseline requirements and the estimated costs, and the regulatory requirements and their costs in the development of the proposed rule. The Panel further recommended that EPA specifically consider the comments of the SERs in this effort.

EPA response. EPA has assessed the baseline and understands the progress that the industry has made in improving the implementation of ESCs. The Agency has conducted an analysis that reflects the current level of progress and the progress anticipated under the existing storm water programs.

EPA invites comments on all aspects of this proposal and its impacts on small entities.

D. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, EPA has concluded that this rule is a "significant regulatory action." As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications." "Policies that have Federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have Federalism implications. It will not have substantial direct effects on the States, on this relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. EPA estimates that the average impact on all authorized States and local governments of the most expensive of the options

proposed today is $50 million (year 2000 $) annually. EPA does not consider an impact of $50 million (year 2000 $) on States and local governments a substantial effect. Moreover, this annual cost is less than one tenth of one percent of the revenues of State and local government.

Further, the revised regulations would not alter the basic State-Federal scheme established in the Clean Water Act under which EPA authorizes States to carry out the NPDES permitting program. EPA expects the revised regulations to have little effect on the relationship between, or the distribution of power and responsibilities among, the Federal and State governments. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comments on this proposed rule from State and local officials.

F. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This proposed rule is not subject to Executive Order 13045 because it does not concern an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. This rule is based on technology performance, not health or safety risks.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications."

"Policies that have Tribal implications" is defined in the Executive Order to include regulations that have substantial direct effects on one or more Indian Tribes, on the relationship between the Federal government and the Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian Tribes. This proposed rule does not have tribal implications. It will not have substantial direct effects on Tribal governments, on the relationship between the Federal government and Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes as specified in Executive Order 13175. Today's proposed rule contains no Federal mandates for Tribal governments and does not impose any enforceable duties on Tribal governments. Thus, Executive Order 13175 does not apply to this rule. In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and Tribal governments, EPA specifically solicits comment on this proposed rule from tribal officials.

H. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995, (Public Law 104–113, section 12(d); 15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

The Agency is not aware of any consensus-based technical standards for the types of controls contained in today's proposal. EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

I. Plain Language Directive

Executive Order 12866 requires each agency to write all rules in plain language. EPA invites comments on how to make this proposed rule easier to understand.

J. Executive Order 13211 (Energy Effects)

This rule is not a "significant energy action" as defined in Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The treatment systems required by today's proposal rely on passive treatment techniques that do not utilize mechanical equipment. The proposed rule may require larger sediment basins in certain cases, and therefore may result in the use of additional fuel for construction equipment conducting excavation and soil moving activities. EPA estimates that this additional fuel usage will be approximately 700,000 gallons per year, which is insignificant compared to the annual consumption in the United States.

XX. Solicitation of Data and Comments

A. Specific Solicitation of Comments and Data

EPA solicits comments on all aspects of today's proposal. In addition to the various topics on which EPA has specifically solicited comments throughout this proposal, EPA solicits comments in several additional areas.

Today's proposal at § 450.21(i) specifies requirements for permittees to remove accumulated sediment from sediment traps and ponds when design capacity has been reduced by 50 percent. Today's proposal does not require any other specific maintenance requirements, although some additional maintenance costs such as replacing mulching have been included in the costs of Option 2. EPA solicits comments on the assumption that these maintenance activities would be a natural outcome of the inspection requirements. Alternatively, EPA solicits comment on additional maintenance requirements that the Agency should consider requiring through regulation, as well as the costs and benefits of such requirements.

EPA solicits comments on the effectiveness and appropriateness of each of the technologies contained in today's proposal. The Agency also solicits comments on any other equivalent technologies the Agency should consider, as well as the costs,

benefits and effectiveness of such technologies.

EPA has attempted to capture all of the provisions of the EPA's "national" CGP (63 FR 7901, February 17,1998) in today's proposal. EPA solicits comments on the components of the CGP that were inadvertently left out of today's proposal, as well as the costs and benefits of such components. In addition, EPA recognizes that the EPA CGP is scheduled to be revised in 2003 and that certain provisions contained in the permit may change prior to final action on the effluent guideline. EPA solicits comments on the appropriate approach to take to reconcile any changes made in the EPA CGP with today's proposal.

B. General Solicitation of Comment

EPA encourages public participation in this rulemaking. EPA asks that commenters address any perceived deficiencies in the record supporting this proposal and that suggested revisions or corrections to the rule, preamble or record be supported by data. EPA invites all parties to coordinate their data collection activities with the Agency to facilitate mutually beneficial and cost-effective data submissions. Please refer to the **FOR FURTHER INFORMATION** section at the beginning of this preamble for technical contacts at EPA.

List of Subjects

40 CFR Part 122

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous substances, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 450

Environmental protection, Construction industry, Land development, Erosion, Sediment, Storm water, Water pollution control.

Dated: May 15, 2002.

Christine Todd Whitman,

Administrator.

For the reasons set out in the preamble, EPA proposes to amend title 40, chapter I of the Code of Federal Regulations as follows:

[Option 1]

Part 122 is proposed to be amended to read as follows:

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Section 122.44 is amended by revising paragraph (i)(4) and adding paragraph (t) to read as follows:

§ 122.44 Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs, see § 123.25).

* * * * *

(i) * * *

(4) Requirements to report monitoring results for storm water discharges associated with industrial activity (other than construction activity pursuant to 40 CFR 122.26(b)(14)(x) and those discharges addressed in paragraph (i)(3) of this section) shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge. * * *

* * * * *

(t) *Inspection and certification for construction site storm water discharges.*

(1) *Site log book.* The permittee for a point source discharge under § 122.26(b)(14)(x) or § 122.26(b)(15) shall maintain a record of site activities in a site log book. The site log book shall be maintained as follows:

(i) A copy of the site log book shall be maintained on site and be made available to the permitting authority upon request;

(ii) In the site log book, the permittee shall certify, prior to the commencement of construction activities, that any plans required by the permit meet all Federal, State, Tribal and local erosion and sediment control requirements and are available to the permitting authority;

(iii) The permittee shall have a qualified professional (knowledgeable in the principles and practices of erosion and sediment controls, such as a licensed professional engineer, or other knowledgeable person) conduct an assessment of the site prior to groundbreaking and certify in the log book that the appropriate best management practices (BMPs) described in plans required by the permit have been adequately designed, sized and installed to ensure overall preparedness of the site for initiation of groundbreaking activities. The permittee shall record the date of initial groundbreaking in the site log book. The permittee shall also certify that any inspection, stabilization and BMP maintenance requirements of the permit have been satisfied within 48 hours of actually meeting such requirements; and

(iv) The permittee shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis;

(2) *Site Inspections.* The permittee or designated agent of the permittee (such as a consultant, subcontractor, or third-party inspection firm) shall conduct regular inspections of the site and record the results of such inspection in the site log book in accordance with paragraph (t)(1) of this section.

(i) After initial groundbreaking, permittees shall conduct site inspections at least every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. These inspections shall be conducted by a qualified professional. During each inspection, the permittee or designated agent shall record the following information:

(A) Indicate on a site map the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14 days;

(B) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(C) Indicate all disturbed site areas that have not undergone active site work during the previous 14 days;

(D) Inspect all sediment control practices and note the approximate degree of sediment accumulation as a percentage of the sediment storage volume (for example 10 percent, 20 percent, 50 percent, etc.). Note all sediment control practices in the site log book that have sediment accumulation of 50 percent or more; and

(E) Inspect all erosion and sediment control BMPs and note compliance with any maintenance requirements such as verifying the integrity of barrier or diversion systems (e.g., earthen berms or silt fencing) and containment systems (e.g., sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document in the site log book any excessive deposition of sediment or ponding water along barrier or diversion systems. Note the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water.

(ii) Prior to filing of the Notice of Termination or the end of permit term, a final site erosion and sediment control

inspection shall be conducted by the permittee or designated agent. The inspector shall certify that the site has undergone final stabilization as required by the permit and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

[Option 2]

Part 122 is proposed to be amended and part 450 is proposed to be added to read as follows:

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Section 122.44 is amended by revising paragraph (i)(3) as follows:

§ 122.44 Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs, see § 123.25).

* * * * *

(i) * * *

(3) Requirements to report monitoring results for storm water discharges associated with industrial activity, with the exception of construction activity as defined in § 122.26(b)(14)(x), that are subject to an effluent limitation guideline shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once a year. Discharges from construction activity pursuant to § 122.26(b)(14)(x) shall be governed instead by 40 CFR part 450.

3. A new part 450 is added to read as follows:

PART 450—CONSTRUCTION AND DEVELOPMENT POINT SOURCE CATEGORY

Subpart A—General Provisions

Sec.

Subpart B—Erosion and Sediment Controls

Authority: Sections 301, 304, 306, 308, 402, and 501 of the Clean Water Act, as amended; 33 U.S.C. 1311, 1314, 1316, 1318, 1342, and 1361.

Subpart A—General Provisions

§ 450.10 Applicability.

This part applies to any point source discharges from construction and development activities that are subject to an NPDES permit under the definition of "construction activity" at 40 CFR 122.26(b)(14)(x). This may include, but is not restricted to, construction of residential buildings and non-residential buildings, and heavy construction (including highways and streets, bridges and tunnels, pipelines, transmission lines and industrial non-building structures). Where there is more than one operator of a discharge at a site, the requirements of this part may be shared among operators if all the requirements of this part are met for the entire site. The Storm Water Pollution Prevention Plan (SWPPP) required by § 450.21(d) shall clearly delineate the responsibilities of all operators.

§ 450.11 General definitions.

In addition to the definitions set forth in 40 CFR 122.2, 122.26(b) and 40 CFR 401.11, the following definitions apply to this part:

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Commencement of construction means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

Final stabilization means that either:

(1) All soil-disturbing activities at the site have been completed and a uniform (e.g, evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed; or

(2) For individual lots in residential construction by either: The homebuilder completing final stabilization as specified above; or the homebuilder establishing temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization; or

(3) For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Disturbed areas that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "waters of the United States," and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization criteria in paragraph (1) or (2) of this definition.

Groundbreaking means the commencement of construction activity at a site.

New Source means any source from which there may be a discharge associated with construction activity pursuant to 40 CFR 122.26(b)(14)(x) that will result in a building, structure, facility or installation from which there may be a discharge of pollutants regulated by new source performance standards elsewhere under subchapter N.

Operator for the purpose of this Part and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

(1) The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

(2) The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a storm water pollution prevention plan (SWPPP) for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP required by § 450.21(d) or to comply with other permit conditions).

Perimeter controls means best management practices that are designed to prevent uncontrolled discharge of sediment from the site. Perimeter controls include BMPs such as diversion dikes, storm drain inlet protection, berms, and silt fencing.

Qualified professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer, or other knowledgeable person.

Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Stabilization means covering or maintaining an existing cover over soil. Cover can be vegetative (e.g., grass, trees, seed and mulch, shrubs, or turf) or non-vegetative (e.g., geotextiles, riprap, or gabions).

Subpart B—Erosion and Sediment Control

§450.21 Effluent limitations reflecting the best practicable technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of the best practicable control technology currently available (BPT). Permittees with operational control over construction plans and specification, including the ability to make modifications to those plans and specifications (e.g., developer or owner), must ensure the project specifications that they develop meet the minimum requirements of a SWPPP required by paragraph (d) of this section.

(a) *General Erosion and Sediment Controls.* Each SWPPP shall include a description of appropriate controls designed to retain sediment on site to the extent practicable. These general erosion and sediment controls shall be included in the SWPPP developed pursuant to paragraph (d) of this section. The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Stabilization practices may include:

(1) Establishment of temporary or permanent vegetation;

(2) Mulching, geotextiles, or sod stabilization;

(3) Vegetative buffer strips;

(4) Protection of trees and preservation of mature vegetation.

(b) *Sediment controls.* The SWPPP must include a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable.

(1) For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2 year, 24-hour storm from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location it is not necessary to include flows from off-site areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin.

(2) In determining whether a sediment basin is attainable, the operator may consider factors such as site soils, slope, available area on site, etc. In any event, the operator must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment controls shall be used where site limitations would preclude a safe basin design.

(3) For portions of the site that drain to a common location and have a total contributing drainage area of less than 10 disturbed acres, the operator should use smaller sediment basins and/or sediment traps.

(4) Where neither a sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(c) *Pollution Prevention Measures.* The SWPPP shall include the following pollution prevention measures:

(1) Litter, construction chemicals, and construction debris exposed to storm water shall be prevented from becoming a pollutant source in storm water discharges (e.g., screening outfalls, picked up daily); and

(2) A description of construction and waste materials expected to be stored on-site with updates as appropriate, and a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention and response.

(d) *Storm Water Pollution Prevention Plan.* Operators subject to this part shall compile Storm Water Pollution Prevention Plans (SWPPPs) prior to groundbreaking at any construction site. In areas where EPA is not the permit authority, operators may be required to prepare documents that may serve as the functional equivalent of a SWPPP. Such alternate documents will satisfy the requirements for a SWPPP so long as they contain the necessary elements of a SWPPP. A SWPPP shall incorporate the following information:

(1) A narrative description of the construction activity, including a description of the intended sequence of major activities that disturb soils on the site (major activities include grubbing, excavating, grading, and utilities and infrastructure installation, or any other activity that disturbs soils for major portions of the site);

(2) A general location map (e.g., portion of a city or county map) and a site map. The site map shall include descriptions of the following:

(i) Drainage patterns and approximate slopes anticipated after major grading activities;

(ii) The total area of the site and areas of disturbance;

(iii) Areas that will not be disturbed;

(iv) Locations of major structural and nonstructural controls identified in the SWPPP;

(v) Locations where stabilization practices are expected to occur;

(vi) Locations of off-site material, waste, borrow or equipment storage areas;

(vii) Surface waters (including wetlands); and

(viii) Locations where storm water discharges to a surface water;

(3) A description of available data on soils present at the site;

(4) A description of BMPs to be used to control pollutants in storm water discharges during construction as described elsewhere in this section;

(5) A description of the general timing (or sequence) in relation to the construction schedule when each BMP is to be implemented;

(6) An estimate of the pre-development and post-construction runoff coefficients of the site;

(7) The name(s) of the receiving water(s);

(8) Delineation of SWPPP implementation responsibilities for each site owner or operator;

(9) Any existing data that describe the storm water runoff characteristics at the site.

(e) *Updating the SWPPP.* The operator shall amend the SWPPP and corresponding erosion and sediment control BMPs whenever:

(1) There is a change in design, construction, or maintenance that has a significant effect on the discharge of pollutants to waters of the United States which has not been addressed in the SWPPP; or

(2) Inspections or investigations by site operators, local, State, Tribal or

Federal officials indicate that the SWPPP is proving ineffective in eliminating or significantly minimizing pollutant discharges.

(f) *Site Log Book/Certification.* The operator shall maintain a record of site activities in a site log book, as part of the SWPPP. The site log book shall be maintained as follows:

(1) A copy of the site log book shall be maintained on site and be made available to the permitting authority upon request;

(2) In the site log book, the operator shall certify, prior to the commencement of construction activities, that the SWPPP prepared in accordance with paragraph (d) of this section meets all Federal, State and local erosion and sediment control requirements and is available to the permitting authority;

(3) The operator shall have a qualified professional conduct an assessment of the site prior to groundbreaking and certify in the log book that the appropriate BMPs and erosion and sediment controls described in the SWPPP and required by paragraphs (a), (b), (c) and (d) of this section have been adequately designed, sized and installed to ensure overall preparedness of the site for initiation of groundbreaking activities. The operator shall record the date of initial groundbreaking in the site log book. The operator shall also certify that the requirements of paragraphs (g), (h) and (i) of this section have been satisfied within 48 hours of actually meeting such requirements;

(4) The operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.

(g) *Site Inspections.* The operator or designated agent of the operator (such as a consultant, subcontractor, or third-party inspection firm) shall conduct regular inspections of the site and record the results of such inspection in the site log book in accordance with paragraph (f) of this section.

(1) After initial groundbreaking, operators shall conduct site inspections at least every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. These inspections shall be conducted by a qualified professional. During each inspection, the operator or designated agent shall record the following information:

(i) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(ii) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(iii) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(iv) Inspect all sediment control practices and note the approximate degree of sediment accumulation as a percentage of the sediment storage volume (for example 10 percent, 20 percent, 50 percent, etc.). Record all sediment control practices in the site log book that have sediment accumulation of 50 percent or more; and

(v) Inspect all erosion and sediment control BMPs and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document in the site log book any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water.

(2) Prior to filing of the Notice of Termination or the end of permit term, a final site erosion and sediment control inspection shall be conducted by the operator or designated agent. The inspector shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

(h) *Stabilization.* The operator shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instances:

(1) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;

(2) Where construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within 21 days, temporary stabilization measures need not be initiated on that portion of the site.

(3) In arid areas (areas with an average annual rainfall of 0 to 10 inches), semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, the operator shall initiate stabilization measures as soon as practicable.

(i) *Maintenance.* Sediment shall be removed from sediment traps or sediment ponds when design capacity has been reduced by 50 percent.

§ 450.22 Effluent limitations reflecting the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must employ the best management practices (BMPs) in this section, representing the application of the best available technology economically achievable (BAT): The effluent limitations are the same as those specified in § 450.21.

§ 450.23 Effluent limitations reflecting the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must employ the best management practices (BMPs) in this section, representing the application of the best conventional pollutant control technology (BCT): The effluent limitations are the same as those specified in § 450.21.

§ 450.24 New source performance standards (NSPS).

Any new source subject to this subpart must achieve new source performance standards (NSPS): The effluent limitations are the same as those specified in § 450.21.

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MENU OF MANAGEMENT PROGRAM OPTIONS

Construction Site Storm Water Runoff Control
Final Draft

The following "Menu of Management Program Options" has been developed from a number of sources, including suggestions by Regional Program participants at the Construction Site Runoff Control Workshops, local erosion and sediment control ordinances, EPA documents, and others. Participants may consider these options in the process of developing the construction component of their municipal storm water management plan.

These suggestions do not represent the complete universe of alternatives available, nor do they represent an attempt to present a packaged storm water management plan. It is the responsibility of each city or county to develop a complete storm water management plan that meets the regulatory requirements. Consider the regulatory goal of "maximum extent practicable" (MEP) when developing your storm water management plan and realize that implementation of the plan and related ordinances becomes a condition of your storm water permit. Prepare a plan that is functional and can be implemented effectively in your jurisdiction.

The italicized text included below is the language for the "Construction Site Storm Water Runoff Control" Minimum Measure taken from EPA's Final Phase II Rule. The Final Phase II Rule establishes the minimum requirements that TNRCC will use in drafting the corresponding storm water permit for small municipalities in Texas. Cities and counties should use these requirements in planning their storm water management programs until TNRCC issues the Texas permit (TNRCC must issue the Phase II municipal storm water permit by December 9, 2002).

"Your NPDES MS4 permit will require at a minimum that you develop, implement and enforce a storm water management program designed to reduce the discharge of pollutants from your MS4 to the maximum extent practicable (MEP) [and] to protect water quality...Your storm water management program must include the [following] minimum control measures..."

"Construction site storm water runoff control. (i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more."

"(ii) Your program must include the development and implementation of, at a minimum:"

"(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;"

Note: For organizational purposes, this section will primarily cover policy and procedural elements of the ordinance. Technical requirements imposed by the ordinance are covered under other sections.

Coordination with Federal/State Construction Permits and NCTCOG Regional Program

- Require NPDES or TPDES construction permit coverage as part of ordinance and require copy of Notice of Intent to be filed with MS4 operator
- Establish that a violation of an NPDES or TPDES construction permit is a violation of the local ordinance
- Establish local minimum training requirements and require contractors to submit qualifications of individuals with responsibility for inspection and maintenance of storm water pollution prevention best management practices
- Require usage of best management practices (BMPs) detailed in the NCTCOG Construction BMP Manual
- Require NCTCOG Construction BMP Manual recommended 70% site rating (E&S plan designed to retain a minimum of 70% of potential sediment loss)

Local Permit Options

Note: The Phase II MS4 storm water regulations do not specifically require cities/counties to have a local permit for earth disturbing activities; however a permit system may help in tracking clearing and grading activities.

- Require a grading permit for any earth disturbing or filling activities; and/or
- Require a building permit for any construction (including grading) or demolition activities

Discharge Prohibition

- Prohibit all non-storm water discharges (except those allowed by EPA/TNRCC) from the site under development; and/or
- Prohibit sediment, trash, or debris from leaving the site under development; and/or
- Prohibit sediment, trash, or debris from entering the MS4 (including streets) and receiving waters as a result of construction activities on a property

Sanctions for Noncompliance

Note: Provide for escalating levels of sanctions depending on severity of violation and repeated failure of operator to correct identified deficiencies (warnings, fines, stop work orders, etc.)

- Require posting of bond (or deposit) to cover cost of restoration/final stabilization if operator defaults; and/or
- Establish procedures for issuance of warning notice of violation (with no fine associated) for first time offense; and/or
- Establish provisions for fines for violations, with each day of noncompliance constituting a separate offense; and/or
- Establish provisions to issue stop-work orders; and/or
- Establish provisions for the local government to correct violations and charge the offender for reimbursement of costs incurred; and/or
- Establish provisions for the local government to take out a lien against the property to recover expenses to correct violations; and/or
- Establish provisions to deny further permit approvals or project authorizations to non-complying developers or contractors

Residential Subdivision Issues

- Incorporate requirement in subdivision regulations for developers and contractors to comply with state and federal construction storm water permit rules (particularly useful for counties with limited enforcement authority)

- Require the developer to post an erosion control deposit for each lot in a residential development (Plano)
- Require final stabilization of all disturbed ground prior to acceptance of infrastructure
- Require the land developer to maintain temporary and permanent erosion and sediment controls on all lots for which a building permit has not been issued (unless entire project transferred to one builder who would then assume the responsibility)
- Require the land developer to maintain all temporary and permanent erosion and sediment controls not associated with individual lots (inlet protection, sediment basins, common areas, etc.) until the subdivision is built-out or the project is transferred to one builder who would then assume the responsibility for BMP maintenance
- Require that all utilities be in place prior to acceptance of infrastructure
- Require individual purchasers of new homes to establish final stabilization if not conducted by homebuilder

"(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices"

Note: These requirements can be included in the erosion and sediment control ordinance, or may be implemented by other procedural means such as engineering or drainage standards.

Erosion and Sediment Control Plan

- Require submission and approval of an erosion and sediment control (E&S) plan prior to earth disturbing activities; and/or
- Require submission of the Storm Water Pollution Prevention Plan (SWPPP) specified by the NPDES or TPDES construction permit
- Require E&S plan (or SWPPP) to be prepared by an individual with appropriate credentials (erosion control certification, licensed engineer or landscape architect, etc.)
- Require E&S plan (or SWPPP) to reflect different phases of construction (clearing, grading, infrastructure, building, completion/landscaping)
- Require E&S plan (or SWPPP) to note sequence of construction/installation of BMPs
- Provide a checklist to developers, engineers, and contractors with specific erosion and sediment control plan requirements

Best Management Practices

- Require BMPs to be installed and maintained as specified in the NCTCOG Construction BMP Manual (or TPWA, ASCE, etc.)
- Require disturbed area to be limited to the greatest extent possible
- Require specific approval and permanent stabilization measures for cut/fill slopes over 3:1
- Require local approval for temporary stream crossings and construction activities in waterways (in addition to any required Army Corps of Engineers approval)
- Require velocity dissipation for water or fire line flushing operations

Practices for Individual Residential Lots

- Require a "limited" or "generic" erosion and sediment control plan as a condition of issuing a building permit
- Require a minimum of 8' (or other appropriate width) of erosion control matting around downslope perimeter of lot or adjacent to curb face and drainage swales

"(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality"

Waste Management Plans/Procedures

- Require usage of best management practices (BMPs) detailed in the NCTCOG Construction BMP Manual (or TPWA, ASCE, etc.)
- Require locations of waste containers, concrete washout facilities, chemical storage areas, refueling areas, sanitary facilities, and chlorinated water treatment facilities to be shown on appropriate plans (construction, E&S, SWPPP, etc.)
- Require waste collection areas to be located such that they do not receive substantial runoff from upland areas and do not drain directly to the MS4 (including streets) or receiving waters
- Require sanitary waste facilities (portable toilets) to be located a specified minimum distance (~10 to 20 feet) away from storm drain inlets and receiving waters; and/or
- Require containment for sanitary waste facilities (portable toilets)
- Require management of chlorinated water discharge from water line sanitation operations to provide for dissipation of chlorine (and velocity) prior to discharge to MS4 or receiving waters (sheet flow over vegetation, spray irrigation over vegetation, temporary impoundment, etc.)
- Provide a checklist to developers, engineers, and contractors with waste management plan requirements
- Audit facilities that collect waste materials from construction sites to ensure they are not dumping illegally

Hazardous Waste Management

- Require chemicals, paint, petroleum, fertilizer, and pesticide to be stored in a covered enclosure
- Require above ground petroleum storage tanks to be placed in a bermed enclosure
- Require disposal of empty/unused chemical containers in accordance with label instructions (or provide more detailed local instructions)
- Require segregation of potentially hazardous and non-hazardous wastes
- Require spill control procedures and notification of spills to the MS4

Construction Waste and Trash Management

- Require appropriate waste containers that prohibit pollutant runoff
- Require daily cleanup of construction site and placement of all waste and trash in approved containers
- Require disposal of all construction site wastes at authorized disposal facilities
- Require (or encourage) recycling of appropriate waste construction materials (Frisco)

"(D) Procedures for site plan review which incorporate consideration of potential water quality impacts"

Development Review Committee

- Implement a Development Review Committee to review applicable plans to ensure compliance with erosion and sediment/waste control requirements for all public and private construction projects

- Development Review Committee composition could include staff from engineering, public works, and environmental management as appropriate
- Require a tree survey (if a tree ordinance is in place) to be included in the development plans

Pre-construction Meeting

- Require a pre-construction meeting for all public and private projects to outline sediment and erosion/waste control requirements to the developer and contractors
- Include inspector with responsibility for storm water inspection for the project in the pre-construction meeting
- Provide an information packet outlining storm water program requirements to developers and contractors

Education/Training for Developers, Builders, and Contractors

- Conduct periodic meetings to educate companies involved in public and private construction in the jurisdiction on local pollution prevention requirements and procedures

"(E) Procedures for receipt and consideration of information submitted by the public"

Complaint Response

- Establish a "hotline" phone number for citizen complaints (NCTCOG could establish regional hotline)
- Establish a maximum time to investigate and report back to person making complaint
- Establish procedures for recordkeeping of complaints and corrective actions taken
- Incorporate response to citizen complaints into the construction inspection process

"(F) Procedures for site inspection and enforcement of control measures"

Organization

- Use existing inspection organizations (engineering, public works, building) and incorporate inspection of erosion and sediment/waste controls into their normal functions; or
- Create a storm water or environmental management department with sole or primary responsibility for erosion and sediment/waste control inspections

Training and Materials

- Provide training to all personnel involved in construction inspection and enforcement on inspection of storm water pollution prevention practices for construction
- Provide training to other personnel to recognize erosion and sediment control problems and report to appropriate department
- Provide a standard form with all inspection requirements for use on inspections

Inspection Frequency/Notification Requirements

- Establish appropriate frequencies for inspection of construction storm water BMPs for different types of development: residential subdivision infrastructure construction (once per week or two weeks, and/or at other required inspections); single family residence (at each code inspection); commercial construction (clearing, grading, code inspections); and/or
- Establish a general frequency of inspection of all active construction sites (i.e. all sites inspected at least once per month); and/or

- Establish priorities for inspections of construction sites depending on probable impact (size or type of development, proximity to sensitive receiving waters, etc.)
- Conduct inspections in response to observations by local government personnel or citizen complaints
- Require notification from contractor prior to start or on completion of various stages of construction (filing of NOI, start of clearing, completion of installation of BMPs, completion of clearing, completion of grading, completion of final landscaping, filing of NOT, etc)

Procedures

- Establish procedures for notifying operators of violations and required corrective actions depending on the type of violation
- Establish allowable time for corrective action depending on severity of actual or likely impact on receiving waters as a result of violation
- Establish procedures for recordkeeping of inspections and compliance actions

Enforcement

Note: These measures can be used in addition to the sanctions included in the ordinance section above.

- Withhold payment on public projects (authority may need to be provided for in contract documents)
- Withhold building, plumbing, electrical, etc. inspection approvals (authority may need to be provided for in building ordinance) until corrective measures are completed
- Utilize litter, health, nuisance or other related ordinance authority to require cleanup of construction sites

Excerpt from Georgia Stormwater Management Manual
The complete document is available at
www.georgiastormwater.com

CHAPTER

4

IMPLEMENTING STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT

4.1 Overview

Adoption of a comprehensive and integrated set of stormwater management requirements for new development and redevelopment projects is one of the key components of a comprehensive local stormwater management program. Performance requirements and minimum standards for controlling runoff from development are critical to addressing both the water quantity and quality impacts of post-construction urban stormwater and are a required component of NPDES municipal stormwater programs.

Minimum stormwater management standards must also be supported by a set of design and management tools and an integrated design approach for implementing both structural and nonstructural stormwater controls. The following elements of a local toolbox for addressing development activities are described in this chapter:

- Stormwater Better Site Design – The first step in addressing stormwater management begins with the site planning and design process. The goal of better site design is to reduce the amount of runoff and pollutants that are generated from a development site and provide for some nonstructural on-site treatment and control of runoff by implementing a combination of approaches collectively known as *stormwater better site design practices*. These include maximizing the protection of natural features and resources, developing a site design which minimizes impact, reducing overall site imperviousness, and utilizing natural systems for stormwater management.
- Unified Stormwater Sizing Criteria – An integrated set of design criteria for stormwater quality and quantity management which addresses the entire range of hydrologic events. These criteria allows the site engineer to calculate the stormwater control volumes required for water quality, downstream channel protection, and overbank and extreme flood protection.
- Stormwater Credits for Better Site Design – A set of stormwater "credits" can be used to provide developers and site designers an incentive to implement better site design practices that can reduce the volume of stormwater runoff and minimize the pollutant loads from a site. The credit system directly translates into cost savings to the developer by reducing the size of structural stormwater control and conveyance facilities.
- Downstream Assessments – Peak flow downstream assessments can be required to ensure that a proposed development is not adversely impacting downstream properties after the stormwater management requirements have been addressed. These assessments can also potentially be used to waive the need for detention for overbank and extreme flood control.
- Guidance on Structural Stormwater Controls – This Manual recommends a set of structural stormwater controls that can be used to meet stormwater management water quantity and quality goals. Specific technical guidance on how to select, size, design, construct and maintain structural controls (as provided in Volume 2) must be provided by a community in requiring the use of structural measures.

- Stormwater Management Site Plans – Communities can require the preparation of a *stormwater management site plan* for development activities. A stormwater site plan is a comprehensive report that contains the technical information and analysis to allow a local review authority to determine whether a proposed new development or redevelopment project meets the local stormwater regulatory requirements.

Figure 4.1-1 illustrates how these design tools would be used in the development process to address the local stormwater management requirements.

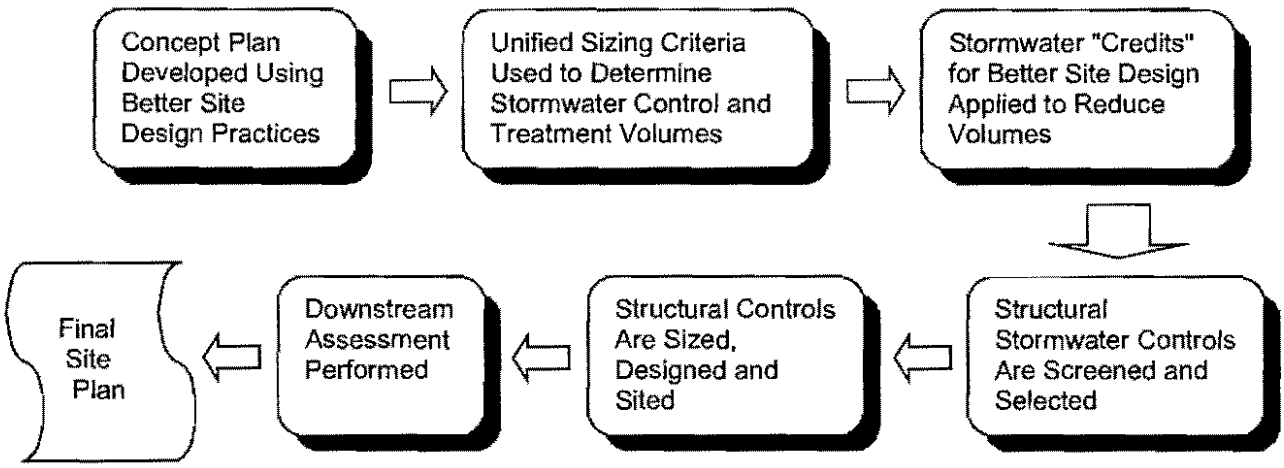


Figure 4.1-1 Typical Stormwater Management System Design Process

4.2 Minimum Standards for Development

4.2.1 Introduction

This section presents a comprehensive set of minimum performance standards for stormwater management for development activities. These recommended standards provide Georgia communities with an integrated approach to address both the water quality and quantity problems associated with stormwater runoff due to urban development. They are designed to assist local governments in complying with regulatory and programmatic requirements for various state and Federal programs including the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program and the National Flood Insurance Program under FEMA.

These minimum standards are ideally built into a community's development ordinances and supported by the plan review process. They may be adopted by local jurisdictions as stormwater management development requirements and/or may be modified to meet local or watershed-specific stormwater management goals and objectives.

The goal of stormwater management requirements for areas of new development and significant redevelopment is to reduce the impact of post-construction stormwater runoff on the watershed. This can be achieved by (1) maximizing the use of site design and nonstructural methods to reduce the generation of runoff and pollutants; (2) managing and treating stormwater runoff though the use of structural stormwater controls; and (3) implementing pollution prevention practices to limit potential stormwater contaminants. The minimum stormwater management standards presented here incorporate these concepts and cover the entire cycle of development from site planning through long-term maintenance of stormwater management facilities.

4.2.2 Applicability

It is recommended that the stormwater management standards listed below be required for any new development and redevelopment site that meets one or more of the following criteria:

(1) New development that includes the creation or addition of 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 5,000 square feet of land or greater.
(2) Redevelopment that includes the creation or addition of 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 1 acre or more.
(3) Any commercial or industrial new development or redevelopment, regardless of size, with a Standard Industrial Classification (SIC) code that falls under the NPDES Industrial Stormwater Permit program, or a hotspot land use as defined below.

In addition, redevelopment sites that involve land disturbing activity of 5,000 square feet or greater, but less than 1 acre, are required to meet Minimum Standard 8 (to meet state and NPDES construction erosion and sediment control requirements) and should be required to meet Minimum Standards 2, 9 and 10 to the maximum extent practicable.

Definitions

New development is defined as land disturbing activities, structural development (construction, installation or expansion of a building or other structure), and/or creation of impervious surfaces on a previously undeveloped site.

Redevelopment is defined as structural development (construction, installation or expansion of a building or other structure), creation or addition of impervious surfaces, replacement of impervious surface not part of routine maintenance, and land disturbing activities associated with structural or impervious development. Redevelopment does not include such activities as exterior remodeling.

A *hotspot* is defined as a land use or activity on a site that produces higher concentrations of trace metals, hydrocarbons or other priority pollutants than are normally found in urban stormwater runoff. Examples of hotspots include gas stations, vehicle service and maintenance areas, salvage yards, material storage sites, garbage transfer facilities, and commercial parking lots with high-intensity use.

Exemptions

The following development activities are suggested to be exempted from the minimum stormwater management standards:

(1) Developments that do not disturb more than 5,000 square feet of land;
(2) Individual single family residential lots. (Single family lots that are part of a subdivision or phased development project should not be exempt from the minimum standards); and
(3) Additions or modifications to existing single-family structures

Additional Requirements

New development or redevelopment in critical or sensitive areas, or as identified through a watershed study or plan, may be subject to additional performance and/or regulatory criteria. Furthermore, these sites may need to utilize or restrict certain structural controls in order to protect a special resource or address certain water quality or drainage problems identified for a drainage area.

Note: These Georgia-specific standards serve as one example of an approach to comprehensive storm water management that could be adopted for use in North Central Texas.

4.2.3 Minimum Stormwater Management Standards

The following standards are the recommended minimum stormwater management performance requirements for new development or redevelopment sites falling under the applicability criteria above.

(The word "shall" in brackets is provided for local jurisdictions that wish to adopt these standards as part of their stormwater management ordinances)

A detailed technical explanation of each minimum standard is provided in Volume 2, Section 1.2.

- **Minimum Standard #1 – Use of Better Site Design Practices for Stormwater Management**

  Site designs should preserve the natural drainage and treatment systems and reduce the generation of additional stormwater runoff and pollutants to the fullest extent practicable.

- **Minimum Standard #2 – Stormwater Runoff Quality**

  All stormwater runoff generated from a site should [shall] be adequately treated before discharge. Stormwater management systems (which can include both structural stormwater controls and better site design practices) should [must] be designed to remove 80% of the average annual post-development total suspended solids (TSS) load and be able to meet any other additional watershed- or site-specific water quality requirements.

  It is presumed that a stormwater management system complies with this performance standard if:

  - It is sized to capture and treat the prescribed water quality treatment volume, which is defined as the runoff volume resulting from the first 1.2 inches of rainfall from a site; and
  - Appropriate structural stormwater controls are selected, designed, constructed, and maintained according to the specific criteria in this Manual.
  - Runoff from hotspot land uses and activities is adequately treated and addressed through the use of appropriate structural stormwater controls and pollution prevention practices.

- **Minimum Standard #3 – Stream Channel Protection**

  Stream channel protection should [shall] be provided by using all of the following three approaches: (1) 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event; (2) erosion prevention measures such as energy dissipation and velocity control; and (3) preservation of the applicable stream buffer.

- **Minimum Standard #4 – Overbank Flood Protection**

  Downstream overbank flood protection should [shall] be provided by controlling the post-development peak discharge rate to the predevelopment rate for the 25-year, 24-hour return frequency storm event. If control of the 1-year, 24-hour storm (Minimum Standard #3) is exempted, then overbank flood protection should [shall] be provided by controlling the post-development peak discharge rate to the predevelopment rate for the 2-year through the 25-year return frequency storm events.

- **Minimum Standard #5 – Extreme Flood Protection**

  Extreme flood protection should [shall] be provided by controlling and/or safely conveying the 100-year, 24 hour return frequency storm event such that flooding is not exacerbated. Existing and future floodplain areas should be preserved as possible.

- **Minimum Standard #6 – Downstream Analysis**

  A downstream hydrologic analysis should [shall] be performed to determine if there are any additional impacts in terms of peak flow increase or downstream flooding while meeting Minimum Standards #1 through 5. This analysis should [shall] be performed at the outlet(s) of the site, and downstream at each tributary junction to the point(s) in the conveyance system where the area of the portion of the site draining into the system is less than or equal to 10% of the total drainage area above that point.

- **Minimum Standard #7 – Groundwater Recharge**

  Annual groundwater recharge rates should be maintained to the extent practicable through the use of nonstructural methods.

- **Minimum Standard #8 – Construction Erosion and Sedimentation Control**

  Erosion and sedimentation control practices shall be utilized during the construction phase or during any land disturbing activities.

- **Minimum Standard #9 – Stormwater Management System Operation and Maintenance**

  The stormwater management system, including all structural stormwater controls and conveyances, should [shall] have an operation and maintenance plan to ensure that it continues to function as designed.

- **Minimum Standard #10 – Pollution Prevention**

  To the maximum extent practicable, the development project should [shall] implement pollutant prevention practices and have a stormwater pollution prevention plan.

- **Minimum Standard #11 – Stormwater Management Site Plan**

  The development project should [shall] prepare a stormwater management site plan for local government review that addresses Minimum Standards #1 through 10.

4.3 Stormwater Better Site Design Practices

4.3.1 Introduction

The first step in addressing stormwater management begins with the site planning and design process. Development projects can be designed to reduce their impact on watersheds when careful efforts are made to conserve natural areas, reduce impervious cover and better integrate stormwater treatment. By promoting a combination of these nonstructural approaches collectively known as *stormwater better site design practices*, a community can help developers reduce the amount of runoff and pollutants that are generated from a development or redevelopment site and provide for some nonstructural on-site treatment and control of runoff. The goals of better site design include:

- Managing stormwater (quantity and quality) as close to the point of origin as possible and minimizing collection and conveyance
- Preventing stormwater impacts rather than mitigating them
- Utilizing simple, nonstructural methods for stormwater management that are lower cost and lower maintenance than structural controls
- Creating a multifunctional landscape
- Using hydrology as a framework for site design

Better site design for stormwater management includes a number of site design techniques such as preserving natural features and resources, effectively laying out the site elements to reduce impact, reducing the amount of impervious surfaces, and utilizing natural features on the site for stormwater management. The aim is to reduce the environmental impact "footprint" of the site while retaining and enhancing the owner/developer's purpose and vision for the site. Many of the better site design concepts can reduce the cost of infrastructure while maintaining or even increasing the value of the property.

Better site design concepts can be viewed as both water quantity and water quality management tools and can reduce the size and cost of required structural stormwater controls—sometimes eliminating the need for them entirely. The site design approach can result in a more natural and cost-effective stormwater management system that better mimics the natural hydrologic conditions of the site, has a lower maintenance burden and provides for more sustainability.

4.3.2 Suite of Stormwater Better Site Design Practices

Listed below are the stormwater better site design practices and techniques recommended in this Manual. Each of the practices listed here are covered in more detail with examples in Volume 2, Section 1.5. Figures 4.3-1 and 4.3-2 illustrate the use of some of these better site design principles for a residential and office park example, respectively.

Conservation of Natural Features and Resources

The first step in the better site design process is to identify and preserve the natural features and resources that can be used in the protection of water resources by reducing stormwater runoff, providing runoff storage, reducing flooding, preventing soil erosion, promoting infiltration, and removing stormwater pollutants. Some of the natural features that should be taken into account include:

- Areas of undisturbed vegetation
- Floodplains and riparian areas
- Ridgetops and steep slopes
- Natural drainage pathways
- Intermittent and perennial streams
- Aquifers and recharge areas
- Wetlands
- Soils
- Other natural features or critical areas

Delineation of natural features is typically done through a comprehensive site analysis and inventory before any site layout design is performed. Approaches that should be followed in conserving natural features and resources include:

- Preserving Undisturbed Natural Areas
- Preserving Riparian Buffers
- Avoiding Floodplains
- Avoiding Steep Slopes
- Minimizing Siting on Porous or Erodible Soils

Lower Impact Site Design Techniques

After conservation areas have been delineated, there are additional opportunities in the preliminary stages of a site design for avoiding downstream impacts from the development. These primarily deal with the location and configuration of lots or structures on the site and include the following recommendations and options:

- Fitting the Design to the Terrain
- Reducing the Limits of Clearing and Grading
- Locating Development in Less Sensitive Areas
- Utilizing Open Space Development and/or Nontraditional Lot Designs for Residential Areas
- Considering Creative Development Design

Reduction of Impervious Cover

Reducing the area of total impervious surface on a site directly reduces the volume of stormwater runoff and associated pollutants that are generated. It can also reduce the size and cost of necessary infrastructure. Some of the ways that impervious cover can be reduced in a development include:

- Reducing Roadway Lengths
- Reducing Roadway Widths
- Reducing the Footprint of Buildings
- Reducing the Parking Footprint
- Reducing Setbacks and Frontages
- Fewer or Alternative Cul-de-sacs

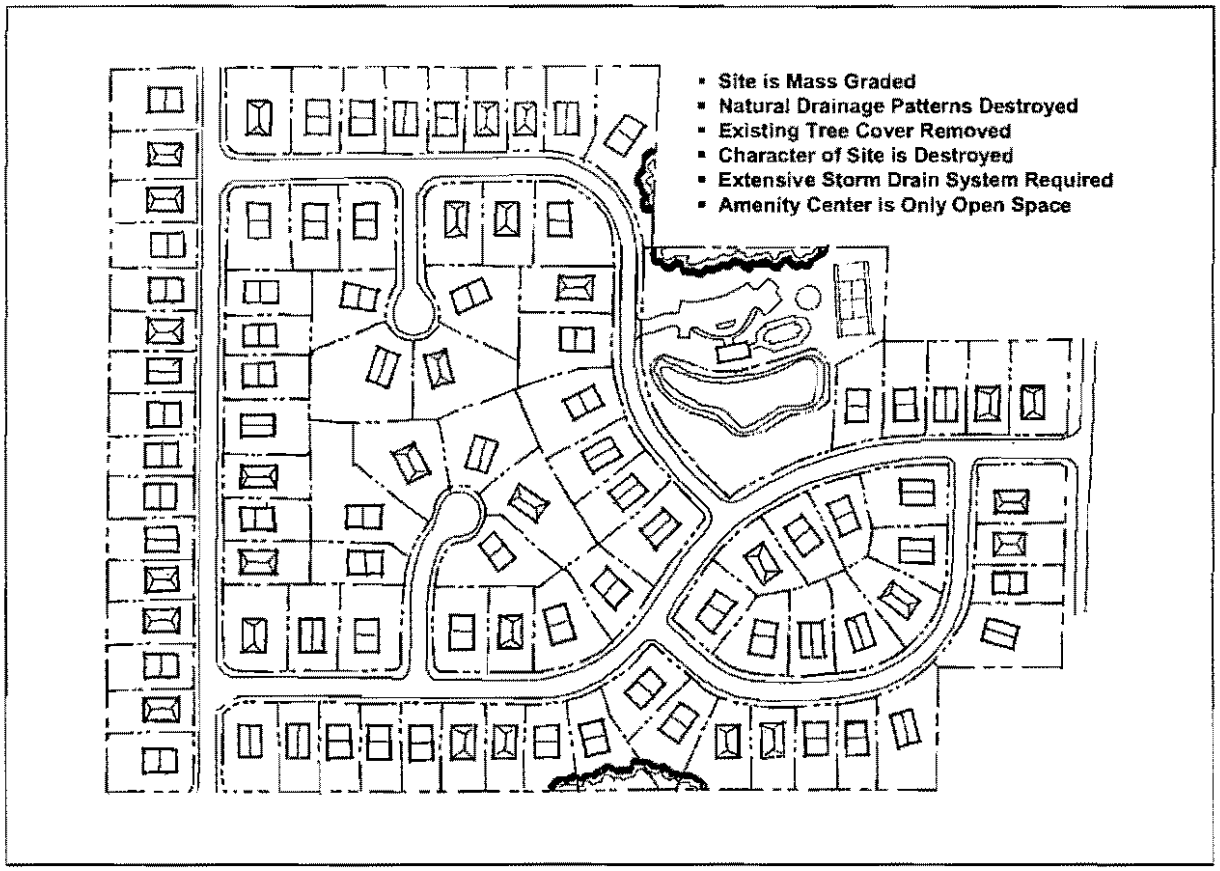
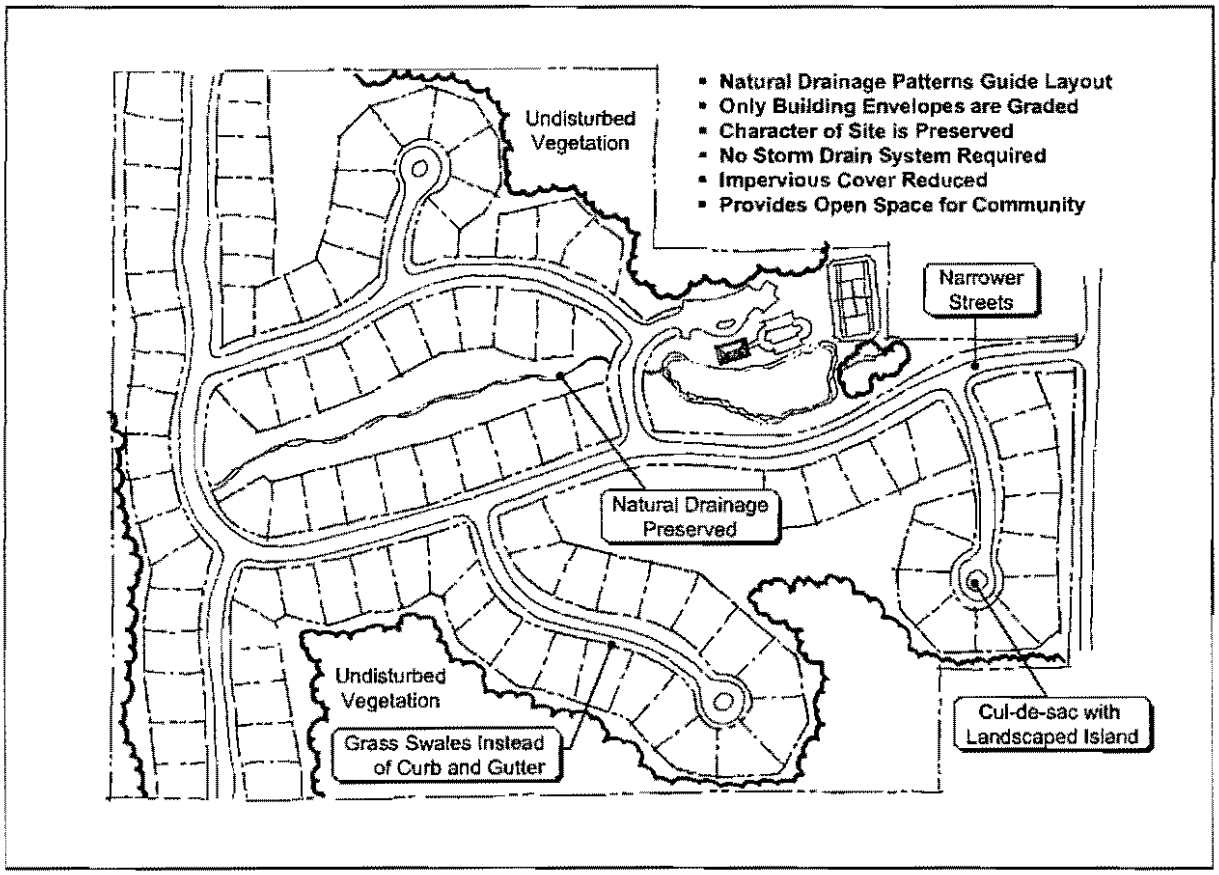


Figure 4.3-1 Comparison of a Traditional Residential Subdivision Design (above) and an Innovative Site Plan Developed Using Better Site Design Practices (below).



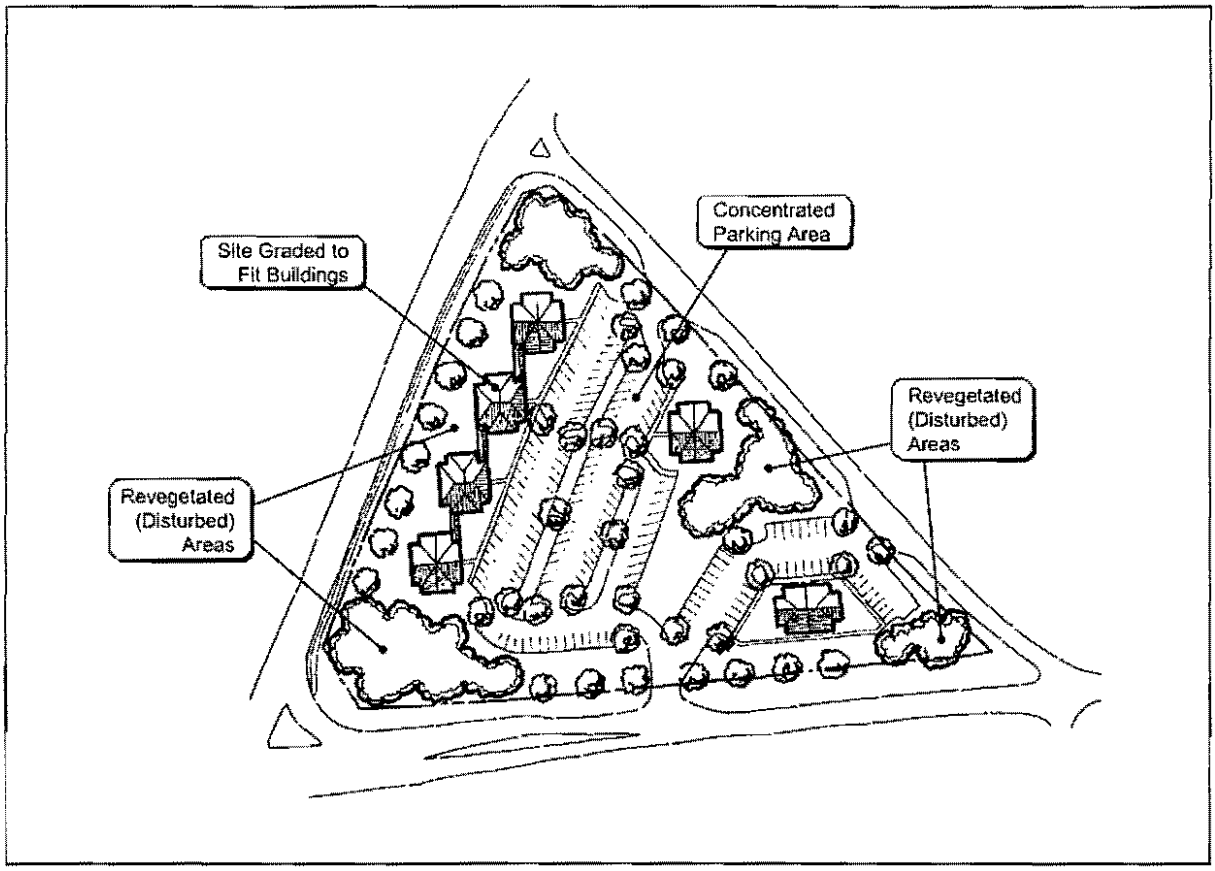
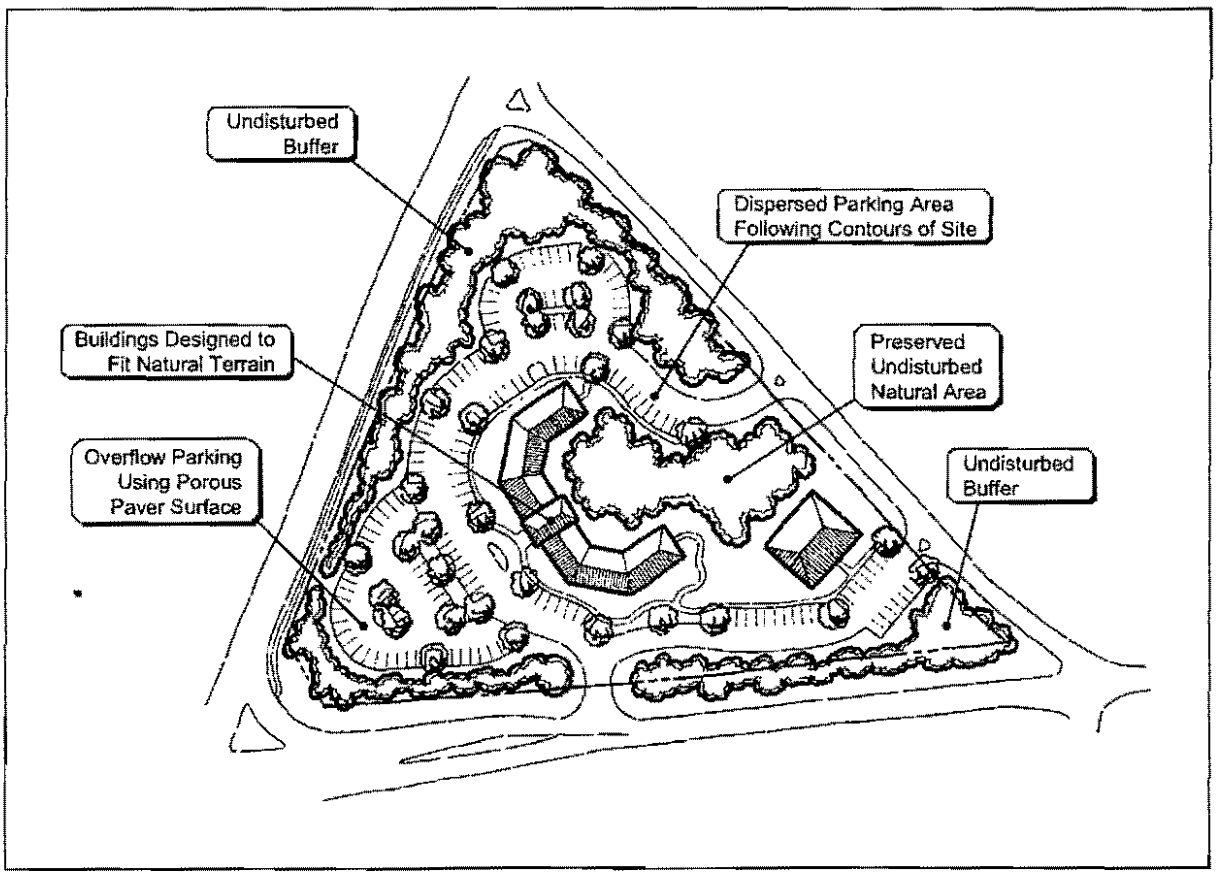


Figure 4.3-2 Comparison of a Traditional Office Park Design (above) and an Innovative Site Plan Developed Using Better Site Design Practices (below).



Utilization of Natural Features for Stormwater Management

Traditional stormwater drainage design tends to ignore and replace natural drainage patterns and often results in overly efficient hydraulic conveyance systems. Structural stormwater controls are costly and often can require high levels of maintenance for optimal operation. Through use of natural site features and drainage systems, careful site design can reduce the need and size of structural conveyance systems and controls. Some of the methods of incorporating natural features into an overall stormwater management site plan include the following:

- Using Buffers and Undisturbed Areas
- Using Natural Drainageways Instead of Storm Sewer Systems
- Use Vegetated Swales Instead of Curb and Gutter
- Draining Runoff to Pervious Areas

Sections 4.4 - 4.6 omitted. The complete document is available at www.georgiastormwater.com

4.7 Guidance on Structural Stormwater Controls

4.7.1 Introduction

The impacts of stormwater runoff from development cannot be completely mitigated by land use and nonstructural approaches. Therefore, a community must develop a program to require the use of structural stormwater control measures on new development and redevelopment sites. Structural stormwater controls (sometimes referred to as *structural best management practices* or *BMPs*) are constructed stormwater management facilities designed to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity due to urbanization.

Volume 2 recommends a number of structural stormwater controls for Georgia that can be used for meeting the minimum stormwater management standards for development and the unified stormwater sizing criteria. These recommended controls are divided into three categories: *general application*, *limited application*, and *detention* structural controls. The next several pages describe the structural controls recommended for use in Georgia communities.

4.7.2 Recommended Structural Stormwater Control Practices for Georgia Communities

General Application Controls

General application structural controls are recommended for use with a wide variety of land uses and development types. These structural controls have a demonstrated ability to effectively treat the Water Quality Volume (WQ_v) and are presumed to be able to remove 80% of the total annual average TSS load in typical post-development urban runoff when designed, constructed and maintained in accordance with recommended specifications. Several of the general application structural controls can also be designed to provide water quantity control; i.e., downstream channel protection (CP_v), overbank flood protection (Q_{p25}) and/or extreme flood protection (Q_f). General application controls are the recommended stormwater management facilities for a site wherever feasible and practical.

There are six types of general application controls, which are summarized below. Detailed descriptions of each structural control along with design criteria and procedures are provided in Volume 2, Section 3.2.

Stormwater Ponds

Stormwater ponds are constructed stormwater retention basins that have a permanent pool (or micropool) of water. Runoff from each rain event is detained and treated in the pool. Pond design variants include:

- Wet Pond
- Wet Extended Detention Pond
- Micropool Extended Detention Pond
- Multiple Pond Systems

Stormwater Wetlands

Stormwater wetlands are constructed wetland systems used for stormwater management. Stormwater wetlands consist of a combination of shallow marsh areas, open water and semi-wet areas above the permanent water surface. Wetland design variants include:

- Shallow Wetland
- Extended Detention Shallow Wetland
- Pond/Wetland Systems
- Pocket Wetland

Bioretention Areas

Bioretention areas are shallow stormwater basins or landscaped areas that utilize engineered soils and vegetation to capture and treat stormwater runoff. Runoff may be returned to the conveyance system, or allowed to fully or partially exfiltrate into the soil.

Sand Filters

Sand filters are multi-chamber structures designed to treat stormwater runoff through filtration, using a sand bed as the primary filter media. Filtered runoff may be returned to the conveyance system, or allowed to fully or partially exfiltrate into the soil. The two sand filter design variants are:

- Surface Sand Filter
- Perimeter Sand Filter

Infiltration Trenches

An infiltration trench is an excavated trench filled with stone aggregate used to capture and allow infiltration of stormwater runoff into the surrounding soils from the bottom and sides of the trench.

Enhanced Swales

Enhanced swales are vegetated open channels that are explicitly designed and constructed to capture and treat stormwater runoff within dry or wet cells formed by check dams or other means. The two types of enhanced swales are:

- Dry Swale
- Wet Swale/Wetland Channel

Limited Application Controls

Limited application structural controls are those that are recommended only for limited use or for special site or design conditions. Generally, these practices: (1) cannot alone achieve the 80% TSS removal target, (2) are intended to address hotspot or specific land use constraints or conditions, and/or (3) may have high or special maintenance requirements that may preclude their use. Limited application controls are typically used for *water quality treatment only.*

Some of these controls can be used as a pretreatment measure or in series with other structural controls to meet pollutant removal goals. Limited application structural controls should be considered primarily for commercial, industrial or institutional developments.

The following limited application controls are provided for consideration in this Manual. Each is discussed in detail with appropriate application guidance in Volume 2, Section 3.3.

Biofilters

- Filter Strip
- Grass Channel

Filtering Practices

- Organic Filter
- Underground Sand Filter

Wetland Systems

- Submerged Gravel Wetland

Hydrodynamic Devices

- Gravity (Oil-Grit) Separator

Porous Surfaces

- Modular Porous Paver Systems
- Porous Concrete

Chemical Treatment

- Alum Treatment System

Proprietary Systems

- Commercial Stormwater Controls

Detention Controls

Detention structural controls are used only for providing water quantity control (channel protection, overbank flood protection, or extreme channel protection), and are typically used downstream of a general application or limited application structural control. Types of detention controls include:

- Dry Detention and Dry Extended Detention Basins
- Multi-purpose Detention Areas
- Underground Detention

A detailed discussion of each of the detention controls, as well as design criteria and procedures can be found in Volume 2, Section 3.4.

4.7.3 Suitability of Structural Stormwater Controls to Meet Stormwater Management Requirements

Table 4.7-1 summarizes the stormwater management suitability of the various structural controls in addressing each of the unified stormwater sizing criteria. Given that many structural controls cannot meet all of the sizing criteria, typically two or more controls are used in series to form what is known as a stormwater "treatment train." Volume 2, Section 3.1 provides guidance on the use of a treatment train as well as how to calculate the pollutant removal efficiency for structural controls in series. Volume 2 also provides guidance for choosing the appropriate structural stormwater control(s) for a site as well as the basic considerations and limitations on the use of a particular structural control.

Table 4.7-1 Suitability of Structural Stormwater Controls to Meet Unified Stormwater Sizing Criteria

Structural Stormwater Control	Water Quality Volume (WQ_v)	Channel Protection (CP_v)	Overbank Flood Protection (Q_{p25})	Extreme Flood Protection (Q_f)
General Application				
Stormwater Ponds	✓	✓	✓	✓
Stormwater Wetlands	✓	✓	✓	✓
Bioretention Areas	✓	✪	●	●
Sand Filters	✓	✪	●	●
Infiltration Trenches	✓	✪	●	●
Enhanced Swales	✓	✪	✪	●
Limited Application				
Biofilters	O	●	●	●
Filtering Practices	✓	●	●	●
Wetland Systems	✓	●	●	●
Hydrodynamic Devices	O	●	●	●
Porous Surfaces	✓	✪	●	●
Chemical Treatment	✓	●	●	●
Proprietary Systems	*	*	*	*
Detention Controls	●	✓	✓	✓

✓ = Able to meet stormwater sizing criterion (for water quality, this control is presumed to meet the 80% TSS reduction goal when sized to treat the WQ_v and designed, constructed and maintained properly)

O = Typically provides partial treatment of WQ_v. May be used in pretreatment and as part of a "treatment train"

✪ = Can be incorporated into the structural control in certain situations

● = Not typically able or used to meet stormwater sizing criterion

* = The application and performance of specific commercial devices and systems must be provided by the manufacturer and should be verified by independent third-party sources and data

4.7.4 Implementing Application and Design Criteria for Structural Stormwater Controls

In order to implement a structural stormwater control program and requirements, a local government must first determine the suite of structural controls that will be allowed by the community. The recommended structural controls for Georgia communities provided in this Manual is a good starting point, as these controls were selected by a task force of local government staff and stormwater experts. Communities can allow controls not included in this Manual (including various commercial systems) at their discretion, but should not do so without independently derived information concerning performance, maintenance, and application requirements and limitations.

Once the list of allowable stormwater controls has been determined, specific application and design guidance should be developed and provided for each structural control practice, including:

- General Description of the Structural Stormwater Control
- Stormwater Management Suitability
- Pollutant Removal Capabilities and Design Removal Efficiencies
- Application and Site Feasibility Criteria
- Planning and Design Criteria
- Design Procedures
- Inspection and Maintenance Requirements
- Construction and Materials Specifications
- Example Schematics
- Design Forms

This guidance should be provided in a design manual or handbook along with specific design examples. Volume 2 contains this information for many of the recommended structural controls listed above. Additional guidance in the form of training seminars and workshops is invaluable to educating the development community on the design, construction and ongoing maintenance issues involved with using structural stormwater controls.

4.8 Stormwater Management Site Plans

4.8.1 Introduction

To encourage and ensure that local stormwater guidelines and requirements are implemented, communities should implement a formal site plan preparation, submittal, and review procedure that facilitates open communication and understanding between the involved parties.

A stormwater management site plan is a comprehensive report that contains the technical information and analysis to allow a community to determine whether a proposed new development or redevelopment project meets the local stormwater regulatory requirements. This section discusses the typical contents of a stormwater management site plan and the recommended review and consultation checkpoints between the local government staff and the site developer.

The procedures and guidelines for the preparation of a site stormwater plan should be explicitly stated in a local ordinance. The ordinance, in turn, may refer to a design guidance document for additional detail. Ideally, site stormwater plans are developed with open lines of communication between the developer (and developer's engineer) and the plan reviewer. Stormwater plans are more than just the preparation of a document and maps. Instead, stormwater plans should be thought of as a process that occurs over the planning and development cycle and then continues after buildout via regular inspection and maintenance of the stormwater management system.

4.8.2 Contents of a Stormwater Management Site Plan

The following elements are recommended components for local stormwater management site plan requirements. Based on a community's prerogative, small-scale projects could be allowed to prepare a site plan that includes a defined subset of the elements outlined below.

1) Existing Conditions Hydrologic Analysis

- A topographic map of existing site conditions (minimum 2-foot contour interval recommended) with the basin boundaries indicated
- Acreage, soil types and land cover of areas for each subbasin affected by the project
- All perennial and intermittent streams and other surface water features
- All existing stormwater conveyances and structural control facilities
- Direction of flow and exits from the site
- Analysis of runoff provided by off-site areas upstream of the project site
- Methodologies, assumptions, site parameters and supporting design calculations used in analyzing the existing conditions site hydrology

2) **Post-Development Hydrologic Analysis**

- A topographic map of developed site conditions (minimum 2-foot contour interval recommended) with the post-development basin boundaries indicated
- Total area of post-development impervious surfaces and other land cover areas for each subbasin affected by the project
- Unified stormwater sizing criteria runoff calculations for water quality, channel protection, overbank flooding protection and extreme flood protection for each subbasin
- Location and boundaries of proposed natural feature protection areas
- Documentation and calculations for any applicable site design credits that are being utilized
- Methodologies, assumptions, site parameters and supporting design calculations used in analyzing the existing conditions site hydrology

3) **Stormwater Management System**

- Drawing or sketch of the stormwater management system including the location of non-structural site design features and the placement of existing and proposed structural stormwater controls. This drawing should show design water surface elevations, storage volumes available from zero to maximum head, location of inlet and outlets, location of bypass and discharge systems, and all orifice/restrictor sizes.
- Narrative describing that appropriate and effective structural stormwater controls have been selected
- Cross-section and profile drawings and design details for each of the structural stormwater controls in the system. This should include supporting calculations to show that the facility is designed according to the applicable design criteria.
- Hydrologic and hydraulic analysis of the stormwater management system for all applicable design storms (should include stage-storage or outlet rating curves, and inflow and outflow hydrographs)
- Documentation and supporting calculations to show that the stormwater management system adequately meets the unified stormwater sizing criteria
- Drawings, design calculations and elevations for all existing and proposed stormwater conveyance elements including stormwater drains, pipes, culverts, catch basins, channels, swales and areas of overland flow

4) **Downstream Analysis**

- Supporting calculations for a downstream peak flow analysis using the ten-percent rule necessary to show safe passage of post-development design flows downstream

5) **Erosion and Sedimentation Control Plan**

- Must contain all the elements specified in the Georgia Erosion and Sediment Control Act and local ordinances and regulations
- Sequence/phasing of construction and temporary stabilization measures
- Temporary structures that will be converted into permanent stormwater controls

6) **Landscaping Plan**

- Arrangement of planted areas, natural areas and other landscaped features on the site plan
- Information necessary to construct the landscaping elements shown on the plan drawings
- Descriptions and standards for the methods, materials and vegetation that are to be used in the construction

7) **Operations and Maintenance Plan**

- Description of maintenance tasks, responsible parties for maintenance, funding, access and safety issues

8) **Evidence of Acquisition of Applicable Local and Non-local Permits**

9) **Waiver Requests**

4.8.3 Procedure for Reviewing Stormwater Site Plans

Section 1.3 of Volume 2 describes the general procedure in the preparation of a stormwater site plan. The following steps are intended to provide a community with a review process and checkpoints that complements the procedure from the site developer's perspective:

(1) Pre-consultation Meeting and Joint Site Visit

(2) Review Stormwater Concept Plan

(3) Review Preliminary Stormwater Site Plan

(4) Review Final Stormwater Site Plan

Additional steps to ensure compliance with the stormwater management site plan include:

(5) Pre-construction Meeting

(6) Construction Inspections

(7) Ongoing Maintenance Inspections

Step 1. Pre-consultation Meeting and Joint Site Visit

The most important action that can take place at the beginning of the development project is a pre-consultation meeting between the local review authority and the developer and his team to outline the stormwater management requirements and other regulations, and to assist developers in assessing constraints, opportunities, and potential for stormwater design concepts.

This recommended step helps to establish a constructive partnership through the development process. A joint site visit, if possible, can yield a conceptual outline of the stormwater management plan and strategies. By walking the site, the two parties can identify and anticipate problems, define general expectations and establish general boundaries of natural feature protection and conservation areas. A major incentive for pre-consultation is that permitting and plan approval requirements will become clear at an early stage, increasing the likelihood that the approval process will proceed faster and more smoothly.

The site developer should be made familiar with the local stormwater management and development requirements and design criteria that apply to the site. These may include:

- Minimum design and performance standards for stormwater management
- Design storm frequencies
- Conveyance design criteria
- Floodplain criteria
- Buffer/setback criteria
- Wetland provisions
- Watershed-based criteria
- Erosion and sedimentation control requirements
- Maintenance requirements
- Need for physical site evaluations (infiltration tests, geotechnical evaluations, etc.)

This guidance could be provided at the pre-consultation meeting and should be detailed in various local ordinances (e.g., subdivision codes, stormwater and drainage codes, etc). This information could be contained in a set of checklists which would be provided to the developer. Appendix B contains example checklists outlining the necessary steps to prepare preliminary and final stormwater management site plans.

Current land use plans, comprehensive plans, zoning ordinances, road and utility plans, watershed or overlay districts, and public facility plans should all be consulted to determine the need for compliance with other local and state regulatory requirements. Opportunities for special types of development (e.g., clustering) or special land use opportunities (e.g., conservation easements or tax incentives) should be investigated. There may also be an ability to partner with the site developer in the development of greenways or open space parks.

Step 2. Review Stormwater Concept Plan

During the concept plan stage the site designer will perform most of the layout of the site including the preliminary stormwater management system design and layout. The stormwater concept plan allows the design engineer to propose a potential site layout and gives the developer and local review authority a "first look" at the stormwater management system for the proposed development. The stormwater concept plan should be submitted to and approved by the local plan reviewer before detailed preliminary site plans are developed.

It is extremely important at this stage that stormwater design is integrated into the overall site design concept in order to best reduce the impacts of the development as well as provide for the most cost-effective and environmentally sensitive approach.

Step 3. Review Preliminary Stormwater Site Plan

The preliminary plan ensures that local requirements and criteria are being complied with and that opportunities are being taken to minimize adverse impacts from the development.

The preliminary stormwater management site plan should consist of maps, narrative, and supporting design calculations (hydrologic and hydraulic) for the proposed stormwater management system, and should include the following elements from section 4.8.2:

- **Existing Conditions Hydrologic Analysis**
- **Post-Development Hydrologic Analysis**
- **Stormwater Management System**
- **Downstream Analysis**

It should be demonstrated that appropriate and effective stormwater controls have been selected and adequately designed. The preliminary plan should also include, among other things, street and site layout, delineation of natural feature protection and conservation areas, soils data, existing and proposed topography, relation of site to upstream drainage, limits of clearing and grading, and proposed methods to manage and maintain conservation areas (e.g., easements, maintenance agreements/responsibilities, etc.)

Step 4. Review Final Stormwater Site Plan

The final stormwater management site plan adds further detail to the preliminary plan and reflects changes that are requested or required by the local review authority. The final stormwater site plan should include all of the revised elements from the preliminary plan as well as the following items:

- **Erosion and Sedimentation Control Plan**
- **Landscaping Plan**
- **Operations and Maintenance Plan**
- **Evidence of Acquisition of Applicable Local and Non-local Permits**
- **Waiver Requests**

- This process may be iterative. The reviewer should ensure that all submittal requirements have been satisfactorily addressed and permits, easements, and pertinent legal agreements (e.g., maintenance agreements, performance bond, etc.) have been obtained and/or executed.

The completed final stormwater site plan should be submitted to the local review authority for final approval prior to any construction activities on the development site. Approval of the final plan is the last major milestone in the stormwater planning process. The remaining steps are to ensure that the plan is installed, implemented, and maintained properly.

Step 5. Pre-construction Meeting

This step ensures that the contractor, engineer, inspector, and plan reviewer can be sure that each party understands how the plan will be implemented on the site. A pre-construction meeting should occur before any clearing or grading is initiated on the site. This is the appropriate time to ensure that natural feature protection areas and limits of disturbance have been adequately staked and adequate erosion and sediment control measures are in place.

Step 6. Construction Inspections

Project sites should periodically be inspected during construction by local agencies to ensure that conservation areas have been adequately protected and that stormwater control and conveyance facilities are being constructed as designed. Inspection frequency may vary with regard to site size and location; however, monthly inspections are a good target. In addition it is recommended that some inspections occur after larger storm events (e.g., 0.5 inches and greater). The inspection process can prevent later problems that result in penalties and added cost to developers.

An added benefit of a formalized and regular inspection process is that it should help to motivate contractors to internalize regular maintenance of sediment controls as part of the daily construction operations. If necessary, a community can consider implementing a penalty system, whereby fines can be assessed or even stop work orders issued.

A final inspection is needed to ensure that the construction conforms to the intent of the approved design. Prior to issuing an occupancy permit and releasing any applicable bonds, the review authority should ensure that: (1) temporary erosion control measures have been removed; (2) stormwater controls are unobstructed and in good working order; (3) permanent vegetation cover has been established in exposed areas; (4) any damage to natural feature protection and conservation areas has been restored; (5) conservation areas and buffers have been adequately marked or signed; and (6) any other applicable conditions.

Record drawings of the structural stormwater controls and drainage facilities should also be acquired by the community, as they are important in the long-term maintenance of the facilities. The review authority should keep copies of the drawings and associated documents and develop a local stormwater control inventory and data storage system. With geographic information systems (GIS) becoming more widely used, much of these data can be stored electronically.

Step 7. Ongoing Maintenance Inspections

Ongoing inspection and maintenance of a project site's stormwater management system is often the weakest component of stormwater plans. It needs to be clearly detailed in the stormwater site plan which entity has responsibility for operation and maintenance of all structural stormwater controls and drainage facilities. Often, the responsibility for maintenance is transferred from the developer and contractor to the owner. Communication about this important responsibility is usually inadequate; therefore communities may need to consider ways to notify property owners of their responsibilities. For example, notification can be made through a legal disclosure upon sale or transfer of property or public outreach programs may be instituted to describe the purpose and value of maintenance.

Ideally, preparation of maintenance plans should be a requirement of the stormwater site plan preparation and review process. A maintenance plan should outline the scope of activities, schedule, and responsible parties. Vegetation, sediment management, access, and safety issues should also be addressed. It is important that the maintenance plan contains the necessary provisions to ensure that vegetation establishment occurs in the first few years after construction. In addition, the plan should address testing and disposal of sediments that will likely be necessary.

Annual inspections of stormwater management facilities should be conducted by an appropriate local agency. Where chronic or severe problems exist, the local government should have the authority to remedy the situation and charge the responsible party for the cost of the work. This authority should be well established in an ordinance.

Final 4
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MENU OF MANAGEMENT PROGRAM OPTIONS

Construction Site Storm Water Runoff Control

The following "Menu of Management Program Options" has been developed from a number of sources, including suggestions by Regional Program participants at the Construction Site Runoff Control Workshops, local erosion and sediment control ordinances, EPA documents, and others. Participants may consider these options in the process of developing the construction component of their municipal storm water management plan.

These suggestions do not represent the complete universe of alternatives available, nor do they represent an attempt to present a packaged storm water management plan. It is the responsibility of each city or county to develop a complete storm water management plan that meets the regulatory requirements. Consider the regulatory goal of "maximum extent practicable" (MEP) when developing your storm water management plan and realize that implementation of the plan and related ordinances becomes a condition of your storm water permit. Prepare a plan that is functional and can be implemented effectively in your jurisdiction.

The italicized text included below is the language for the "Construction Site Storm Water Runoff Control" Minimum Measure taken from EPA's Final Phase II Rule. The Final Phase II Rule establishes the minimum requirements that TNRCC will use in drafting the corresponding storm water permit for small municipalities in Texas. Cities and counties should use these requirements in planning their storm water management programs until TNRCC issues the Texas permit (TNRCC must issue the Phase II municipal storm water permit by December 9, 2002).

"Your NPDES MS4 permit will require at a minimum that you develop, implement and enforce a storm water management program designed to reduce the discharge of pollutants from your MS4 to the maximum extent practicable (MEP) [and] to protect water quality...Your storm water management program must include the [following] minimum control measures..."

"Construction site storm water runoff control. (i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more."

"(ii) Your program must include the development and implementation of, at a minimum:"

"(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;"

Note: For organizational purposes, this section will primarily cover policy and procedural elements of the ordinance. Technical requirements imposed by the ordinance are covered under other sections.

Coordination with Federal/State Construction Permits and NCTCOG Regional Program

- Require NPDES or TPDES construction permit coverage as part of ordinance and require copy of Notice of Intent to be filed with MS4 operator
- Establish that a violation of an NPDES or TPDES construction permit is a violation of the local ordinance
- Establish local minimum training requirements and require contractors to submit qualifications of individuals with responsibility for inspection and maintenance of storm water pollution prevention best management practices
- Require usage of best management practices (BMPs) detailed in the NCTCOG Construction BMP Manual
- Require NCTCOG Construction BMP Manual recommended 70% site rating (E&S plan designed to retain a minimum of 70% of potential sediment loss)

Local Permit Options

Note: The Phase II MS4 storm water regulations do not specifically require cities/counties to have a local permit for earth disturbing activities; however a permit system may help in tracking clearing and grading activities.

- Require a grading permit for any earth disturbing or filling activities; and/or
- Require a building permit for any construction (including grading) or demolition activities

Discharge Prohibition

- Prohibit all non-storm water discharges (except those allowed by EPA/TNRCC) from the site under development; and/or
- Prohibit sediment, trash, or debris from leaving the site under development; and/or
- Prohibit sediment, trash, or debris from entering the MS4 (including streets) and receiving waters as a result of construction activities on a property

Sanctions for Noncompliance

Note: Provide for escalating levels of sanctions depending on severity of violation and repeated failure of operator to correct identified deficiencies (warnings, fines, stop work orders, etc.)

- Require posting of bond (or deposit) to cover cost of restoration/final stabilization if operator defaults; and/or
- Establish procedures for issuance of warning notice of violation (with no fine associated) for first time offense; and/or
- Establish provisions for fines for violations, with each day of noncompliance constituting a separate offense; and/or
- Establish provisions to issue stop-work orders; and/or
- Establish provisions for the local government to correct violations and charge the offender for reimbursement of costs incurred; and/or
- Establish provisions for the local government to take out a lien against the property to recover expenses to correct violations; and/or
- Establish provisions to deny further permit approvals or project authorizations to non-complying developers or contractors

Residential Subdivision Issues

- Incorporate requirement in subdivision regulations for developers and contractors to comply with state and federal construction storm water permit rules (particularly useful for counties with limited enforcement authority)

- Require the developer to post an erosion control deposit for each lot in a residential development (Plano)
- Require final stabilization of all disturbed ground prior to acceptance of infrastructure
- Require the land developer to maintain temporary and permanent erosion and sediment controls on all lots for which a building permit has not been issued (unless entire project transferred to one builder who would then assume the responsibility)
- Require the land developer to maintain all temporary and permanent erosion and sediment controls not associated with individual lots (inlet protection, sediment basins, common areas, etc.) until the subdivision is built-out or the project is transferred to one builder who would then assume the responsibility for BMP maintenance
- Require that all utilities be in place prior to acceptance of infrastructure
- Require individual purchasers of new homes to establish final stabilization if not conducted by homebuilder

"(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices"

Note: These requirements can be included in the erosion and sediment control ordinance, or may be implemented by other procedural means such as engineering or drainage standards.

Erosion and Sediment Control Plan

- Require submission and approval of an erosion and sediment control (E&S) plan prior to earth disturbing activities; and/or
- Require submission of the Storm Water Pollution Prevention Plan (SWPPP) specified by the NPDES or TPDES construction permit
- Require E&S plan (or SWPPP) to be prepared by an individual with appropriate credentials (erosion control certification, licensed engineer or landscape architect, etc.)
- Require E&S plan (or SWPPP) to reflect different phases of construction (clearing, grading, infrastructure, building, completion/landscaping)
- Require E&S plan (or SWPPP) to note sequence of construction/installation of BMPs
- Provide a checklist to developers, engineers, and contractors with specific erosion and sediment control plan requirements

Best Management Practices

- Require BMPs to be installed and maintained as specified in the NCTCOG Construction BMP Manual (or TPWA, ASCE, etc.)
- Require disturbed area to be limited to the greatest extent possible
- Require specific approval and permanent stabilization measures for cut/fill slopes over 3:1
- Require local approval for temporary stream crossings and construction activities in waterways (in addition to any required Army Corps of Engineers approval)
- Require velocity dissipation for water or fire line flushing operations

Practices for Individual Residential Lots

- Require a "limited" or "generic" erosion and sediment control plan as a condition of issuing a building permit
- Require a minimum of 8' (or other appropriate width) of erosion control matting around downslope perimeter of lot or adjacent to curb face and drainage swales

"(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality"

Waste Management Plans/Procedures

- Require usage of best management practices (BMPs) detailed in the NCTCOG Construction BMP Manual (or TPWA, ASCE, etc.)
- Require locations of waste containers, concrete washout facilities, chemical storage areas, refueling areas, sanitary facilities, and chlorinated water treatment facilities to be shown on appropriate plans (construction, E&S, SWPPP, etc.)
- Require waste collection areas to be located such that they do not receive substantial runoff from upland areas and do not drain directly to the MS4 (including streets) or receiving waters
- Require sanitary waste facilities (portable toilets) to be located a specified minimum distance (~10 to 20 feet) away from storm drain inlets and receiving waters; and/or
- Require containment for sanitary waste facilities (portable toilets)
- Require management of chlorinated water discharge from water line sanitation operations to provide for dissipation of chlorine (and velocity) prior to discharge to MS4 or receiving waters (sheet flow over vegetation, spray irrigation over vegetation, temporary impoundment, etc.)
- Provide a checklist to developers, engineers, and contractors with waste management plan requirements
- Audit facilities that collect waste materials from construction sites to ensure they are not dumping illegally

Hazardous Waste Management

- Require chemicals, paint, petroleum, fertilizer, and pesticide to be stored in a covered enclosure
- Require above ground petroleum storage tanks to be placed in a bermed enclosure
- Require disposal of empty/unused chemical containers in accordance with label instructions (or provide more detailed local instructions)
- Require segregation of potentially hazardous and non-hazardous wastes
- Require spill control procedures and notification of spills to the MS4

Construction Waste and Trash Management

- Require appropriate waste containers that prohibit pollutant runoff
- Require daily cleanup of construction site and placement of all waste and trash in approved containers
- Require disposal of all construction site wastes at authorized disposal facilities
- Require (or encourage) recycling of appropriate waste construction materials (Frisco)

"(D) Procedures for site plan review which incorporate consideration of potential water quality impacts"

Development Review Committee

- Implement a Development Review Committee to review applicable plans to ensure compliance with erosion and sediment/waste control requirements for all public and private construction projects

- Development Review Committee composition could include staff from engineering, public works, and environmental management as appropriate
- Require a tree survey (if a tree ordinance is in place) to be included in the development plans

Pre-construction Meeting

- Require a pre-construction meeting for all public and private projects to outline sediment and erosion/waste control requirements to the developer and contractors
- Include inspector with responsibility for storm water inspection for the project in the pre-construction meeting
- Provide an information packet outlining storm water program requirements to developers and contractors

Education/Training for Developers, Builders, and Contractors

- Conduct periodic meetings to educate companies involved in public and private construction in the jurisdiction on local pollution prevention requirements and procedures

"(E) Procedures for receipt and consideration of information submitted by the public"

Complaint Response

- Establish a "hotline" phone number for citizen complaints (NCTCOG could establish regional hotline)
- Establish a maximum time to investigate and report back to person making complaint
- Establish procedures for recordkeeping of complaints and corrective actions taken
- Incorporate response to citizen complaints into the construction inspection process

"(F) Procedures for site inspection and enforcement of control measures"

Organization

- Use existing inspection organizations (engineering, public works, building) and incorporate inspection of erosion and sediment/waste controls into their normal functions; or
- Create a storm water or environmental management department with sole or primary responsibility for erosion and sediment/waste control inspections

Training and Materials

- Provide training to all personnel involved in construction inspection and enforcement on inspection of storm water pollution prevention practices for construction
- Provide training to other personnel to recognize erosion and sediment control problems and report to appropriate department
- Provide a standard form with all inspection requirements for use on inspections

Inspection Frequency/Notification Requirements

- Establish appropriate frequencies for inspection of construction storm water BMPs for different types of development: residential subdivision infrastructure construction (once per week or two weeks, and/or at other required inspections); single family residence (at each code inspection); commercial construction (clearing, grading, code inspections); and/or
- Establish a general frequency of inspection of all active construction sites (i.e. all sites inspected at least once per month); and/or

- Establish priorities for inspections of construction sites depending on probable impact (size or type of development, proximity to sensitive receiving waters, etc.)
- Conduct inspections in response to observations by local government personnel or citizen complaints
- Require notification from contractor prior to start or on completion of various stages of construction (filing of NOI, start of clearing, completion of installation of BMPs, completion of clearing, completion of grading, completion of final landscaping, filing of NOT, etc)

Procedures

- Establish procedures for notifying operators of violations and required corrective actions depending on the type of violation
- Establish allowable time for corrective action depending on severity of actual or likely impact on receiving waters as a result of violation
- Establish procedures for recordkeeping of inspections and compliance actions

Enforcement

Note: These measures can be used in addition to the sanctions included in the ordinance section above.

- Withhold payment on public projects (authority may need to be provided for in contract documents)
- Withhold building, plumbing, electrical, etc. inspection approvals (authority may need to be provided for in building ordinance) until corrective measures are completed
- Utilize litter, health, nuisance or other related ordinance authority to require cleanup of construction sites

United States Environmental Protection Agency | Office of Water (4203) | EPA 833-F-00-008 January 2000 Fact Sheet 2.6

Storm Water Phase II Final Rule

Construction Site Runoff Control Minimum Control Measure

This fact sheet profiles the Construction Site Runoff Control minimum control measure, one of six measures that the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its storm water management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This fact sheet outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them. It is important to keep in mind that the small MS4 operator has a great deal of flexibility in choosing exactly how to satisfy the minimum control measure requirements.

Why Is The Control of Construction Site Runoff Necessary?

Polluted storm water runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the pollutants listed in Table 1, sediment is usually the main pollutant of concern. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. For example, excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

Table 1

Pollutants Commonly Discharged From Construction Sites
Sediment
Solid and sanitary wastes
Phosphorous (fertilizer)
Nitrogen (fertilizer)
Pesticides
Oil and grease
Concrete truck washout
Construction chemicals
Construction debris

What Is Required?

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The small MS4 operator is required to:

- ❑ Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;
- ❑ Have procedures for site plan review of construction plans that consider potential water quality impacts;
- ❑ Have procedures for site inspection and enforcement of control measures;
- ❑ Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);

- ❑ Establish procedures for the receipt and consideration of information submitted by the public; and
- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Suggested BMPs (i.e., the program actions/activities) and measurable goals are presented below.

What Are Some Guidelines for Developing and Implementing This Measure?

Further explanation and guidance for each component of a regulated small MS4's construction program is provided below.

Regulatory Mechanism

Through the development of an ordinance or other regulatory mechanism, the small MS4 operator must establish a construction program that controls polluted runoff from construction sites with a land disturbance of greater than or equal to one acre. Because there may be limitations on regulatory legal authority, the small MS4 operator is required to satisfy this minimum control measure only to the maximum extent practicable and allowable under State, Tribal, or local law.

Site Plan Review

The small MS4 operator must include in its construction program requirements for the implementation of appropriate BMPs on construction sites to control erosion and sediment and other waste at the site. To determine if a construction site is in compliance with such provisions, the small MS4 operator should review the site plans submitted by the construction site operator before ground is broken.

Site plan review aids in compliance and enforcement efforts since it alerts the small MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities. The tracking of sites is useful not only for the small MS4 operator's recordkeeping and reporting purposes, which are required under their NPDES storm water permit (see Fact Sheet 2.9), but also for members of the public interested in ensuring that the sites are in compliance.

Inspections and Penalties

Once construction commences, BMPs should be in place and the small MS4 operator's enforcement activities should begin. To ensure that the BMPs are properly installed, the small MS4 operator is required to develop procedures for site inspection and enforcement of control measures to deter infractions. Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality. Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties. To conserve staff resources, one possible option for small MS4 operators is to have these inspections performed by the same inspector that visits the sites to check compliance with health and safety building codes.

Information Submitted by the Public

A final requirement of the small MS4 program for construction activity is the development of procedures for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities. This provision is intended to further reinforce the public participation component of the regulated small MS4 storm water program (see Fact Sheet 2.4) and to recognize the crucial role that the public can play in identifying instances of noncompliance.

The small MS4 operator is required only to *consider* the information submitted, and may not need to follow-up and respond to every complaint or concern. Although some form of enforcement action or reply is not required, the small MS4 operator is required to demonstrate acknowledgment and consideration of the information submitted. A simple tracking process in which submitted public information, both written and verbal, is recorded and then given to the construction site inspector for possible follow-up will suffice.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Ordinance or other regulatory mechanism in place; procedures for information submitted by the public in place.
2 years.....	Procedures for site inspections implemented; a certain percentage rate of compliance achieved by construction operators.
3 years.....	Maximum compliance with ordinance; improved clarity and reduced sedimentation of local waterbodies.
4 years.....	Increased numbers of sensitive aquatic organisms in local waterbodies.

Are Construction Sites Already Covered Under the NPDES Storm Water Program?

Yes. EPA's Phase I NPDES storm water program requires operators of construction activities that disturb five or more acres to obtain a NPDES construction storm water permit. General permit requirements include the submission of a Notice of Intent and the development of a storm water pollution prevention plan (SWPPP). The SWPPP must include a site description and measures and controls to prevent or minimize pollutants in storm water discharges. The Phase II Final Rule similarly regulates discharges from smaller construction sites disturbing equal to or greater than one acre and less than five acres (see Fact Sheet 3.0 for information on the Phase II construction program).

Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure for the small MS4 program is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s.

To aid operators of regulated construction sites in their efforts to comply with both local requirements and their NPDES permit, the Phase II Final Rule includes a provision that allows the NPDES permitting authority to reference a "qualifying State, Tribal or local program" in the NPDES general permit for construction. This means that if a construction site is located in an area covered by a qualifying local program, then the construction site operator's compliance with the local program constitutes compliance with their NPDES permit. A regulated small MS4's storm water program for construction could be a "qualifying program" if the MS4 operator requires a SWPPP, in addition to the requirements summarized in this fact sheet.

The ability to reference other programs in the NPDES permit is intended to reduce confusion between overlapping and similar requirements, while still providing for both local and national regulatory coverage of the construction site. The provision allowing NPDES permitting authorities to reference other programs has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site runoff control minimum measure profiled here.

Is a Small MS4 Required to Regulate Construction Sites that the Permitting Authority has Waived from the NPDES Construction Program?

No. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity (see 122.26(b)(15)(i)), the small MS4 operator is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such construction sites.

For Additional Information

Contact

☞ U.S. EPA Office of Wastewater Management
- Phone: 202 260-5816
- E-mail: SW2@epa.gov
- Internet: www.epa.gov/owm/sw/phase2

Reference Documents

☞ Storm Water Phase II Final Rule Fact Sheet Series
- Internet: www.epa.gov/owm/sw/phase2

☞ Storm Water Phase II Final Rule (64 *FR* 68722)
- Internet: www.epa.gov/owm/sw/phase2
- Contact the U.S. EPA Water Resource Center
  - Phone: 202 260-7786
  - E-mail: center.water-resource@epa.gov

Building a Storm Water Management Plan, Part 1:
Construction Site Runoff Control Workshop Wrap-up

An important component of the effort to assist local governments in meeting Phase II storm water regulations is underway. A series of workshops was recently held in each of the four main watershed areas to gather implementation options related to the Construction Site Runoff Control Minimum Measure of the regulations.

Representatives of approximately 35 Phase II cities and counties attended the meetings and shared information on activities currently underway in their cities, along with ideas for expanding their programs to meet the regulations where necessary. Storm water management professionals from each of the seven Phase I cities in the Metroplex were also on-hand at the workshops to provide suggestions and insight gained from years of experience with implementing construction management programs in their cities.

The ideas presented at these workshops will form the core of a "Menu of Management Program Options" to be prepared by North Central Texas Council of Governments (NCTCOG) staff. Regional Storm Water Program participants will be able to select from the menu when developing their storm water management plans. As an example, one of the Construction Site Runoff Control Minimum Measures is that Phase II cities and counties must have sanctions to ensure that construction site operators are implementing erosion and sediment control practices. Some of the enforcement techniques suggested at the meetings included denying building permits, withholding building inspection approvals, fines, withholding payment to contractors on public projects, and others.

NCTCOG staff is preparing a draft of the Construction Site Runoff Control section of the menu, which will be distributed to participants and made available on the dfwstormwater.com Web site in early December.

Future workshops will address each of the remaining Phase II Minimum Measures. The next series, targeted for mid-January, will cover the Illicit Discharge Detection and Elimination Minimum Measure. Storm water program contacts will be notified of meeting locations and dates once established. For more information, contact **Jeff Rice**, NCTCOG, at **(817) 695-9212** or **jrice@dfwinfo.com**.

December '01

MENU OF MANAGEMENT PROGRAM OPTIONS

Construction Site Storm Water Runoff Control

The following "Menu of Management Program Options" has been developed from a number of sources, including suggestions by Regional Program participants at the Construction Site Runoff Control Workshops, local erosion and sediment control ordinances, EPA documents, and others. Participants may consider these options in the process of developing the construction component of their municipal storm water management plan.

These suggestions do not represent the complete universe of alternatives available, nor do they represent an attempt to present a packaged storm water management plan. It is the responsibility of each city or county to develop a complete storm water management plan that meets the regulatory requirements. Consider the regulatory goal of "maximum extent practicable" (MEP) when developing your storm water management plan and realize that implementation of the plan and related ordinances becomes a condition of your storm water permit. Prepare a plan that is functional and can be implemented effectively in your jurisdiction.

The italicized text included below is the language for the "Construction Site Storm Water Runoff Control" Minimum Measure taken from EPA's Final Phase II Rule. The Final Phase II Rule establishes the minimum requirements that TNRCC will use in drafting the corresponding storm water permit for small municipalities in Texas. Cities and counties should use these requirements in planning their storm water management programs until TNRCC issues the Texas permit (TNRCC must issue the Phase II municipal storm water permit by December 9, 2002).

"Your NPDES MS4 permit will require at a minimum that you develop, implement and enforce a storm water management program designed to reduce the discharge of pollutants from your MS4 to the maximum extent practicable (MEP) [and] to protect water quality...Your storm water management program must include the [following] minimum control measures..."

"Construction site storm water runoff control. (i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more."

"(ii) Your program must include the development and implementation of, at a minimum:"

"(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;"

Note: For organizational purposes, this section will primarily cover policy and procedural elements of the ordinance. Technical requirements imposed by the ordinance are covered under other sections.

Coordination with Federal/State Construction Permits

- Require NPDES or TPDES construction permit coverage as part of ordinance and require submission of Notice of Intent
- Establish that a violation of an NPDES or TPDES construction permit is a violation of the local ordinance
- Establish minimum training requirements and require contractors to submit qualifications of individuals with responsibility for inspection and maintenance of storm water pollution prevention best management practices

Discharge Prohibition

- Prohibit all non-storm water discharges (except those allowed by EPA/TNRCC) from the site under development; and/or
- Prohibit sediment, trash, or debris from leaving the site under development; and/or
- Prohibit sediment, trash, or debris from entering the MS4 (including streets) and receiving waters as a result of construction activities on a property

Permits

Note: The Phase II MS4 storm water regulations do not specifically require cities/counties to have a local permit for earth disturbing activities; however a permit system may help in tracking clearing and grading activities.

- Require a grading permit for any earth disturbing activities; and/or
- Require a building permit for any construction (including grading) or demolition activities

Sanctions for Noncompliance

Note: Provide for escalating levels of sanctions depending on severity of violation and repeated failure of operator to correct identified deficiencies (warnings, fines, stop work orders, etc.)

- Require posting of bond (or deposit) to cover cost of restoration/final stabilization if operator defaults; and/or
- Establish provisions for fines for violations, with each day of noncompliance constituting a separate offense; and/or
- Establish provisions to issue stop-work orders; and/or
- Establish provisions for the local government to correct violations and charge the offender for reimbursement of costs incurred; and/or
- Establish provisions for the local government to take out a lien against the property to recover expenses to correct violations

Residential Subdivision Issues

- Require the developer to post an erosion control deposit for each lot in a residential development (Plano)
- Require final stabilization of all disturbed ground prior to acceptance of infrastructure
- Require the land developer to maintain temporary and permanent erosion and sediment controls on all lots for which a building permit has not been issued (unless entire project transferred to one builder who would then assume the responsibility)
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- Require that all utilities be in place prior to acceptance of infrastructure

"(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices"

Note: These requirements can be included in the erosion and sediment control ordinance, or may be implemented by other procedural means such as engineering or drainage standards.

Coordination with Regional Program

- Require usage of best management practices (BMPs) detailed in the NCTCOG Construction BMP Manual
- Require NCTCOG Construction BMP Manual recommended 70% site rating (E&S plan designed to retain a minimum of 70% of potential sediment loss)

Erosion and Sediment Control Plan

- Require submission and approval of an erosion and sediment control (E&S) plan prior to earth disturbing activities; and/or
- Require submission of the Storm Water Pollution Prevention Plan (SWPPP) specified by the NPDES or TPDES construction permit
- Require E&S plan (or SWPPP) to be sealed by an licensed professional engineer
- Require E&S plan (or SWPPP) to reflect different phases of construction (clearing, grading, infrastructure, building, completion/landscaping)
- Provide a checklist to developers, engineers, and contractors with specific erosion and sediment control plan requirements

Best Management Practices

- Require BMPs to be installed and maintained as specified in the NCTCOG Construction BMP Manual
- Require disturbed area to be limited to the greatest extent possible
- Require specific approval and permanent stabilization measures for cut/fill slopes over 2:1
- Require specific approval for temporary stream crossings and construction activities in waterways

Practices for Individual Residential Lots

- Require a "limited" or "generic" erosion and sediment control plan as a condition of issuing a building permit
- Require a minimum of 8' of erosion control matting around perimeter of lot or adjacent to curb face and drainage swales

"(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality"

Waste Management Plans/Procedures

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- Require locations of waste containers, concrete washout facilities, chemical storage areas, refueling areas, sanitary facilities, and chlorinated water treatment facilities to be shown on appropriate plans (construction, E&S, SWPPP, etc.)

- Require waste collection areas to be located such that they do not receive substantial runoff from upland areas and do not drain directly to the MS4 (including streets) or receiving waters
- Require sanitary waste facilities (portable toilets) to be located a specified minimum distance (~10 to 20 feet) away from storm drain inlets and receiving waters; and/or
- Require containment for sanitary waste facilities (portable toilets)
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- Provide a checklist to developers, engineers, and contractors with waste management plan requirements
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- Require chemicals, paint, petroleum, fertilizer, and pesticide to be stored in a covered enclosure
- Require disposal of empty/unused chemical containers in accordance with label instructions (or provide more detailed local instructions)
- Require segregation of potentially hazardous and non-hazardous wastes
- Require spill control procedures and notification of the MS4

Construction Waste and Trash Management

- Require covered waste containers
- Require daily cleanup of construction site and placement of all waste and trash in approved containers
- Require disposal of all construction site wastes at authorized disposal facilities
- Require (or encourage) recycling of appropriate waste construction materials (Frisco)

"(D) Procedures for site plan review which incorporate consideration of potential water quality impacts"

Development Review Committee

- Implement a Development Review Committee to review applicable plans to ensure compliance with erosion and sediment/waste control requirements for all public and private construction projects
- Development Review Committee composition could include staff from engineering, public works, and environmental management as appropriate
- Require a tree survey to be included in the development plans

Pre-construction Meeting

- Require a pre-construction meeting for all public and private projects to outline sediment and erosion/waste control requirements to the developer and contractors
- Include inspector with responsibility for storm water inspection for the project in the pre-construction meeting

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- Conduct periodic meetings to educate companies involved in public and private construction in the jurisdiction on local pollution prevention requirements and procedures

- "(E) Procedures for receipt and consideration of information submitted by the public"

- Establish a "hotline" phone number for citizen complaints
- Establish a maximum time to investigate and report back to person making complaint
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"(F) Procedures for site inspection and enforcement of control measures"

Organization

- Use existing inspection organizations (engineering, public works, building) and incorporate inspection of erosion and sediment/waste controls into their normal functions; or
- Create a storm water or environmental management department with sole or primary responsibility for erosion and sediment/waste control inspections

Training and Materials

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- Provide a standard form with all inspection requirements for use on inspections

Inspection Frequency/Notification Requirements

- Establish appropriate frequencies for inspection of construction storm water BMPs for different types of development: residential subdivision infrastructure construction (once per week or two weeks, and/or at other required inspections); single family residence (at each code inspection); commercial construction (clearing, grading, code inspections); and/or
- Establish a general frequency of inspection of all active construction sites (i.e. all sites inspected at least once per month); and/or
- Establish priorities for inspections of construction sites depending on probable impact (size or type of development, proximity to sensitive receiving waters, etc.)
- Require notification from contractor prior to start or on completion of various stages of construction (start of clearing, completion of installation of BMPs, completion of clearing, completion of grading, completion of final landscaping, etc)

Procedures

- Establish procedures for notifying operators of violations and required corrective actions depending on the type of violation
- Establish allowable time for corrective action depending on severity of actual or likely impact on receiving waters as a result of violation
- Establish procedures for recordkeeping of inspections and compliance actions

Enforcement

Note: These measures can be used in addition to the sanctions included in the ordinance section above.

- Withhold payment on public projects (authority may need to be provided for in contract documents)
- Withhold building, plumbing, electrical, etc. inspection approvals (authority may need to be provided for in building ordinance)
- Utilize litter ordinance authority to require cleanup of construction sites

CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

Phase II Minimum Control Measure Requirements
and Items for Consideration

The italicized text included below is the language for the "Construction Site Storm Water Runoff Control" Minimum Measure taken from EPA's Final Phase II Rule. The Final Phase II Rule establishes the minimum requirements that TNRCC will use in drafting the corresponding storm water permit for small municipalities in Texas. Cities and counties should use these requirements in planning their storm water management programs until TNRCC issues the Texas permit (TNRCC must issue the Phase II municipal storm water permit by December 9, 2002).

In addition to the regulatory language, included under each of the EPA requirements is a list of items that are suggested by NCTCOG staff for consideration in developing the construction component of a municipal storm water management plan. These items were prepared based on EPA's Erosion and Sediment Control Model Ordinance, the EPA Construction General Permit for Region 6, and the construction management programs of local Phase I cities.

"Construction site storm water runoff control. (i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more."

"(ii) Your program must include the development and implementation of, at a minimum:"

"(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;"
"(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices"

Considerations

- Use separate sediment and erosion control ordinance or incorporate into broader stormwater ordinance
- Require submission of an erosion and sediment control plan (Storm Water Pollution Prevention Plan - SWPPP) prior to earth disturbing activities
- Require E&S plan/SWPPP to consider different phases of construction
- Require submission of modifications made to SWPPP
- Require contents of SWPPP to mirror those required by EPA's Construction General Permit
- Require usage of NCTCOG Construction BMP Manual
- Require Construction BMP Manual recommended 70% site rating (E&S plan designed to retain a minimum of 70% of potential sediment loss)
- Require site development permit
- Who is required to get the site development permit – contractor, owner?
- Require posting of bond to cover cost of restoration/final stabilization if operator defaults
- Require posting of a permit at the construction site
- Require contractor to inspect and maintain BMPs
- Penalties for noncompliance: dollar amount, single fine per infraction, per day fine, stop work order, revocation of permit

CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

Phase II Minimum Measure Considerations (Continued)

"(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality"

Considerations

- Require chemicals, paint, petroleum, fertilizer, and pesticide to be stored in covered enclosure
- Require proper disposal of empty/unused chemical containers
- Require segregation of potentially hazardous and non-hazardous wastes
- Require covered waste containers
- Require recycling of appropriate waste construction materials
- Require sanitary facilities
- Require designated concrete washout area/controls
- Require spill control procedures, notification

"(D) Procedures for site plan review which incorporate consideration of potential water quality impacts"

Considerations

- Require concept plan review to consider development/construction impacts prior to preparation of detailed engineering plans
- Integrate with development/construction plan review or conduct separate review
- Allowable time from application to approval or denial
- Submission requirements: sketch of certain scale for concept plan review (if required), detailed SWPPP for pre-construction approval, etc

"(E) Procedures for receipt and consideration of information submitted by the public"

Considerations

- Establishment of "hotline" phone number
- Maximum time to investigate and report back to person making complaint
- Procedures for recordkeeping for complaints and corrective actions taken

"(F) Procedures for site inspection and enforcement of control measures"

Considerations

- Prioritize inspection of sites depending on size or type of development
- Use existing inspection organizations (building, public works) or create new department
- Use the same inspectors for different stages of development and construction (clearing and grading, infrastructure, building construction)
- Percentage of construction sites to be inspected on an annual basis
- Require notification from contractor prior to start or on completion of various stages of construction: start of clearing, completion of installation of BMPs, completion of clearing, completion of grading, completion of final landscaping, etc
- Procedures for correction of inadequate installation, maintenance, or operation of erosion, sediment, and trash/debris controls
- Procedures for recordkeeping for inspections and compliance actions

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Storm Water Phase II Final Rule

Construction Site Runoff Control Minimum Control Measure

This fact sheet profiles the Construction Site Runoff Control minimum control measure, one of six measures that the operator of a Phase II regulated small municipal separate storm sewer system (MS4) is required to include in its storm water management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) permit. This fact sheet outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them. It is important to keep in mind that the small MS4 operator has a great deal of flexibility in choosing exactly how to satisfy the minimum control measure requirements.

Why Is The Control of Construction Site Runoff Necessary?

Polluted storm water runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the pollutants listed in Table 1, sediment is usually the main pollutant of concern. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. For example, excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

Table 1

Pollutants Commonly Discharged From Construction Sites
Sediment
Solid and sanitary wastes
Phosphorous (fertilizer)
Nitrogen (fertilizer)
Pesticides
Oil and grease
Concrete truck washout
Construction chemicals
Construction debris

What Is Required?

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The small MS4 operator is required to:

- ❑ Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;
- ❑ Have procedures for site plan review of construction plans that consider potential water quality impacts;
- ❑ Have procedures for site inspection and enforcement of control measures;
- ❑ Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);

- ❑ Establish procedures for the receipt and consideration of information submitted by the public; and
- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Suggested BMPs (i.e., the program actions/activities) and measurable goals are presented below.

What Are Some Guidelines for Developing and Implementing This Measure?

Further explanation and guidance for each component of a regulated small MS4's construction program is provided below.

Regulatory Mechanism

Through the development of an ordinance or other regulatory mechanism, the small MS4 operator must establish a construction program that controls polluted runoff from construction sites with a land disturbance of greater than or equal to one acre. Because there may be limitations on regulatory legal authority, the small MS4 operator is required to satisfy this minimum control measure only to the maximum extent practicable and allowable under State, Tribal, or local law.

Site Plan Review

The small MS4 operator must include in its construction program requirements for the implementation of appropriate BMPs on construction sites to control erosion and sediment and other waste at the site. To determine if a construction site is in compliance with such provisions, the small MS4 operator should review the site plans submitted by the construction site operator before ground is broken.

Site plan review aids in compliance and enforcement efforts since it alerts the small MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities. The tracking of sites is useful not only for the small MS4 operator's recordkeeping and reporting purposes, which are required under their NPDES storm water permit (see Fact Sheet 2.9), but also for members of the public interested in ensuring that the sites are in compliance.

Inspections and Penalties

Once construction commences, BMPs should be in place and the small MS4 operator's enforcement activities should begin. To ensure that the BMPs are properly installed, the small MS4 operator is required to develop procedures for site inspection and enforcement of control measures to deter infractions. Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality. Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties. To conserve staff resources, one possible option for small MS4 operators is to have these inspections performed by the same inspector that visits the sites to check compliance with health and safety building codes.

Information Submitted by the Public

A final requirement of the small MS4 program for construction activity is the development of procedures for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities. This provision is intended to further reinforce the public participation component of the regulated small MS4 storm water program (see Fact Sheet 2.4) and to recognize the crucial role that the public can play in identifying instances of noncompliance.

The small MS4 operator is required only to *consider* the information submitted, and may not need to follow-up and respond to every complaint or concern. Although some form of enforcement action or reply is not required, the small MS4 operator is required to demonstrate acknowledgment and consideration of the information submitted. A simple tracking process in which submitted public information, both written and verbal, is recorded and then given to the construction site inspector for possible follow-up will suffice.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Ordinance or other regulatory mechanism in place; procedures for information submitted by the public in place.
2 years.....	Procedures for site inspections implemented; a certain percentage rate of compliance achieved by construction operators.
3 years.....	Maximum compliance with ordinance; improved clarity and reduced sedimentation of local waterbodies.
4 years.....	Increased numbers of sensitive aquatic organisms in local waterbodies.

Are Construction Sites Already Covered Under the NPDES Storm Water Program?

Yes. EPA's Phase I NPDES storm water program requires operators of construction activities that disturb five or more acres to obtain a NPDES construction storm water permit. General permit requirements include the submission of a Notice of Intent and the development of a storm water pollution prevention plan (SWPPP). The SWPPP must include a site description and measures and controls to prevent or minimize pollutants in storm water discharges. The Phase II Final Rule similarly regulates discharges from smaller construction sites disturbing equal to or greater than one acre and less than five acres (see Fact Sheet 3.0 for information on the Phase II construction program).

Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure for the small MS4 program is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s.

To aid operators of regulated construction sites in their efforts to comply with both local requirements and their NPDES permit, the Phase II Final Rule includes a provision that allows the NPDES permitting authority to reference a "qualifying State, Tribal or local program" in the NPDES general permit for construction. This means that if a construction site is located in an area covered by a qualifying local program, then the construction site operator's compliance with the local program constitutes compliance with their NPDES permit. A regulated small MS4's storm water program for construction could be a "qualifying program" if the MS4 operator requires a SWPPP, in addition to the requirements summarized in this fact sheet.

The ability to reference other programs in the NPDES permit is intended to reduce confusion between overlapping and similar requirements, while still providing for both local and national regulatory coverage of the construction site. The provision allowing NPDES permitting authorities to reference other programs has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site runoff control minimum measure profiled here.

Is a Small MS4 Required to Regulate Construction Sites that the Permitting Authority has Waived from the NPDES Construction Program?

No. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity (see 122.26(b)(15)(i)), the small MS4 operator is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such construction sites.

For Additional Information

Contact

☞ U.S. EPA Office of Wastewater Management
- Phone: 202 260-5816
- E-mail: SW2@epa.gov
- Internet: www.epa.gov/owm/sw/phase2

Reference Documents

☞ Storm Water Phase II Final Rule Fact Sheet Series
- Internet: www.epa.gov/owm/sw/phase2

☞ Storm Water Phase II Final Rule (64 *FR* 68722)
- Internet: www.epa.gov/owm/sw/phase2
- Contact the U.S. EPA Water Resource Center
  - Phone: 202 260-7786
  - E-mail: center.water-resource@epa.gov

CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

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