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Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 450

[EPA–HQ–OW–2008–0465; FRL–8744–1]

RIN 2040–AE91

Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency is proposing a regulation that would strengthen the existing regulatory program for discharges from construction sites by establishing technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development (C&D) point source category. This proposal, if implemented, would significantly reduce the amount of sediment and other pollutants discharged from construction sites. EPA estimates that this proposed rule would cost $1.9 billion dollars per year with annual monetized benefits of $332.9 million. This proposed rule requests comment and information on the proposed regulation and an alternate option with a different numeric limit based on different technologies, as well as specific aspects of the proposal such as technologies, costs, loading reductions, and economic achievability.

DATES: Comments must be received on or before February 26, 2009.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OW–2008–0465, by one of the following methods:

- *http://www.regulations.gov:* This is EPA's preferred approach, although you may use the alternatives presented below. Follow the on-line instructions for submitting comments.
- *E-mail: OW-Docket@epa.gov.*
- *Mail:* USEPA Docket Center, Environmental Protection Agency, Docket Number EPA–HQ–OW–2008–0465, Mailcode 2822T, 1200 Pennsylvania Ave., NW., Washington, DC 20460.
- *Hand Delivery:* USEPA Docket Center, Public Reading Room, 1301 Constitution Ave., NW., Room 3334, EPA West Building, Washington DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OW–2008–0465. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov,* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the USEPA Docket Center, Public Reading Room, Room 3334, EPA West Building, 1301 Constitution Ave., NW., Washington DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–2426. Please note that several of the support documents are available at no charge on EPA's Web site; see Supporting Documentation below.

FOR FURTHER INFORMATION CONTACT: For technical information concerning today's proposed rule, contact Mr. Jesse W. Pritts at 202–566–1038 (*pritts.jesse@epa.gov*). For economic information contact Mr. Todd Doley at 202–566–1160 (*doley.todd@epa.gov*).

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 activities required to obtain NPDES permit coverage and performing the following activities:	
	Construction of buildings, including building, developing and general contracting	236
	Heavy and civil engineering construction, including land subdivision	237

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.

Supporting Documentation

Several key documents support the proposed regulation:

1. ''Development Document for Proposed Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–08–007. (''Development Document'') This document presents EPA's methodology and technical conclusions concerning the C&D category.

2. ''Economic Analysis for Proposed Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–08–008. (''Economic Analysis'') This document presents the methodology employed to assess economic impacts of the proposed rule and the results of the analysis.

3. ''Environmental Impact and Benefits Assessment for Proposed Effluent Guidelines and Standards for the Construction and Development Category,'' EPA–821–R–08–009 (''Environmental Assessment''). This document presents the methodology to assess environmental impacts and benefits of the proposed rule and the results of the analysis.

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 Web site for the C&D rule, *http://www.epa.gov/waterscience/guide/construction.*

Overview

This preamble describes the terms, acronyms, and abbreviations used in this document; the background documents that support these proposed regulations; the legal authority of this proposed rule; a summary of the proposal; background information; and the technical and economic methodologies used by the Agency to develop this proposed regulation. While EPA solicits comments on this entire proposal, EPA emphasizes specific areas of interest where we would particularly like comments, information and data.

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I. Legal Authority

EPA is proposing this regulation under the authorities of sections 301, 304, 306, 308, 402, 501 and 510 of the Clean Water Act (CWA), 33 U.S.C. 1311, 1314, 1316, 1318, 1342, 1361 and 1370 and pursuant to the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*

II. Purpose & Summary of the Proposed Rule

Despite substantial improvements in the nation's water quality since the inception of the Clean Water Act, 45 percent of assessed river and stream miles, 47 percent of assessed lake acres, and 32 percent of assessed square miles of estuaries show impairments from a wide range of sources. Improper control of stormwater discharges from construction activity is among the many contributors of sediment which is one of the major remaining water quality problems throughout the United States. Sediment is the leading cause of water quality impairment for streams and rivers. It is also one of the leading causes of lake and reservoir water quality impairment and wetland degradation. Turbidity and suspended solids are also major sources of water quality impairment nationwide. Turbidity or suspended solids impair 695,133 miles of streams nationwide. In addition, 376,832 acres of lakes and reservoirs have been documented as impaired by turbidity or suspended solids nationwide. The sediment and turbidity entrained in stormwater discharges from construction activity contributes to harm in aquatic ecosystems, increases drinking water treatment costs, and contributes to impairment to recreational uses of impacted waters. Sediment can also accumulate in rivers, lakes, and reservoirs, leading to the need for dredging or other mitigation.

Construction activity typically involves site selection and planning, and land-disturbing tasks such as clearing, excavating and grading. Disturbed soil, if not managed properly, can be easily washed off-site during storm events. Stormwater discharges generated during construction activities can cause an array of physical, chemical and biological impacts. Sediment discharges can cause an array of physical and biological impacts on receiving waters. In addition to sediment, a number of other pollutants (e.g., metals and nutrients) are preferentially absorbed or adsorbed onto mineral or organic particles found in fine sediment. These pollutants can cause an array of chemical and biological water quality impairments. The interconnected processes of erosion (i.e., detachment of soil particles by water), sediment transport, and delivery to receiving waters are the primary pathways for the addition of pollutants from construction and development (C&D) sites into aquatic systems.

A primary concern at most C&D 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 sediment to water bodies. Although streams and rivers naturally carry sediment loads, discharges from construction activity can elevate these loads to levels above those in undisturbed watersheds.

Existing national stormwater regulations at 40 CFR 122.26 require permittees to implement control measures to manage discharges associated with construction activity. Today's proposal would establish a technology-based ''floor'' or minimum requirements on a national basis. This rule would constitute the nationally applicable, technology-based effluent limitations guidelines (ELGs) and new source performance standards (NSPS) (referred to collectively in this notice as ''ELGs'' or ''effluent limitations guidelines,'' unless specifically referencing NSPS), applicable to all dischargers currently required to obtain a National Pollutant Discharge Elimination System (NPDES) permit pursuant to 40 CFR 122.26(b)(14)(x) and 122.26(b)(15). The proposed ELGs would require stormwater discharges from certain C&D sites to meet effluent limitations designed to reduce the amount of sediment, turbidity, Total Suspended Solids (TSS) and other pollutants in stormwater discharges from the site. EPA acknowledges that many state and local governments have existing effluent limitations and standards for controlling stormwater and wastewater discharges from construction sites. Today's proposed ELGs are intended to work in concert with these existing state and local programs. Today's proposed regulation would establish a numeric effluent limit for turbidity in discharges from some C&D sites. EPA envisions these turbidity effluent limits as requiring an additional layer of management practices and/or treatment above what most state and local programs are currently requiring. Permitting authorities would be required to incorporate these turbidity limitations into their permits and permittees would be required to implement control measures to meet a numeric turbidity limit in discharges of stormwater from their C&D sites. EPA is not dictating that a specific technology be used to meet the numeric limit, but is specifying the maximum turbidity level that can be present in discharges from C&D sites. However, EPA's proposed limits are based on its assessment of what specific technologies can reliably achieve. Permittees would have the flexibility to select management practices that are best suited to site-specific conditions present on each individual C&D site if they are able to consistently meet the limits.

III. Background on Existing Regulatory Program

A. Clean Water Act

Congress passed the Federal Water Pollution Control Act of 1972 (Pub. L. 92–500, October 18, 1972) (hereinafter the Clean Water Act or CWA), 33 U.S.C. 1251 *et seq.*, with the stated objectives 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 provides that ''the discharge of any pollutant by any person shall be unlawful'' except in compliance with other provisions of the statute. CWA section 301(a). U.S.C. 1311. The CWA defines ''discharge of a pollutant'' broadly to include ''any addition of any pollutant to navigable waters from any point source.'' CWA section 502(12). 33 U.S.C. 1362(12). EPA is authorized under CWA section 402(a) to issue a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of any pollutant from a point source notwithstanding Section 301(a). These NPDES permits are issued by EPA regional offices or NPDES authorized state or tribal agencies. Since 1972, EPA and the states have issued NPDES permits to thousands of dischargers, both industrial (e.g., manufacturing, energy and mining facilities) and municipal (e.g., sewage treatment plants). As required under Title III of the CWA, EPA has promulgated ELGs and standards for many industrial point source categories, and these requirements are incorporated into the permits.

The Water Quality Act of 1987 (Pub. L. 100–4, February 4, 1987) amended the CWA, adding CWA section 402(p) to require implementation of a comprehensive program for addressing stormwater discharges. 33 U.S.C. 1342(p). The NPDES program was expanded by requiring EPA or NPDES authorized states or tribes to issue NPDES permits for stormwater discharges listed under Section 402(p)(2), which include municipal and industrial stormwater discharges. Industrial stormwater dischargers, municipal separate storm sewer systems and other stormwater dischargers designated by EPA must obtain NPDES permits pursuant to CWA section 402(p). Stormwater discharges associated with industrial activity must meet all applicable provisions of CWA sections 301 and 402, including meeting technology-based effluent limitations.

B. NPDES Stormwater Permit Program

EPA's Phase I stormwater regulations promulgated in 1990 identified stormwater discharges associated with construction activity as one of several types of industrial activity requiring an NPDES permit. Dischargers must apply for and obtain authorization to discharge (or ''permit coverage'') (40 CFR 122.26(b)(14)(x) and (c)(1)). As described in the Phase I regulations, a permit is required for discharges associated with construction activity, including clearing, grading, and excavation, if the construction activity:

- 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.

EPA defines these ''large'' construction sites as one of the eleven categories of stormwater dischargers associated with industrial activity. (See 40 CFR 122.26(b)(14)).

The Phase II stormwater regulations, promulgated in 1999, extended permit coverage to construction activity that results in land disturbance of one acre or greater (40 CFR 122.26(b)(15)), including sites less than one acre that are part of a larger common plan of development or sale whose total land disturbing activities total more than an acre. EPA's NPDES regulations define these sites, *i.e.*, sites disturbing between one and five acres, as ''small'' construction sites.

In addition to requiring permits for discharges associated with construction activity, the NPDES regulations require permits for certain municipal separate storm sewer systems (MS4s). Operators of these MS4s, typically local governments, must develop and implement a stormwater management program, including a requirement to address stormwater discharges from construction activity. More details on the requirements of MS4 programs are described in section III.B.2.

1. Stormwater Permits for Construction Activity

The NPDES regulations provide two options for obtaining authorization to discharge or ''permit coverage'': General permits and individual permits. A brief description of these types of permits as they apply to construction sites follows.

a. General NPDES Permits

The vast majority of discharges from construction activity are covered under NPDES general permits. EPA, states and tribes use general permits to cover a group of similar dischargers under one permit. See 40 CFR 122.28. General permits simplify the process for dischargers to obtain authorization to discharge, provide permit requirements for any discharger that files a notice of intent to be covered, and reduce the administrative workload for NPDES permitting authorities. General permits, including a fact sheet describing the rationale for permit conditions, are issued by NPDES permitting authorities through public notice. Typically, to obtain authorization to discharge under a construction general permit, a discharger (typically, a developer, builder, or contractor) submits to the permitting authority a Notice of Intent (NOI) to be covered under the general permit. By submitting the NOI, the discharger acknowledges that it is eligible for coverage under the general permit and agrees to the conditions in the published general permit. Discharges from the construction activity are authorized consistent with the terms and conditions established in the general permit.

EPA regulations allow NPDES permitting authorities to regulate discharges from small C&D sites under a general permit without the discharger submitting an NOI if the permitting authority determines an NOI is inappropriate and the general permit includes language acknowledging that an NOI is unnecessary (40 CFR 122.28(b)(2)(v)). To implement such a requirement, the permitting authority must specify in the public notice of the general permit any reasons why an NOI is not required. In these instances, any stormwater discharges associated with small construction activity are automatically covered under an applicable general permit and the discharger is required to comply with the terms, conditions and effluent limitations of such permit.

Similarly, EPA, states and tribes have the authority to notify a C&D site operator that it is covered by a general permit, even if that operator has not submitted an NOI (40 CFR 122.28(b)(2)(vi)). In these instances, the operator is given the opportunity to request coverage under an individual permit. Individual permits are discussed in section III.B.1.d.

b. EPA Construction General Permit

Since 1992, EPA has issued a series of ''national'' Construction General Permits (CGP) that cover areas where EPA is the NPDES permitting authority. At present, EPA is the permitting authority in five states (Alaska, Idaho, Massachusetts, New Hampshire, and New Mexico), the District of Columbia, Puerto Rico, all other U.S. territories with the exception of the Virgin Islands, federal facilities in four states (Colorado, Delaware, Vermont, and Washington), most Indian lands and a couple of other specifically designated activities in specific states (e.g., oil and gas activities in Texas and Oklahoma). EPA issued a final ''national'' CGP on July 1, 2003 (63 FR 7898), modified on November 22, 2004 (changes effective January 21, 2005). EPA's current CGP became effective on June 30, 2008 (see 74 FR 40338). Following promulgation of the effluent limitations guidelines, EPA will issue a revised CGP incorporating the new ELGs.

The key component of EPA's CGP is the requirement to minimize discharges of pollutants in stormwater discharges using control measures that reflect best engineering practices. Dischargers must minimize their discharge of pollutants in stormwater using appropriate erosion and sediment control ''best management practices'' (BMPs) and control measures for other pollutants such as litter, construction debris, and construction chemicals that could be exposed to stormwater and other wastewater. The 2008 CGP requires dischargers to develop and implement a stormwater pollution prevention plan (SWPPP) to document the steps they will take to comply with the terms, conditions and effluent limitations of the permit. EPA's guidance manual, ''Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites,'' (EPA 833/R–060–04, May 2007; available on EPA's Web site at *http://www.epa.gov/npdes/stormwater*) describes the SWPPP process in detail. As detailed in EPA's CGP, the SWPPP must include a description of the C&D site with maps showing drainage patterns, discharge points, and locations of runoff controls; a description of the control measures used; and inspection procedures. A copy of the SWPPP must be kept on the construction site from the date of project initiation to the date of final stabilization. The CGP does not require permittees to submit a SWPPP to the permitting authority; however a copy must be readily available to authorized inspectors during normal business hours.

Other requirements in the CGP include conducting regular inspections and reporting releases of reportable quantities of hazardous substances.

To discontinue permit coverage, a discharger must either 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 the property to the homeowner. The permittee submits a Notice of Termination (NOT) Form to the permitting authority upon satisfying the appropriate permit termination conditions described in the CGP.

c. State Construction General Permits

Whether EPA, a state or a tribe issues the general permit, the CWA requires that NPDES permits must include technology-based effluent limitations. In addition, where technology-based effluent limitations are insufficient for the discharge to meet applicable water quality standards, the permit must contain water quality-based effluent limitations as necessary to meet those standards. See sections 301, 304, 303, 306, and 402 of the CWA. PUD No. 1 of *Jefferson County* v. *Washington Department of Ecology*, 511 U.S. 700, 704–705 (1994).

For the most part, state-issued general permits for stormwater discharges from construction activity have followed EPA's CGP format and content, starting with EPA's first CGP issued in 1992 (57 FR 41176; September 9, 1992). Over time, some states have changed components of their permits to better address the specific conditions encountered at construction sites within their jurisdiction (e.g., soil types, topographic or climatic characteristics, or other relevant factors). For example, Washington, Oregon and Vermont's CGPs include turbidity action levels and discharge monitoring requirements for C&D sites applicable to all or a subset of construction sites.

d. Individual NPDES Permits

A permitting authority may require any C&D site to apply for an individual permit rather than using the general permit. Likewise, any discharger may request to be covered under an individual permit rather than seek coverage under an otherwise applicable general permit (40 CFR 122.28(b)(3)). Unlike a general permit, an individual permit is intended to be issued to one permittee, or a few co-permittees. Individual permits for stormwater discharges from construction sites are rarely used, but when done so, are most often used for very large projects or projects located in sensitive watersheds. EPA estimates that fewer than one half of one percent (< 0.5%) of all construction sites are covered under individual permits.

2. Municipal Stormwater Permits and Local Government Regulation of Stormwater Discharges Associated With Construction Activity

Many local governments, as MS4 permittees, have a role to play in the regulation of construction activities. This section provides an overview of MS4 responsibilities associated with controlling stormwater discharges from construction activity.

a. NPDES Requirements

A municipal separate storm sewer system (MS4) is a conveyance or system of conveyances designed or used for collecting or conveying stormwater. These systems are not combined sewers and not part of a Publicly Owned Treatment Works (POTW). See 40 CFR 122.26(b)(8). A municipal separate storm sewer system (MS4) is all large, medium, and small municipal storm sewers or those designated as such under the regulations. See 40 CFR 122.26(b)) (18). The NPDES stormwater regulations require many MS4s to apply for permits. In general, the 1990 Phase I rule requires MS4s serving populations of 100,000 or more to obtain coverage under an MS4 individual permit. See 40 CFR 122.26(a)(3). The 1999 Phase II rule requires most small MS4s located in urbanized areas also to obtain coverage. See 40 CFR 122.33. The Phase II regulations also provide permitting authorities with the authority to designate any additional MS4s located outside of urbanized areas for permit coverage where the permitting authority determines that storm water controls are needed for the discharge based on wasteload allocations that are part of total maximum daily loads that address pollutants of concern or the permitting authority or the EPA Regional Administrator determines that the discharge, or category of discharges within a geographic area, contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. 40 CFR 122.26(9)(i)(C) and (D). Regardless of the type of permit, MS4s are required to develop stormwater management programs that detail the procedures they will use to control discharges of pollutants in stormwater from the MS4.

Both the Phase I and II rules require regulated municipalities to develop comprehensive stormwater management programs which include, among other elements, the regulation of discharges from construction sites. The Phase I regulations require medium and large MS4s to implement and maintain a program to reduce pollutants in stormwater runoff from construction sites, including procedures for site planning, requirements for structural and non-structural BMPs, procedures for identifying priorities for inspecting sites and enforcing control measures, and development and dissemination of appropriate educational and training materials. In general, the Phase II regulations require small MS4s to develop, implement, and enforce a program to control pollutants in stormwater runoff from construction activities which includes developing an ordinance to require implementation of erosion and sediment control practices, to control waste and to have procedures for site plan review and site inspections. Thus, as described above, both the Phase I and Phase II regulations specifically anticipate a local program for regulating stormwater discharges from construction activity. See 40 CFR 122.26(d)(2)(iv)(D) for Phase I MS4s and 40 CFR 122.34(b)(4) for Phase II MS4s. EPA has provided many guidance materials to the NPDES permitting authorities and MS4s that recommend components and activities for a well-operated local stormwater management program.

EPA promulgated two provisions intended to minimize potential duplication of requirements or inconsistencies between requirements. First, 40 CFR 122.35 provides that a small MS4 is allowed to rely on another entity to satisfy its NPDES permit obligations, including construction site control, provided the other entity implements a program that is at least as stringent as the corresponding NPDES permit requirements and the other entity agrees to implement the control measures on the small MS4's behalf. Thus, for example, where a county implements a construction site stormwater control program already, and that program is at least as stringent as the controls required by a small MS4's NPDES permit, the MS4 may reference that program in the Notice of Intent to be covered by a general permit, or in its permit application, rather than developing and implementing a new program to require control of construction site stormwater within its jurisdiction.

Similarly, EPA or the state permitting authority may substitute certain aspects of the requirements of the EPA or state permit by incorporating by reference the requirements of a ''qualifying local program'' in the EPA or state CGP. A ''qualifying local program'' is an existing sediment and erosion control program that meets the minimum requirements as established in 40 CFR 122.44(s). By incorporating a qualifying local, state or tribal program into the EPA or state CGP, construction sites covered by the qualifying program in that jurisdiction would simply follow the incorporated local requirements in order to meet the corresponding requirements of the EPA or state CGP.

b. EPA Guidance to Municipalities

EPA developed several guidance documents for 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 MS4s as to the types of practices they could use to develop and implement their stormwater management programs. The menu includes descriptions of practices that local programs can implement to reduce impacts of stormwater discharges from construction activities.
- Measurable Goals Guidance for Phase II MS4s (*http://www.epa.gov/npdes/stormwater/measurablegoals*). This document assists small MS4s in defining performance targets and

includes examples of goals for practices to control stormwater discharges from construction activities.

• 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 stormwater discharges affected by the Phase II rule.

• Fact Sheets on various stormwater 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), swales (EPA 832–F–99–006) and wet detention ponds (EPA 832–F–99–048). (Available at *http://www.epa.gov/npdes/stormwater/*; click on ''Publications.'')

C. Other State and Local Stormwater Requirements

States and municipalities may have other requirements for flood control, erosion and sediment control, and in many cases, stormwater management. Many of these provisions were enacted before the promulgation of the EPA Phase I stormwater rule although many have been updated since. An EPA analysis found that all states have laws for erosion and sediment control measures, with these laws implemented by state, county, or local governments. A summary of existing state requirements is provided in the Development Document.

D. Technology-Based Effluent Limitations Guidelines and Standards

Effluent limitation guidelines and new source performance standards are technology-based effluent limitations required by CWA sections 301 and 306 for categories or subcategories of point source dischargers. These limitations, which can be either numeric or non-numeric, along with water quality-based effluent limitations, if necessary, are incorporated into NPDES permits. ELGs and NSPS are based on the degree of control that can be achieved using various levels of pollutant control technology, as defined in Title III of the CWA and outlined below.

1. Best Practicable Control Technology Currently Available (BPT)

In establishing effluent guidelines for a point source category, the CWA requires EPA to specify BPT effluent limits for conventional, toxic, and nonconventional pollutants. In doing so, EPA is required to determine what level of control is technologically available and economically practicable. CWA section 301(b)(1)(A). In specifying BPT, the CWA requires EPA to look at a number of factors. EPA 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 Administrator 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 practicably applied. See e.g., *American Frozen Foods Inst.* v. *Train*, 539 F.2d 107, 117 (D.C. Cir. 1976).

EPA assesses cost-reasonableness of BPT limitations by considering the 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.'' Moreover, the inquiry does not require the Agency to quantify benefits in monetary terms. See, e.g., *American Iron and Steel Institute* v. *EPA*, 526 F. 2d 1027, 1051 (3rd Cir. 1975).

In balancing costs against the effluent reduction, EPA considers the volume and nature of expected discharges after application of BPT, the general environmental effects of pollutants, and the cost and economic impacts of the required level of pollution control. In past effluent limitation guidelines, BPT cost-reasonableness comparisons ranged from $0.26 to $41.44 per pound removed in year 2008 dollars. This range is not inclusive of all categories regulated by BPT, but nonetheless represents a very broad range of cost-reasonableness values. About half of the cost-reasonableness values represented by this range are less than $2.50 per pound (in 2001 dollars). In developing guidelines, the Act does not require consideration of water quality problems attributable to particular point sources, nor does it require consideration of water quality improvements in particular bodies of water. See *American Frozen Foods Inst.* v. *Train*, 539 F.2d 107, 117 (D.C. Cir. 1976); *Weyerhaeuser Company* v. *Costle*, 590 F. 2d 1011, 1036, 1041–44 (D.C. Cir. 1978).

2. Best Available Technology Economically Achievable (BAT)

BAT effluent guidelines are applicable to toxic (priority) and nonconventional pollutants. EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. 40 CFR 401.15 and 40 CFR part 423, Appendix A. In general, BAT represents the best available performance of direct discharging facilities in the subcategory or category. CWA section 304(b)(2)(A). 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. CWA section 304(b)(2). The Agency retains considerable discretion in assigning the weight to be accorded to these factors. *Natural Resources Defense Council* v. *EPA*, 863 F.2d 1420, 1426 (9th Cir. 1988). An additional statutory factor considered in setting BAT is ''economic achievability.'' EPA may determine the economic achievability of an option 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. See *Texas Oil & Gas Ass'n* v. *EPA*, 161 F.3d 923, 928 (5th Cir. 1998) (citing ''process changes'' as one factor EPA must consider in determining BAT); see also, *American Meat Institute* v. *EPA*, 526 F.2d 442, 464 (7th Cir. 1975). As with BPT, where existing performance is uniformly inadequate, EPA may base BAT upon technology transferred from a different subcategory or from another category. See *CPC International Inc.* v. *Train*, 515 F.2d 1032, 1048 (8th Cir. 1975) (established criteria EPA must consider in determining whether technology from one industry can be applied to another); see also, *Tanners' Council of America, Inc.* v. *Train*, 540 F.2d 1188 (4th Cir. 1976). In addition, the Agency may base BAT upon manufacturing process changes or internal controls, even when these technologies are not common industry practice. See *American Frozen Foods Inst.* v. *Train*, 539 F.2d 107, 132 (D.C. Cir. 1976).

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 CWA section 304(b)(4)(B), the Act 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. 40 CFR 401.16. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979 (44 FR 44501).

4. New Source Performance Standards (NSPS)

NSPS reflect effluent reductions that are achievable based on the best available demonstrated control technology. New sources, as defined in CWA section 306, 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, nonconventional, 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 standards are known as Pretreatment Standards for Existing Sources (PSES) and Pretreatment Standards for New Sources (PSNS), and are promulgated under CWA section 307(b). EPA has no data indicating that construction sites typically discharge directly to POTWs. Therefore, EPA is not proposing PSES or PSNS for the C&D category. EPA determined that the majority of construction sites discharge either directly to waters of the U.S. or through MS4s. In some urban areas, construction sites may discharge to combined sewer systems (i.e., sewers carrying both stormwater and domestic sewage through a single pipe) which lead to POTWs. Sediment and turbidity, which are the primary pollutants associated with construction site discharges, are susceptible to treatment in POTWs, using technologies commonly employed such as primary clarification. EPA has no evidence that construction site discharges to POTWs would cause interference, pollutant pass-through or sludge contamination.

6. EPA Authority to Promulgate Non-Numeric Effluent Limitations

The regulatory options proposed today include non-numeric effluent limitations that will control the discharge of pollutants from C&D sites. It is well established that EPA has the authority to promulgate non-numeric effluent limitations in addition to or in lieu of numeric limits. The CWA does not mandate the use of numeric limitations only and EPA's position finds support in the language of the CWA. The definition of ''effluent limitation'' means ''any restriction * * * on quantities, rates, and concentrations of chemical, physical, biological, and other constituents * * *'' CWA section 502(11).

Federal courts have recognized the CWA does not mandate that EPA use numeric effluent limitations. In *Citizens Coal Council* v. *U.S. EPA*, 447 F3d 879, 895–96 (6th Cir. 2006), the Sixth Circuit, in upholding EPA's use of non-numeric effluent limitations, agreed with EPA that it derives authority under CWA sections 402(a), 304(b) and 502(11) to incorporate non-numeric effluent limitations for conventional and non-conventional pollutants. The Sixth Circuit further held as reasonable the Agency position that CWA sections 304(b), 304(e) and 502(11), read together, allow non-numeric effluent limitations to supplement CWA section 304(b), or can stand as effluent limitations themselves. See also, *Waterkeeper Alliance, Inc.* v. *U.S. EPA*, 399 F.3d 486, 496–97, 502 (2d Cir. 2005) (EPA use of non-numerical effluent limitations in the form of best management practices are effluent limitations under the CWA); *Natural Res. Def. Council, Inc.* v. *EPA*, 673 F.2d 400, 403 (D.C. Cir. 1982) (''section 502(11) [of the CWA] defines 'effluent limitation' as 'any restriction' on the amounts of pollutants discharged, not just a numerical restriction.''); *Natural Res. Def. Council, Inc.* v. *Costle*, 568 F.2d 1369 (D.C. Cir. 1977) (in determining EPA did not have the authority to exclude a particular point source from the NPDES program, the Court held ''when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than fine-tuning suggested by numerical limitations.'')

EPA's NPDES regulations reflect EPA's long standing interpretation, as supported by federal court decisions, that the CWA allows for non-numeric effluent limitations. 40 CFR 122.44(k).

7. 2002 Construction and Development Proposal and Subsequent Litigation

EPA identified the C&D industry in its CWA section 304(m) plan in 2000 as an industrial point source category for which EPA intended to conduct rulemaking. 65 FR at 53,008 and 53,011 (August 31, 2000). On June 24, 2002, EPA published a proposed rule that contained several options for the control of stormwater discharges from construction sites, including ELGs and NSPS. (67 FR 42644; June 24, 2002).

On April 26, 2004, EPA determined that national effluent limitations guidelines would not be the most effective way to control discharges from construction sites, and instead chose to rely on the range of existing programs, regulations, and initiatives that already existed at the federal, state and local level. (69 FR 22472; April 26, 2004).

On October 6, 2004, the Natural Resources Defense Council, Inc. and additional plaintiffs filed a complaint in district court alleging that EPA's decision not to promulgate ELGs and NSPSs for the C&D industry violated a mandatory duty under the CWA. The district court, in *NRDC* v. *EPA*, 437 F.Supp.2d 1137, 1139 (C.D. Cal. 2006), held that CWA section 304(m) imposes on EPA a mandatory duty to promulgate ELGs and NSPSs for new industrial point source categories named in a CWA section 304(m) plan. The district court enjoined EPA to propose ELGs and NSPSs for the C&D industry by December 1, 2008 and to promulgate ELGs and NSPSs as soon as practicable, but in no event later than December 1, 2009. On appeal, the *Ninth Circuit in NRDC* v. *EPA*, 2008 WL 4253944 (9th Cir. 2008) affirmed the district court's decision holding that ''* * * the CWA is unambiguous that the EPA must promulgate ELGs and NSPSs for the point-source categories listed in a plan pursuant to [section] 304(m) * * *'' The deadline to seek re-hearing in the Ninth Circuit was November 3, 2008. The Agency requested a 30-day extension of the re-hearing deadline, which was granted, thus the new deadline for EPA to seek re-hearing is December 3, 2008.

IV. Scope of the Proposal

EPA is proposing a regulation that would strengthen the existing controls on discharges from construction activity by establishing technology-based effluent limitations guidelines and new source performance standards for the C&D point source category. This proposal, if implemented, would significantly reduce the amount of sediment, TSS, turbidity and other pollutants discharged from construction sites due to construction activities. EPA estimates that today's proposed rule would cost $1.9 billion dollars per year. These estimates do not include costs for Alaska, Hawaii and the U.S. territories because EPA lacked data on the amount of construction occurring in these areas. However, EPA does expect that some construction sites in these areas would incur compliance costs as a result of today's proposal. EPA solicits data that can be used to estimate the number of acres of construction activity that occurs annually in these areas.

The proposed rule would establish a set of non-numeric effluent limitations requiring dischargers to provide and maintain effective erosion control measures, sediment control measures, and other pollution prevention measures to minimize and control the discharge of pollutants in stormwater and other wastewater from construction sites. The rule would specify particular minimum BMPs to meet the effluent limitations requiring effective erosion control and pollution prevention.

In addition, reflecting current requirements in the EPA CGP, sites disturbing 10 or more acres at one time would be required to install a sediment basin to contain and settle sediment from stormwater runoff. The proposed rule would require minimum standards of design for sediment basins; however, alternatives that control sediment discharges in a manner equivalent to sediment basins would be authorized where approved by the permitting authority.

Finally, reflecting the BAT and NSPS levels of control, for certain large sites located in areas of high rainfall energy and with soils with significant clay content, discharges of stormwater from the site would be required to meet a numeric effluent limit on the allowable level of turbidity. The numeric turbidity limit is 13 nephelometric turbidity units (NTUs). The turbidity limit is intended to remove fine-grained and slowly settling or non-settleable particles contained in stormwater. Particles such as clays and fine silts contained in stormwater discharges from C&D sites typically cannot be effectively removed by conventional stormwater BMPs (such as sediment basins and sediment traps) that rely solely on settling unless sufficient detention time or additives are implemented. The technology basis for the turbidity limit is active treatment systems (ATS), which consists of polymer-assisted clarification followed by filtration.

In addition to this proposed option, EPA is specifically soliciting comment on setting a turbidity limit in the range of 50 to 150 NTUs (or some other number) based on passive treatment, instead of ATS. See section IX.A.5.a of today's proposal for additional discussion of this alternative approach.

EPA considered several other regulatory approaches while developing this proposed rule, such as specifying certain design criteria for sediment basins, or using different site size, rainfall, or soil type thresholds for determining which sites would be required to comply with a turbidity limit. EPA also considered setting BAT and NSPS equal to the proposed BPT level of control, based on non-numeric BMP-based effluent limitations, as well as an expanded version of today's proposed rule. EPA requests comment on these alternative regulatory approaches. Details of the proposed rule and alternative approaches considered are described in this notice, the Development Document, Economic Analysis, and Environmental Assessment (see the Supporting Documentation section of this notice) and additional documentation is contained in the record.

V. Overview of the Construction and Development Industry and Construction Activities

The C&D point source category covers firms classified by the Census Bureau into two North American Industry Classification System (NAICS) codes.

- Construction of Buildings (NAICS 236) includes residential, nonresidential, industrial, commercial and institutional building construction.
- Heavy and Civil Engineering Construction (NAICS 237) includes utility systems construction (water and sewer lines, oil and gas pipelines, power and communication lines); land subdivision; highway, street, and bridge construction; and other heavy and civil engineering construction.

Other types of entities not included in this list could also be regulated.

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. In typical construction projects, the firms identifying themselves as ''operators'' under a construction general permit are usually general building contractors or developers. While the projects often engage the services of specialty contractors such as excavation companies, these specialty firms are typically subcontractors to the general building contractor and are not separately identified as operators in stormwater permits. Other classes of subcontractors such as carpentry, painting, plumbing and electrical services typically do not apply for, nor receive, NPDES permits. The types and numbers of firms in the construction industry are described in more detail in the Development Document and the Economic Analysis.

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 may be hauled away. Clearing activities involve the movement of materials from one area of the site to another or complete removal from the site. When grading a site, builders typically take measures to ensure that new grades are as close to the original grade as possible to reduce erosion and stormwater runoff. Proper grade also ensures a flat surface for development and is designed to attain proper drainage away from the constructed buildings. A wide variety of equipment is often used during excavation and grading. 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, and compaction is often accomplished with various types of rollers. If rock is to be removed from the site, the contractor must first loosen and break the rock into small pieces using various types of drilling equipment or explosives. (Adapted from Peurifoy, Robert L. and Oberlender, Garold D. (1989). Estimating Construction Costs (4th ed.). New York: McGraw Hill Book Company.)

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. During construction activity, the disturbed land can remain exposed without vegetative cover for a substantial period of time. Where the soil surface is unprotected, soil particles and other pollutants are particularly susceptible to erosion and may be easily washed away by rain or snow melt and discharged from the site. Permittees typically use a combination of erosion and sediment control measures designed to prevent mobilization of the soil particles and capture of those particles that do mobilize and become entrained in stormwater from the C&D site. In most cases these control measures take the form of BMPs, but in some cases construction sites actively treat a portion of the discharge using filtration or other treatment technologies. Erosion and sediment control measures are described further in the Development Document.

VI. Summary of Data Collection Activities

In developing today's proposal, EPA gathered and evaluated technical and economic data from various sources. EPA also used data collected previously to develop the 2002 proposed C&D rule and the 2004 withdrawal of the proposed rule.

EPA used these data to estimate costs, pollutant loading reductions, environmental benefits and economic impacts of various regulatory options. This section summarizes EPA's data collection efforts.

A. State Data

EPA compiled and evaluated existing state program information about the control of construction site stormwater. EPA collected data by reviewing state construction general permits, Web sites, summary references, state regulations, and erosion and sediment control design and guidance manuals. A summary of criteria and standards for construction site stormwater erosion and sediment control that are implemented by states are presented in Appendix A of the Development Document for this proposed rulemaking. EPA did not collect information from counties or municipalities regarding current construction site stormwater requirements. EPA relied on state-level requirements to characterize requirements in all areas of the state. So, if county or municipal requirements are more stringent than state-level requirements for control of construction site stormwater discharges, EPA's baseline estimates of costs and pollutant reductions would not reflect these more stringent requirements currently in place. Therefore, certain components of EPA's cost and loadings estimates for the regulatory options may be overestimates. In addition, EPA did not account for those sites that would already be required to meet a turbidity limit. For example, some construction sites around the country are already required to meet numeric effluent limits for turbidity that are comparable to EPA's proposed turbidity limit. EPA has not accounted for these sites in its analysis of costs and loading reductions, although the number of these sites is likely to be only a small fraction of construction sites nationwide.

B. National Land Cover Dataset (NLCD)

The NLCD provides a national source of data on land cover. EPA used these data to estimate the amount of land across the U.S. that was converted to development (e.g., from forest or farmland to residential communities), which in turn was used to estimate the amount of acreage that may be subject to the requirements of the C&D rule.

The Multi-Resolution Land Characteristics Consortium (MRLC) has produced the NLCD datasets that created a 30-meter resolution land cover data layer over the conterminous United States using remote sensing data. There are approximately 24 billion data points from remote sensing data that comprise the NLCD database. NLCD data is publicly available for the years 1992 and 2001.

Due to new developments in mapping methodology, new sources of input data, and changes in the mapping legend for the 2001 National Land Cover Database (NLCD 2001), direct comparison between NLCD 2001 and the 1992 National Land Cover Dataset (NLCD 1992) is difficult. Thus, MRLC prepared the NLCD 1992/2001 Land Cover Change Product (see *http://www.mrlc.gov/change_detection.asp*). The NLCD 1992/2001 Land Cover Change Product was developed to offer more accurate direct change analysis between the two products. This land cover change map and all documents pertaining to it are considered ''provisional'' until a formal accuracy assessment can be conducted. Detailed definitions and discussion of the NLCD 1992/2001 Land Cover Change Product is summarized in the Development Document.

EPA estimated the annual number of acres of land converted to development in the U.S. and used that estimate as a surrogate measure of the acres of construction activities subject to national effluent guidelines regulations, since no national database of the number and size of construction activities exists. EPA used estimates of the amount of construction activity occurring in each state based on NLCD data as a basis for calculating state-level compliance costs. NLCD data was also used to estimate the amount of construction activity occurring in each of the watersheds in the U.S. based on the EPA Reach File cataloging system (discussed below). Watershed level data (along with other data sources) was used to estimate the quantity of construction activities and the associated pollutant loads occurring in each watershed and to link these loads to stream reaches for modeling of water quality improvements and benefits estimates.

C. Enhanced River Reach File 1.2 (ERF1)

EPA used the EPA Reach File 1.2 dataset (ERF1) to summarize land cover change in drainage area units (or watersheds). ERF1 for the Conterminous United States is a vector database of approximately 700,000 miles of streams and open waters in the conterminous United States. ERF1 was prepared by EPA in 1982 from National Oceanographic and Atmospheric Administration (NOAA) aeronautical charts having a scale of 1:500,000. ERF1 contains 67,171 watersheds with a minimum size of 247 acres (1 km^2) and an average size of 30,182 acres (122 km^2). ERF1 serves as the foundation for SPARROW (Spatially Referenced Regressions [of nutrient transport] on Watershed) modeling (see Section XIV of this proposal for a discussion of SPARROW).

D. NPDES Notice of Intent (NOI) Data

As stated above, when a discharger wishes to be authorized to discharge under a general permit, it files a NOI to be covered under the general permit. EPA used NOI data to estimate the distribution of construction activity by site size and development type. Using NOI data, EPA broadly characterized the construction industry into three land use types (residential construction, non-residential construction and road/highway construction). Differentiation of construction activities by site size and project type was also done for EPA's technical and economic analyses. EPA used NOI data from approximately 138,000 permit applications, containing data from 38 States for construction activities occurring primarily between the mid-1990s and 2006. Depending on the state, the number of NOI records available ranged from fewer than 10 to more than 10,000. The data are available either from a database of permits processed directly by EPA (referred to as the EPA NOI database) or from per-state databases obtained independently.

E. Soils Data

EPA used the State Soil Geographic (STATSGO) data compiled by Penn State University (*http://www.soilinfo.psu.edu/*) in order to estimate variation in soil types nationwide. The variation in soil types found within the United States is a significant factor in estimating sediment discharges, pollutant load reductions, and stormwater pollution prevention costs for construction sites. EPA used the STATSGO soils data in support of the loadings and removal estimates for this proposal. EPA used the Revised Universal Soil Loss Equation (RUSLE) in combination with the soils data to determine soil erosion rates from model construction sites in different areas of the country. EPA used these estimates, in combination with estimates of pollutant removal efficiencies for the various technologies evaluated, to estimate sediment discharges from C&D sites under baseline conditions and under each regulatory option evaluated. Although EPA was not able to find a national database of measured sediment concentrations in treated and untreated construction site stormwater runoff, EPA did find monitoring data from several states and compared these measured concentrations to the estimate concentration based on RUSLE. A discussion of this comparison is provided below in section IX. F. Additional details on the soil data collected can be found in the Development Document.

F. NOAA Rainfall Data

Variations in rainfall depth and intensity are also important factors in determining erosion rates, sediment discharges, pollutant load reductions and control technology costs for construction sites. In order to account for variations in rainfall patterns, EPA collected rainfall data for one indicator city within each of the 48 conterminous states. Data for each of these indicator cities were used as point estimates for estimating rainfall depths and intensities for construction activities for the entire state. A major urban area was chosen as the indicator city in each state; which in most cases was the capital city.

For each indicator city, precipitation data was gathered and analyzed using the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Precipitation Frequency Data Server (PFDS), NOAA Atlas 14, a series of maps presented in older NWS publications, and NOAA Atlas 2 (Precipitation Frequency Atlas of the Western United States (1973)). Alaska and Hawaii, as well as the U.S. territories, were not included in this analysis because EPA lacked sufficient data on the annual amount of construction occurring in these areas. More details on EPA's analysis can be found in the Development Document.

G. Parameter Elevation Regressions on Independent Slopes Model (PRISM)

PRISM is a climate mapping system that was used to estimate the annual acres that would be subject to the regulatory options given various annual rainfall cutoffs. Using PRISM GIS layers of average annual precipitation along with RF1-level estimates of annual acres of new construction, EPA was able to estimate acres that would be subject to various regulatory options given various average annual precipitation cutoffs.

H. Revised Universal Soil Loss Equation (RUSLE) R Factors

EPA used maps of rainfall-runoff erosivity factors (or R factors) contained in the RUSLE documentation. These maps, in GIS form, along with RF1-level estimates of annual acres of new construction, were used to estimate acres that would be subject to regulations given various R factor values.

I. Economic Data

EPA utilized various economic data sources in developing today's proposal. The primary data source is the 2002 Economic Census, conducted every five years by the U.S. Census Bureau. The U.S. Small Business Administration (SBA) and Census Bureau also provide important information in Statistics of U.S. Business (SUSB). SUSB provides firm-level data that is particularly important for the firm and industry impact assessment and for the small entity analysis. An important source of project level data is Reed Construction, a commercial construction industry data service that collects and reports information on multifamily, commercial/institutional, and industrial construction projects undertaken nationally. EPA assigned baseline financial characteristics—balance sheet, income statement, and metrics of financial performance and condition—to each of the model firms as defined by NAICS sector and revenue size range, from financial statement information reported by Risk Management Association's (RMA) publication, Annual Statement Studies. The Census Bureau's 2006 American Community Survey (ACS) was used to characterize new home prices and lot sizes (2006 was chosen because it is the most recent year for which the required Metropolitan Statistical Area (MSA)-level data are available from the Census).

VII. Characteristics of Discharges From Construction Activity

The nature of construction activity is that it changes, often significantly, many elements of the natural environment. Typically, construction activities involve clearing the land of vegetation, digging, earth moving and grading, followed by the active construction period when the affected land is usually left denuded and the soil compacted, often leading to an increase in the peak discharge rate and the total volume of stormwater discharged and higher rates of erosion. 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. Typically, the water carrying these particles eventually reaches a water body.

Discharges from construction activity have been documented to increase the loadings of several pollutants in the receiving waterbodies. The most prominent and most widespread pollutant discharged from C&D sites is sediment. The level of sediment is often identified through the measurement of the pollutants' turbidity, suspended solids, total suspended solids (TSS), suspended sediment concentration (SSC), and/or settleable solids. CWA section 304(a)(4) identified suspended solids as a conventional pollutant and in 1978 EPA defined ''suspended solids'' as ''total suspended solids (non-filterable) (TSS)'' and stated that TSS ''is a laboratory measure of the organic and inorganic particulate matter in wastewater which does not pass through a specified glass filter disk.'' See 40 CFR

401.16; 43 FR 32857, 32858 (July 28, 1978). Turbidity and settleable solids are non-conventional pollutants. See CWA section 301(b)(2)(F); 304(a)(4); *Rybachek* v. *EPA,* 904 F.2d 1276, 1291–92 (9th Cir. 1990). The Agency defined ''turbidity'' as ''an expression of the optical property that causes light to be scattered and absorbed rather than transmitted with no change in direction of flux level through the sample * * * caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter and plankton and other microscopic organisms.'' 40 CFR 136.3; 72 FR 11200, 11247 (March 12, 2007). (See Section IX for a discussion of why EPA proposes turbidity as the desired pollutant to control in determining the appropriate technology).

Stormwater discharges can have highly variable levels of pollutants. Available data show that turbidity levels range from as low as 10–50 NTU to several thousand NTU. When the denuded and exposed areas contain nutrients, pathogens, metals or organic compounds, these other pollutants are likely to be carried at increased rates (relative to discharges from undisturbed areas) to surrounding waterbodies via stormwater and other discharges (e.g., inadequately controlled construction equipment wash water). Discharges of these pollutants from construction activities can cause changes in the physical characteristics of waterbodies, such as pH, water temperature, or stream flow velocity, as well as changes in biological characteristics such as aquatic species abundance and composition.

Actions taken to stabilize disturbed areas of the C&D site can include seeding to restore vegetative cover. When fertilizers or herbicides are applied to these areas, a portion of the chemicals applied may become entrained in stormwater and will be discharged from the site. Fertilizers contribute nutrients such as nitrogen and phosphorus to the wastestream.

Discharges from construction activity are expected to contain varying concentrations of metals, some of which may be contributed by equipment used onsite for grading and other construction activities. Metals are also naturally present in soils and, by removing vegetative cover and increasing erosion and sediment loss, there will likely be an increase in the amount of metals discharged from the C&D site. Metals present as a contaminant or additive in fertilizers and other soil amendments may serve as another source of pollutants in the stormwater discharge.

Fuels and lubricants are maintained onsite to refuel and maintain vehicles and equipment used during construction activities. These products, should they come in contact with stormwater and other site discharges, would contribute toxic organic pollutants. Pathogenic pollutants can be present in stormwater that comes into contact with sanitary wastes where portable sanitation facilities are poorly located or maintained.

The environmental impacts associated with discharges from construction sites are described in section XIV.

VIII. Description of Available Technologies

A. Introduction

As described in Section VII, construction activity results in the discharge of pollutants to waters of the U.S. These discharges can be controlled by applying site design techniques that preserve or avoid areas prone to erosion and through the effective use of a combination of erosion and sediment control measures. Construction activities should be managed to reduce erosion and retain sediment on the C&D 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, which 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 control measures are intended to minimize dislodging and mobilizing of sediment particles. Sediment control measures are controls that serve to capture particles that have mobilized and are entrained in stormwater, with the objective of removing sediment and other pollutants from the stormwater discharge. An overview of available technologies and practices is presented below; see the Development Document for more complete descriptions. Many states and local governments and other entities have also published detailed manuals for erosion and sediment control measures, and other stormwater management practices.

B. Erosion Control Measures

The use of erosion control measures is widely recognized as the most important means of limiting soil detachment and mobilization of sediment. The controls described in this notice are designed to reduce mobilization of soil particles and minimize the amount of sediment and other pollutants entrained in discharges from construction activity. Erosion can be minimized by a variety of practices. The selection of control measures that will be most effective for a particular site is dictated by site-specific conditions (e.g., topography, soil type, rainfall patterns). 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, as well as overall erosion and sediment control costs. This can be accomplished by reducing the overall area of disturbed land or by phasing construction so that only a portion of the site is disturbed at a time. Another effective approach is to schedule clearing and grading events to reduce the probability that bare soils will be exposed to rainfall.

Managing stormwater flows on the site can be highly effective at reducing erosion. Typical practices include actively managing off-site and on-site stormwater using diversion berms, conveyance channels and slope drains to avoid stormwater contact with disturbed areas. In addition, stormwater should be managed using energy dissipation approaches to prevent high runoff velocities and concentrated flows that are erosive. Vegetative filter strips are often considered as sediment controls, but they can also be quite effective at dissipating energy and reducing the velocity (and thus erosive power) of stormwater.

After land has been disturbed and construction activity has ceased on any portion of the site, exposed soils should be covered and stabilized immediately. Vegetative stabilization using annual grasses is a common practice used to control erosion. Polymers, physical barriers such as geotextiles, straw, rolled erosion control products and mulch are other common methods of controlling erosion. These materials and methods are intended to reduce erosion where soil particles can be initially dislodged on a C&D site, either from rainfall, snow melt or up-slope runoff.

The effectiveness of erosion control measures is dependent on periodic inspection and identification and correction of deficiencies (e.g., after each storm event). Erosion control measures alone will not eliminate the mobilization of soil particles and such controls must be used in conjunction with sediment control measures.

C. Sediment Control Measures

Despite the proper use of erosion control measures, some sediment detachment and movement is inevitable. Sediment control measures are used to control and trap sediment that is entrained in stormwater 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 commonly used approaches for settling out sediment eroded from small and large disturbed areas. Their performance can be enhanced using baffles and skimmers and active treatment processes such as electrocoagulation, filtration, and chemically enhanced settling (e.g., polymer addition).

Active treatment systems are typically used in conjunction with other sediment controls to improve pollutant removals, especially to improve removals of fine-grained and slowly settling or non-settleable particles and turbidity contained in stormwater. Unless sufficient detention time is provided or additives are implemented, particles such as clays and fine silts contained in stormwater discharges from construction sites typically cannot be effectively removed by conventional stormwater BMPs (such as sediment basins and sediment traps) that rely solely on gravity settling. EPA has identified several demonstrated technologies capable of achieving significant reductions of these particles. Based on the information in the record, electrocoagulation, polymer clarification, and chitosan-enhanced filtration treatment technologies are demonstrated as being capable of achieving low levels of turbidity in stormwater discharges.

The active treatment systems EPA has evaluated operate by destabilizing the suspended particles by various mechanisms, aggregating them into larger particles that are easier to remove through settling or filtering. In addition to physical characteristics (e.g., particle surface area, density) that impede timely settling by gravity, these small particles (often clay particles) typically are substantially influenced by net electrical repulsive forces at particle surfaces that prevent the particles from joining together. Coagulation refers to the process whereby these repulsive electrical forces are reduced, allowing particles to come into contact with one another. Flocculation refers to the agglomeration of the destabilized particles by joining and bridging to form larger particles. Following coagulation/flocculation, the densified floc can more easily and effectively be removed via gravitational settling or media filtration (e.g., sand, gravel, bag, or cartridge filters).

Electrocoagulation treatment uses an electrical field to disturb the natural electrical charges of the colloidal particles suspended in stormwater, enabling the particles to coagulate and flocculate, and facilitating gravity settling. This settling may be followed by filtration prior to discharge of the stormwater.

Polymer clarification can operate as a batch process whereby a polymer is added to stormwater contained in a basin. The polymer causes clays and other fine particles to flocculate and gravity settle. Once the turbidity reaches the necessary value and other permit requirements are met, the stormwater is discharged from the basin. Polymer clarification can also be used in flow-through systems. In this application, liquid polymer is injected into the influent to the sediment basin or gel or solid polymer is added by placing polymer-filled socks or ''floc logs'' in channels or pipes carrying sediment-laded runoff into the basin. Stormwater flowing over the socks or logs dissolves the solid polymer, and turbulence at the basin inflow point facilitates mixing and aids in the coagulation/flocculation process.

Chitosan-enhanced filtration is a process that adds a polymer (in this instance, a polymer produced from the chitin in crab shells) to the stormwater to promote flocculation. The flocculated stormwater is then passed through one or more filtration steps and, if permit conditions are met, can be discharged.

These active treatment systems are often equipped with automated instrumentation to monitor stormwater quality, flow rate, and dosage control for both influent and effluent flows.

It has been suggested that, while operating active treatment systems that use polymers to reduce the turbidity of stormwater, construction site dischargers may overuse polymers and, in doing so, introduce toxicity or cause other adverse effects. EPA believes toxic effects from discharges treated to meet a turbidity limit should not be occurring and such events would be indicative of a poorly operated treatment system. Polymers are widely used at a variety of wastewater treatment systems and facilities throughout the country, and EPA is not aware of any studies indicating that polymer addition to treat stormwater from construction sites using ATS has been found to pose a significant risk to water quality at those facilities. There are ample regulatory (i.e., enforcement actions) and financial (e.g., chemical costs) disincentives for dischargers to willfully overuse polymers in their treatment systems. In addition, vendors have indicated that dosages of polymers are carefully metered in ATS systems. Upon closer review of the matter, it appears that this concern has been raised due to anecdotal suggestions, rather than documented evidence of actual discharge events causing toxic effects. To date, EPA has not identified any documented cases where the use of a polymer to treat C&D stormwater discharges caused an adverse effect in the receiving waters. Also, Washington and other States have researched toxicity of some polymers and established a sound basis for testing and significant controls on dosage and usage. For example, Washington State has established protocols for residual chemical and toxicity testing for ATS systems and has required vendors to receive state approval. However, California, in a draft permit fact sheet describing chemical treatment, states the following:

> ''These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). We are concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern. For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation. Due to potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, residual polymer monitoring and toxicity requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.'' (see DCN 41137).

Therefore, EPA recognizes the merits of ensuring that chemical additives are properly used. EPA solicits information and data that quantify the number of instances where overuse of polymers occurred, the circumstances resulting in such overuse, and the actual or potential environmental impacts associated with such events. In addition, EPA solicits comments on the need for approaches (either voluntary or regulatory) to prevent or minimize the potential for such instances and the need for EPA to develop guidance on use of polymers at construction sites.

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

D. Other Construction and Development Site Management Practices

Construction activity generates a variety of wastes and wastewater, including concrete truck rinsate, municipal solid waste (MSW), trash, and other pollutants. Construction materials and chemicals should be handled, stored and disposed of properly to avoid contamination of runoff. Dischargers utilize various practices to manage these wastes and minimize discharges to surface waters, including:

• Protecting construction materials, chemicals and fuels and lubricants from exposure to rainfall;

• Limiting exposure of freshly placed concrete to rainfall;

• Segregating stormwater and other wastewaters from fuels, lubricants, sanitary wastes, and chemicals such as fertilizers, pesticides and herbicides;

• Neat and orderly storage of chemicals, pesticides, fertilizers, and fuels that are being stored on the site;

• Prompt collection and management of trash and sanitary waste;

• Prompt cleanup of spills of liquid or dry materials.

IX. Development of Effluent Limitations Guidelines and Standards

A. Description of the Regulatory Options Considered

In developing today's proposal, EPA evaluated several different options for reducing pollutant discharges from construction activity. The options evaluated by EPA are intended to control the discharge of sediment, turbidity and other pollutants in stormwater and other wastewater from C&D sites. Construction activity typically involves clearing, grading and excavating of land areas. Prior to construction, these land areas may have been agricultural, forested or other undeveloped lands. Construction can also occur as redevelopment of existing rural or urban areas, or infill development on open space within existing developed areas. During the C&D process, vegetation or surface cover is typically removed and underlying soils become more susceptible to detachment by rainfall and erosion by stormwater runoff. Soil is often compacted by construction equipment, reducing the infiltration capacity of underlying soils and increasing stormwater discharge rates. Sediments and other pollutants contained in stormwater can and often are transported off-site and discharged from construction sites. Today's proposal provides regulatory tools to improve erosion and sediment control measures and pollution prevention measures on C&D sites to minimize and control stormwater and other discharges from construction activity.

Certain limitations being proposed today are common to each regulatory option. These common requirements consist of a set of non-numeric effluent limitations that require dischargers to provide and maintain effective erosion control measures, sediment control measures, and other pollution prevention measures to minimize the discharge of pollutants in stormwater and other wastewater from construction sites. These non-numeric effluent limitations included in each regulatory option are described in Section IX.B below.

B. Effluent Limitations Included in All Regulatory Options

EPA's preferred approach is twofold: First, prevent the discharges of sediment and other pollutants from occurring through the use of effective site-specific planning, erosion control measures and pollution prevention measures; and second, control discharges that do occur through the use of effective sediment control measures. Under each regulatory option, dischargers would be required to meet non-numeric effluent limitations requiring them to minimize and control discharges from the site by providing and maintaining effective erosion and sediment control measures and pollution prevention measures.

Dischargers would be required to prevent soil erosion and minimize the discharge of sediment from all areas of the site by providing and maintaining effective erosion control measures. Erosion controls are considered effective when bare soil is uniformly and evenly covered with vegetation or other suitable materials, stormwater is controlled so that rills and gullies are not visible, and channels and streambanks are not eroding. Dischargers would be required to provide and maintain recognized and accepted erosion control measures, including stabilizing disturbed soils immediately after clearing, grading, or excavating activities have permanently or temporarily ceased (i.e., when such activities have been stopped on a portion of the site and will not resume for a period exceeding 14 calendar days). In addition, dischargers would be required to minimize the amount of soil exposed and control stormwater within the site to prevent soil erosion by using effective erosion control measures. Stormwater discharges leaving the site would also need to be controlled to prevent channel and streambank erosion and erosion at outlets.

The following list of principles and practices are generally recognized and accepted as effective erosion controls and would be provided in the rule to help guide the selection, design, and implementation of control measures to meet the effluent limitations on individual construction sites.

• Preserve topsoil and natural vegetation.

• Minimize soil compaction.

• Sequence or phase construction activities to minimize the areas disturbed at any one time.

• Stabilize disturbed areas using temporary or permanent vegetation, and controls such as mulch, geotextiles, or sod.

• Minimize the disturbance of steep slopes, and where such slopes are disturbed implement erosion controls designed to control soil erosion on slopes.

• Establish and maintain natural buffers around surface waters.

• Minimize the construction of stream crossings.

• Divert stormwater that may run onto the site away from any disturbed areas of the site.

Dischargers would also be required to meet non-numeric effluent limits requiring that they provide and maintain effective sediment controls to minimize the discharge of sediment and other pollutants from C&D sites. Sediment control measures implemented at the site would include, at a minimum, the following:

• Establishing perimeter controls for any portion of the down-slope and side-slope perimeter where stormwater will be discharged from disturbed areas of the site.

• Establishing and using stabilized construction entrances and exits that control sediment discharges from the site. Ensuring that vehicles entering and exiting the site use such access points to prevent tracking of sediment onto roads or other areas that convey sediment to surface waters. Removing any sediment or other pollutants, including construction materials, from paved surfaces daily. Washing sediment or other pollutants off paved surfaces into storm drains would be prohibited.

• Establishing and using controls and practices to minimize the introduction of sediment and other pollutants to storm drain inlets that receive stormwater discharges from the site.

• Controlling sediment and other contaminants from dewatering activities. Discharges of dewatering wastes are prohibited unless treated in a sediment basin or similar control measure.

Each regulatory option includes pollution prevention measures that would minimize or prohibit the discharge of pollutants from a variety of sources and activities at C&D sites. Each option would prohibit discharges of construction wastes, trash, sanitary wastes, and wastewater from washout of concrete, paint, and other such materials. The regulatory options would also prohibit the discharge of fuels, oils, and other materials used in vehicle and equipment operation and maintenance. The discharge of wastewater from washing vehicles and equipment where soaps or solvents are used would be prohibited. The discharge of pollutants resulting from the washing of equipment and vehicles using only water would also be prohibited, unless wash waters were treated in a sediment basin or alternative control that provides equivalent or better treatment. Dischargers would be required to implement measures to minimize the exposure of stormwater to building materials, landscape materials, fertilizers, pesticides, herbicides, detergents, and other liquid or dry products. In addition, dischargers would be required to implement appropriate spill prevention and response procedures for these materials.

C. Options for BPT, BCT, BAT and NSPS

EPA considered the following three regulatory options for today's proposal.

• *Option 1*

Each C&D site subject to the rule would be required to implement the limitations described above in Section IX.B. In addition, certain larger sites would be required to install and maintain sediment basins or equivalent sediment controls. Specifically, for portions of sites that drain to one location and will have 10 or more acres disturbed at one time, dischargers would be required to install a sediment basin to control and treat the stormwater discharges. The proposed rule would impose minimum standards of design and performance for sediment basins. The basin would be required to provide storage for a calculated volume of stormwater (called the water storage volume) from a 2-year, 24-hour storm from each disturbed acre drained plus a sediment storage volume of at least an additional 1,000 cubic feet, until final stabilization of the disturbed area. Alternatively, a sediment basin providing a water storage volume of 3,600 cubic feet per acre drained plus the sediment storage volume would be required. To ensure adequate retention time to facilitate settling of sediment particles, the proposed rule would require that the effective length of the basin must be at least four times the width of the basin and that the water storage volume be designed to drain over a period of at least 72 hours using a surface outlet (such as a skimmer), unless otherwise designated by the permitting authority. The size of the basin that would be required is based on the size of the drainage area that will have vegetation removed and soils disturbed (i.e., if the total 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 stormwater is directed around both the disturbed area and the sediment basin, then the storage volume can be sized based on 13 acres).

In addition, the design of the sediment basin would be required to address site-specific factors such as amount, frequency, intensity and duration of stormwater runoff; soil types; and other factors affecting pollutant removal efficacy. For example, particle settling characteristics, and thus pollutant removal efficacy, can be affected by physical parameters of the basin such as inlet and outlet velocities, basin surface area, and basin depth and volume necessary to provide sufficient storage for sediment load and stormwater runoff. Effective erosion and sediment controls are generally recognized as including actions to divert stormwater away from disturbed areas of the site, so that sediment erosion is reduced and sediment controls, such as basins, are not overwhelmed by stormwater volumes.

To minimize carryover and discharge of suspended particles from the sediment basin, the basins would be required to incorporate an outlet device designed to remove water from the top of the water column in order to minimize the amount of sediment and other pollutants entrained in the discharge. This can be accomplished by using technologies such as a siphoning outlet, surface skimmer or floating weir.

Recognizing that there may be impediments to using sediment basins in some instances or that alternative approaches may provide better controls depending on site-specific conditions, the proposed rule would authorize dischargers to use alternative controls equivalent to sediment basins where approved by the permitting authority.

EPA encourages dischargers to use improved sediment basin designs that incorporate features such as baffles and to increase the length to width ratio of the basin to maximize detention time and settling. The use of these practices may significantly improve the performance of sediment basins in certain cases. The North Carolina Department of Transportation (NCDOT) has developed draft specifications for baffles in sediment basins (see DCN 43083). EPA solicits comments on whether porous baffles, as described in the draft NCDOT specifications, should be minimum requirements for all sediment basins nationwide. EPA also requests comments on the costs and effectiveness of baffles used in sediment basins, either alone or in combination with skimmers and polymer addition. EPA also solicits comments on the detention time requirements for sediment basins contained in today's proposal, and whether the proposed rule should include other specific detention time, overflow rate or other design or performance requirements for sediment basins. EPA also solicits comments on whether the regulation should require that sediment basins be designed to remove a specified particle size. EPA also requests comments on whether sediment basin designs should be required to address downstream channel erosion by requiring peak or discharge rates to match predevelopment conditions, and for what storm events such a standard should apply.

Option 1 is estimated to cost approximately $132 million per year (2008 $), not including costs for Alaska, Hawaii and the U.S. territories, and reduce discharges of pollutants by 670 million pounds annually. Monetized benefits of Option 1 are estimated to be $18 million per year. The cost estimates for Option 1 only include costs for larger sediment basins in those states whose sizing requirements are less stringent than those contained in the proposal. These cost estimates do not include any additional costs for implementing skimmers or the additional volume for sediment storage. EPA assumed that these costs would not impact sediment basin costs significantly. Skimmers can be purchased from commercial suppliers, or fabricated on-site. Also not included are costs for deep ripping and decompaction of soils, and several other required BMPs that are not currently part of the CGP or most state permits. EPA solicits comments on the cost assumptions of Option 1. The efficacy of Option 1 (percent of raw stormwater sediment load removed) may be underestimated because only the basins are modeled in the loading analysis. Removals due to other on-site BMPs have not been modeled or included in the analysis.

While developing and evaluating Option 1, EPA considered several possible variations for sediment basin requirements. One approach would have eliminated flexibility for dischargers to use a 3600 cf/acre basin in lieu of the 2-year, 24-hour basin. In effect, all sites required to install a sediment basin under Option 1 would have been required to construct a basin sized to treat runoff from the 2-year, 24-hour storm (or use equivalent control measures). EPA estimated that this variation of Option 1 would cost approximately $1.09 billion per year. EPA also considered an approach that, in addition to specifying a particular size of basin, would require that the sediment basin be sized and constructed to enable settling of a specified-size particle—e.g., 10-micron particles. This approach would be a design standard rather than a numeric limitation on the sediment basin effluent. For example, the California Stormwater Quality Association Construction Handbook (see DCN 43017) contains an example of designing a sediment basin to remove a specified particle size standard based on wet sieve analysis for the 10 micron particle for a 10-year, 6-hour storm event. EPA estimates, using this approach, that sediment basins required to remove particles greater than 10 microns nationwide would cost approximately $1.7 billion per year. More information about these potential sediment basin approaches is presented in the Development Document. EPA solicits comment on whether Option 1 or other variations described here would be appropriate regulatory approaches and, if so, why, based on the statutory requirements of CWA section 304, they should be considered to represent BPT, BCT, BAT, or NSPS level of control for this industry.

- *Option 2*

The requirements that would be established under Option 2 incorporate all of the Option 1 requirements. In addition, a numeric limit on turbidity of stormwater discharges would apply to sites that meet certain criteria for size of the site, average clay content of the soil (with clay content being defined as soil particles less than 2 microns in diameter), and rainfall erosivity factor (''R factor'') as defined by the Revised Universal Soil Loss Equation (see *Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE),* United States Department of Agriculture, Agriculture Handbook Number 703, January 1997). Option 2 would establish a numeric effluent limit on the turbidity of stormwater discharges for any site that meets all three of the following criteria: (1) Average soil clay content of more than 10 percent; (2) annual R factor of 50 or more; and (3) has a size of 30 or more acres. The numeric turbidity standard would apply to discharges produced from rainfall events up to the local 2-year, 24-hour storm. Any volume in excess of the 2-year, 24-hour storm would be exempt from the turbidity standard. The turbidity limitation would apply to these sites in addition to the Option 1 requirements (i.e., such sites would also be required to implement the non-numeric erosion and sediment control measures described under Option 1). Under Option 2, dischargers would be required to monitor stormwater discharges for turbidity, which can be done either by using automated instrumentation or with a portable, hand-held turbidimeter or similar device. Sites with a common drainage location that serves an area with 10 or more acres of land disturbed land at one time that are not required to meet the turbidity requirement, either because the total size of the site is less than 30 acres, the R factor is less than 50 or the average clay content of soils is less than 10 percent, would be required to install sediment basins as described under Option 1. Site size for sites subject to the proposed turbidity limit is based on the total size of the site, not the amount of disturbed acres or some other subset of the site. Any site which is 30 acres or larger regardless of how much of the site will be disturbed would be subject to the turbidity limit if they also meet the R factor and soil clay content thresholds.

By considering the construction site's soil clay content, this option takes into account the pollutant reductions that are achievable using the erosion control measures and traditional sediment control measures (i.e., those other than active treatment systems) included in the proposed rule. These more traditional approaches to controlling stormwater discharges can be very effective in soils with low clay content where the entrained sediment is amenable to gravity settling. However, as the amount of clay in the soil rises, gravity settling processes are less effective and processes to enhance the removal of pollutants from stormwater are necessary. By applying the proposed turbidity limit in Option 2 to sites with 10% or more clay content, the proposed rule would achieve significant reductions of the slowly settling or non-settleable particles and turbidity contained in stormwater. In order to remove these fine-grained particles from stormwater discharges, active treatment technologies, such as those described in Section VIII, typically would need to be employed. The information in the record shows that these systems can achieve low levels of turbidity in the stormwater discharges.

While it is impossible to predict the weather several months in advance of construction, for many areas of the country, there are definite optimal periods for conducting construction activities in order to limit soil erosion, such as a dry season when rain tends to fall less frequently and with less force. When feasible, this is the time to disturb the earth, so that the site is stabilized by the time the seasonal wet weather returns. The R factor is intended to reflect consideration of the amount and intensity of precipitation expected during the time the earth will be exposed.

The method for determining a site's R factor is based on the Universal Soil Loss Equation (USLE) developed by the U.S. Department of Agriculture (USDA) in the 1950s to help farmers conserve topsoil. The USLE has been updated to the Revised USLE (RUSLE). Using a computer model supported by decades worth of rainfall data, USDA established estimates of rainfall erosivity factors (R) for locations throughout the country. These R factors are used as surrogate measures of the impact that rainfall has on erosion from a particular site. The R factor represents the driving force for erosion, taking into consideration total rainfall, intensity and seasonal distribution of the rain. Isoerodent maps depicting the R factor in various parts of the country have been created by USDA and are included in Chapter 2 of Agriculture Handbook Number 703.

While developing and evaluating Option 2, EPA considered several possible variations for the applicability of a limitation on turbidity of stormwater discharges. One approach would replace the R factor criteria with one based on total annual rainfall for the site location. Under this approach, EPA preliminarily considered values of 20 inches and 40 inches of total annual rainfall. EPA considers the R factor approach better than total annual rainfall at addressing stormwater discharges because the R factor captures both rainfall energy (a function of the volume of rainfall and runoff) and intensity (which has direct bearing on the erosive power of a rainfall event). EPA has structured the regulatory option accordingly. However, since R factors have not been calculated for all areas of Alaska and the U.S. territories, a criterion of 20-inches total annual rainfall (30-year average using National Weather Service records) has been retained as a substitute for R factor for construction sites in those locations unless an R factor applicable to the construction site is calculated.

EPA also considered approaches that would apply the turbidity effluent limitation to larger sites (e.g., 50 acres instead of 30 acres) or with higher clay content of the soil (e.g., 20 percent instead of 10 percent clay). More information about these potential approaches is presented in the Development Document. EPA solicits comment on whether Option 2 or other combinations of rainfall, clay content and acreage limitations like those described above would be more appropriate regulatory approaches and, if so, why, based on the statutory requirements of CWA section 304, they should be considered to represent BPT, BCT, BAT, or NSPS level of control for this industry. Another option would be to base Option 2 on disturbed acres, instead of the total site size. EPA solicits comments on this approach.

EPA evaluated the advantages and disadvantages of establishing a limitation on turbidity vs. total suspended solids (TSS) in stormwater discharges from construction sites. EPA selected turbidity for two reasons. First, EPA is specifically targeting fine silt, clay and colloidal particles in stormwater runoff. These particles have small diameters and frequently contain a surface charge that prevents agglomeration. As a result, these particles typically do not settle in sediment basins and are not effectively removed by conventional BMPs such as silt fences, which have a large pore diameter. Consequently, discharges from sites with appreciable clay soils may have low TSS concentrations but may still have high turbidity levels. Second, turbidity can be easily measured in the field while TSS requires collection of a sample and analysis in a laboratory. Since most BMPs and treatment systems are flow-through systems, TSS would not be a practical means of estimating compliance because permittees would not be able to verify whether or not they had met the standard before discharging. With turbidity, permittees can measure turbidity levels in discharges continuously and adjust treatment parameters accordingly or recycle effluent if they are in danger of exceeding the turbidity limit. For these reasons, EPA believes that turbidity is a more appropriate measure of effectiveness and can be implemented more easily than TSS. EPA requests comments on this approach.

Option 2 is estimated to cost $1.9 billion per year (2008 $), not including costs for Alaska, Hawaii and the U.S. territories, and reduce discharges of pollutants by 27 billion pounds annually, with a sensitivity analysis estimate of 6.2 billion pounds annually. Monetized benefits of Option 2 are estimated to be $333 million annually.

• *Option 3*

Under Option 3, all sites with common drainage locations that serve an area with 10 or more acres disturbed at one time would be required to comply with the turbidity effluent limitation (in addition to the non-numeric effluent limitations in Option 1). This option does not establish thresholds for R factor (or total annual rainfall) or soil type (i.e., clay content). Under this option, all other sites (i.e., sites with less than 10 acres disturbed at one time) would be required to implement the requirements described under Option 1 (for sites with common drainage locations that serve an area of less than 10 acres disturbed at one time).

Option 3 is estimated to cost $3.8 billion per year (2008 $), not including costs for Alaska, Hawaii and the U.S. territories, and reduce discharges of pollutants by 50 billion pounds annually, with a sensitivity analysis estimate of 11.1 billion pounds annually. Monetized benefits of Option 3 are $470 million annually. EPA notes that its modeling of acres subject to the options evaluated is based on total site size instead of amount of disturbed area on a site. EPA does not have data that can be used to estimate the percentage of a site that is typically disturbed. For example, if a site is 15 acres, but only 7 acres were to be disturbed, then under Option 3 this site would not be subject to the turbidity standard. However, EPA has estimated costs for Option 3 for all sites that, in total, are more than 10 acres. Therefore, to the extent that EPA has overestimated the quantity of acres that would be subject to Option 3, EPA's estimates of costs, benefits and loadings reductions for turbidity controls under Option 3 would also be overestimated.

With regard to Option 3, depending on the location of the construction site and time of year, it is possible that relatively little rain would be expected during construction (based on historical average rainfall patterns) and perhaps dischargers could opt to not install active treatment systems. However, such an approach would expose permittees to the risk of discharging stormwater that exceeds the turbidity limit. On the other hand, taking an overly precautionary approach could result in sites installing treatment equipment that sees little or no use. EPA seeks comment on this issue.

Also with regard to Option 3, EPA has also considered the availability of treatment systems capable of achieving the turbidity effluent limit, as well as whether there is sufficient vendor capacity to meet the demand that would be presented by extending the turbidity effluent limit to all construction sites disturbing more that 10 acres at a time. Option 3 means that substantial numbers of active treatment systems would need to be manufactured and mobilized, along with sizeable levels of vendor support, in a relatively short period of time as NPDES permits incorporating the ELGs and NSPS are issued.

EPA solicits comments on this issue.

D. Option Selection Rationale for BPT

EPA proposes to select Option 1 as the basis for establishing BPT effluent limitations. The requirements established by Option 1 are well-established for construction activities in all parts of the country and are generally consistent with and in some cases more stringent than the control measures currently in place under EPA's Construction General Permit. Some requirements of Option 1 are more stringent than many state general permits, while other requirements are less stringent than some state general permits. EPA has determined that Option 1 represents a level of control that is technologically available and economically practicable. EPA considered the non-water quality environmental impacts of this option and found them to be minimal and thus acceptable. Selecting Option 1 as BPT for this point source category is consistent with the CWA and regulatory determinations made for other point source categories, in that the Option 1 requirements represent limitations based on the average of the best performance of facilities within the C&D industry. *See Weyerhauser Co.* v. *Costle,* 590 F.2d 1011, 1053–54 (D.C. Cir. 1978). As stated in Section III, EPA assesses cost-reasonableness of BPT effluent limitations by considering the cost of treatment in relation to the effluent reduction benefits achieved. EPA has determined that the pollutant reduction benefits achieved by Option 1 justify the costs. We have typically described this as dollars/pound and compare the results with other rules. The incremental costs of Option 1 are approximately $132 million per year

(2008 $). EPA anticipates that construction sites in approximately 11 states would incur costs to comply with the proposed Option 1 BPT requirements requiring sediment basins generally consistent with the EPA CGP. As noted above, the efficacy of this option may be underestimated.

EPA rejected Options 2 and 3 because EPA views BPT performance as the first level of technology-based control representing the average of the best performance. EPA's record does not indicate that meeting a turbidity limit, even for the subset of facilities identified in Option 2 would represent today's average of the best performance and it would not represent the BPT level of control for this point source category. EPA requests comment on what should be considered BPT for this category.

E. Option Selection Rationale for BAT and NSPS

1. Selection Rationale

EPA proposes to select Option 2 as the basis for BAT and NSPS. This option would require all C&D sites to implement the non-numeric effluent limitations described for Option 1, as well as requiring certain sites to meet a numeric limitation of 13 NTU (nephelometric turbidity units) to control turbidity for stormwater discharges. Turbidity is being regulated in this proposed rule as a nonconventional pollutant and an indicator pollutant for the control of other pollutants associated with sediment and materials on construction sites that can become entrained in stormwater discharges from construction sites, including metals and nutrients. Turbidity, measured as NTU, which in construction site runoff primarily reflects sediment, is a nonconventional pollutant because it is not identified as either a toxic or conventional pollutant under the CWA. See CWA section 301(b)(2)(F); 304(a)(4); 40 CFR 401.16; *Rybachek* v. *EPA,* 904 F.2d 1276, 1291–92 (9th Cir. 1990). Turbidity is ''an expression of the optical property that causes light to be scattered and absorbed rather than transmitted with no change in direction of flux level through the sample * * * caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter and plankton and other microscopic organisms.'' 40 CFR 136.3; 72 FR 11200, 11247 (March 12, 2007). In this rulemaking, EPA is identifying turbidity as a pollutant of concern in construction site discharges. By providing a measure of the sediment entrained in stormwater discharges, turbidity is an indicator of the degree to which sediment and other pollutants associated with sediment and found in stormwater discharges are reduced. Turbidity is also a more effective measure of the presence of fine silts, clays and colloids, which are the particles in stormwater discharges that EPA is specifically targeting in today's proposal.

Metals, nutrients, and other toxic and nonconventional pollutants are naturally present in soils, and can also be contributed by equipment/materials used during construction or by activities that occurred at the site prior to the construction activity. Many of these pollutants are present as particulates and will be removed with other particles. Dissolved forms of pollutants are often absorbed or adsorbed to particulate matter and can also be removed along with the particulates (i.e., sediment). EPA has determined that effluent limitations that reduce turbidity in the stormwater discharge will also achieve reductions of the other pollutants of concern. Demonstrating compliance with a turbidity limit would be relatively easy and inexpensive for construction site dischargers to implement. Hand-held turbidity meters (turbidimeters) can be used to measure turbidity in discharges, or data loggers coupled with in-line turbidity meters can be used to automatically measure and log turbidity measurement reducing labor requirements associated with sampling. In addition, the use of turbidity meters will provide dischargers with immediate, real-time information on the efficacy of their treatment systems and sediment control measures to facilitate timely adjustments of system operation where necessary.

The requirements of Option 2 have been demonstrated to be technologically available. Active treatment systems have been used and are currently being used at several hundred construction sites throughout the country. Construction sites where these active treatment systems have been used are primarily located in California, Oregon and Washington, with some in Florida, Maryland, Vermont and other states. Oregon requires sites to meet a 160 NTU benchmark if the site is discharging to a waterbody listed as not meeting applicable water quality standards under section 303(d) or a waterbody with a total maximum daily load (TMDL) for sediment and turbidity. Washington has turbidity benchmark limits that are set at values relative to the turbidity in the receiving steam. Benchmark requirements (e.g., in the context of the Oregon and Washington permits), as opposed to numeric effluent limits, require the facility to take some action to address the potential water quality issue such as additional monitoring or BMP review and do not result in a permit violation. Vermont requires what it defines as ''moderate risk'' projects to take corrective action if turbidity exceeds 25 NTUs. Also, several other states have turbidity limitations or standards that are either in draft permits (such as California), are set relative to background levels (Georgia), or are set only for specific regions or specific waterbodies within the state (such as the Lake Tahoe Basin of California) or for specific construction projects (such as construction of a new runway at the Sea-Tac airport). To comply with these turbidity-based requirements, dischargers have used the active treatment systems described previously—electrocoagulation, polymer clarification, and chitosan-enhanced sand filtration, as well as other approaches. The information in the record demonstrates the efficacy of these treatment systems, showing that they consistently achieve very low levels of turbidity in stormwater discharges. A summary of existing state requirements are contained in the TDD.

EPA also considered the recommendations of the National Research Council (NRC). EPA commissioned the NRC to evaluate the NPDES stormwater program and make recommendations for improvement of the program. The Water Sciences and Technology Board released the report Urban Stormwater Management in the United States (Committee on Reducing Stormwater Discharge Contributions to Water Pollution, National Research Council, National Academies Press) in October of 2008. The report is the product of a 2-year process undertaken by a 15-member committee of national experts.

While the report did not specifically endorse numeric effluent limits for construction sites, the report did contain several recommendations, including that ''Numeric enforcement criteria can be used to define what constitutes an egregious water quality violation at construction sites and provide a technical criterion to measure the effectiveness of erosion and sediment control practices.'' The study continues to report that ''A maximum turbidity limit would establish definitive criteria as to what constitutes a direct sediment control violation and trigger an assessment for remediation and prevention actions. For example, local erosion and sediment control ordinances could establish a numeric turbidity limit of 75 Nephelometric

Turbidity Units (NTU) as an instantaneous maximum for rainfall events less than an inch (or a 25 NTU monthly average) and would prohibit visible sediment in water discharged from upland construction sites. While the exact turbidity limit would need to be derived on a regional basis to reflect geology, soils, and receiving water sensitivity, research conducted in the Puget Sound of Washington indicates that turbidity limits in the 25 to 75 NTU can be consistently achieved at most highway construction sites using current erosion and sediment control technology that is properly maintained (Horner *et al.,* 1990). If turbidity limits are exceeded, a detailed assessment of site conditions and follow-up remediation actions would be required. If turbidity limits continue to be exceeded, penalties and enforcement actions would be imposed. Enforcement of turbidity limits could be performed either by state, local, or third party erosion and sediment control inspectors, or—under appropriate protocols, training, and documentation—by citizens or watershed groups.''

EPA recognizes that the turbidity limits discussed in the report are more like the action levels specified by Washington and other states, rather than binding numeric effluent limitations being proposed by EPA. However, EPA's analysis of ATS effluent data from more than 6,000 data points indicates that a limit of 13 NTUs is technologically available.

California assembled a blue ribbon panel to evaluate, among other things, the feasibility of establishing numeric effluent limits from construction sites (see DCN 41010). The blue ribbon panel found that ''It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with stormwater discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible.''

EPA's selection of Option 2, which requires a turbidity limit only for larger sites, is therefore consistent with the panel's conclusion. EPA notes that although the panel mentions that a numeric limit is not feasible without chemical addition (e.g., polymers) there are technologies available (such as electrocoagulation) that do not use polymers. Further, data in the literature suggests that a somewhat higher limt (e.g., 50–150 NTU) may be achievable using enhanced sediment basin design practices without relying on ATS. An option based on this approach is discussed in more detail below.

The panel, in determining that numeric effluent limits are technically feasible, did express concerns, including cost-effectiveness for small sites, toxicity of treatment chemicals, and the potential for discharges with low TSS and turbidity into receiving waters with high background levels (such as in some arid and semi-arid areas) contributing to channel erosion. EPA has determined that Option 2 addresses these concerns, because the turbidity standard only applies to larger sites and does not apply in arid and semi-arid areas because of the R-factor applicability criteria. EPA is soliciting comment on the need for regulatory requirements or guidance to address the concerns regarding potential toxicity of treatment chemicals. EPA also solicits comments on whether and how toxicity concerns should factor into EPA's BAT determination.

Based on the analysis conducted for this proposed rule, EPA believes that the requirements of Option 2 are economically achievable. Option 2 is projected to have a total industry compliance cost, once fully implemented in NPDES permits, of $1.9 billion per year (2008 $). Since EPA expects that the effluent guidelines requirements will be implemented over time as states revise their general permits, EPA expects full implementation within five years of the effective date of the final rule, currently required to be promulgated in December 2009, which would be 2014. EPA estimates that, once fully implemented, there will be nearly 82,000 firms that perform work falling within scope of Option 2. Average annual revenue for these in-scope firms is $544.14 billion (2008 $). Option 2 compliance costs are 0.35 percent of in-scope firm revenues. Of these 82,000 fims, 6,396 would incur costs under option 2. These firms have revenues of $409.02 billion (2008$) and costs are 0.46% of revenues for firms incurring costs.

Under Option 2, an estimated 774 firms (0.9 percent of all in-scope firms) are estimated to incur compliance costs exceeding 1 percent of annual revenue, and 76 firms (0.1 percent of in-scope firms) are expected to incur compliance costs exceeding 3 percent of revenue. When using EPA's assumption that under normal business conditions firms can pass most of their compliance costs along to customers (85 percent of costs for residential construction and 71 percent for non-residential), there are 20 firms estimated to incur (net) costs exceeding 1 percent of revenue, and no firms expected to incur (net) costs exceeding 3 percent of revenue.

EPA has attempted to analyze the secondary impacts on home buyers when costs are fully passed through. As part of this analysis, EPA converted compliance costs into the likely dollar increase in housing prices. Making assumptions about likely terms of financing, this was converted to an increase in the monthly mortgage payment, where the percent increase in home price is approximately equal to the percent increase in mortgage payment. This analysis assumes there is no change in the set of households that are new home buyers because of the proposed regulation. EPA then used income distribution data to estimate the change in the number of households in the market for a new home that would qualify to purchase the median and lower quartile priced new home under the higher monthly mortgage payment. This analysis was performed using the median and lower quartile priced new home for each metropolitan statistical area (MSA). For the MSA's, the weighted average median priced for a home is $322,000, and the percent increase would be 0.65%. In this way, EPA has attempted to characterize how the potential increase in mortgage payment may affect housing affordability. EPA estimated that 2,195 of these prospective home purchasers would no longer qualify to purchase a median priced home affected by the rule, and 3,243 would no longer qualify to purchase a new lower quartile priced home affected by the rule. However, this approach only looks at two specific points along the spectrum of housing prices and therefore does not represent the total number of households potentially impacted by the rule. EPA is interested in developing an analysis reflective of the number of households that would likely be adversely affected by the proposed regulation, and solicits comment on appropriate methodology and any data that would be required to conduct such an analysis. Based on our analysis thus far EPA believes that the secondary impacts to new home buyers are affordable.

Under normal business conditions with cost pass-through (85% residential and 71% non-residential) EPA estimates the number of firms expected to incur financial stress as a result of the regulatory requirements to be 147 firms which represents 0.2 percent of in-scope firms and 2.3 percent of firms incurring costs under Option 2. A total of 103 firms are estimated to experience negative business value and be at risk of closure due to regulatory requirements, which represents 0.1 percent of in-scope firms and 1.6 percent of total firms incurring costs. These impact measures are not additive, as they evaluate different aspects of a firm's financial viability, and the same firm may be counted under more than one measure. EPA recognizes that this industry is subject to business cycles and performed an adverse business conditions analysis to assess the impacts during an economic downturn. The adverse business conditions case assumes no cost pass-through as well as other less favorable operating factors for the industry. No-cost pass through is a rigid assumption where all impacts are born by the permitee, and there are no secondary impacts on builders who buy lots or buyers of the finished construction. For the adverse case, the results for Option 2 show the number of firms expected to incur financial stress as a result of the regulatory requirements to be 479 firms, which represents 0.6 percent of in-scope firms and 8.3 percent of firms incurring costs under Option 2. A total of 662 firms are estimated to experience negative business value and be at risk of closure due to regulatory requirements, which represents 0.9 percent of in-scope firms and 11.4 percent of firms incurring costs. Nevertheless, given the measures of financial impact, in terms of percentage of in-scope firms and firms incurring costs, EPA considers the rule to be economically achievable by the construction industry. EPA requests comments on its economic achievability analyses and on its proposed determination that Option 2 is economically achievable.

EPA's analysis shows that Option 2 has acceptable non-water quality environmental impacts. The pollution prevention, sediment and erosion control measures included in the proposed rule, including the collection and treatment of stormwater at some construction sites, will not result in a significant incremental increase in the energy consumption, air emissions, or generation of solid waste at construction sites.

EPA has proposed to reject Option 1 as the basis for BAT and NSPS in part because it would not represent the best available or best demonstrated technology for controlling discharges from this industry. Narrative effluent limitations, such as those contained in Option 1, to prevent and minimize erosion and sediment dischargers have been a feature of NPDES permits for many years. Controls are available and demonstrated that provide a higher degree of pollution reduction than Option 1 and consistently provide low turbidity values, making a numeric turbidity limit feasible. In addition, in considering economic achievability of the option, EPA believes that the measures of affordability EPA has used in the past, facility closure and firm failure, and the firm stress metric used in Regulatory Flexibility Analysis also considered here (percent of revenue lost and whether that measure is above 1 or 3 percent) demonstrate that Option 2 can be reasonably borne by the industry.

EPA has also proposed to reject Option 3 as the basis for BAT and NSPS, due primarily to the total industry cost (estimated at $3.8 billion annually). Option 3, once fully implemented, would cost $1.9 billion more annually than Option 2. EPA closely evaluated whether establishing a turbidity limit on all construction sites disturbing more than 10 acres at a time represents the BAT or NSPS level of control—and believes that it does not. Option 3 would require all construction sites, in every part of the country and at all times of the year, to meet a numeric effluent limitation on turbidity if the construction activity disturbs 10 or more acres of land at a time. Construction sites that have soils containing relatively little clay (e.g., a site in coastal Florida with sandy soils) or with low rainfall-runoff erosivity (such as those in certain parts of Idaho) can likely control the discharge of sediments and other pollutants through effective use of the erosion and sediment control measures included in the non-numeric effluent limitations being proposed today. With relatively little of the difficult-to-settle clay present, and with low rainfall energy, sediment production is expected to be low and EPA expects much of the sediment to be removed from stormwater through the use of effective sediment controls. Therefore, EPA believes that requiring these sites to meet a numeric turbidity limit, including the additional costs for monitoring that a numeric turbidity limit would impose, does not represent BAT for these sites. EPA solicits comments on this approach.

In light of the high total cost of Option 3 and the appropriateness of ELG and NSPS turbidity limits in arid areas and at construction sites where rainfall energy is low and soils contain little clay, EPA believes that Option 3 does not represent the best available or best demonstrated technology for the C&D point source category.

In summary, EPA believes that Option 2 is technologically available, economically achievable, and has acceptable non-water quality environmental impacts. EPA believes that establishing a numeric turbidity limitation on a segment of the point source category represents best available and best available demonstrated technology for the C&D industry, striking an appropriate balance that addresses the factors EPA is required to consider under the CWA and the nature of stormwater discharges from construction sites. In addition, EPA has determined that the non-numeric effluent limitations being proposed under Option 2 represent best available and best available demonstrated technology for all dischargers in the C&D industry.

Although EPA has proposed Option 2 as a basis for BAT and NSPS, EPA is soliciting comment on the appropriateness of the numeric turbidity limit of 13 NTUs and the technology basis (i.e., ATS) for Option 2. EPA has identified information that indicates that a limit in the range of 50–150 NTUs might be met by relying on passive, rather than active, treatment systems. Passive treatment systems consist of a number of techniques that do not rely on pumping of stormwater or mechanical filtration and that are not as complex, do not cost as much and do not utilize as much energy as ATS.

Data in the literature indicate that passive systems may be able to provide a high level of turbidity reduction at a significantly lower cost than active treatment systems. For example, McLaughlin (see DCN 41005) evaluated several modifications to standard sediment trap designs at the North Carolina State University Sediment and Erosion Control Research and Education Facility (SECREF). He evaluated standard trap designs as contained in the North Carolina Erosion and Sediment Control Manual utilizing a stone outlet structure as well as alternative designs utilizing a skimmer outlet and various types of porous baffles. Baffle materials tested included silt fence, jute/coconut and tree protection fence tripled over. Tests were conducted using simulated storm events in which sediment was added to stormwater at flows of 10 to 30 liters per second. McLaughlin found that a standard gravel outlet did not significantly reduce turbidity values. Average turbidity values in the basin were 843 NTUs, while average turbidity in the effluent was 758 NTUs using the standard outlet. Use of a skimmer instead of a standard gravel outlet reduced turbidity to an average of 353

NTUs. Additional tests were conducted to evaluate the addition of polyacrylamide (PAM) through the use of floc logs. Floc logs are a solid form of PAM which are designed to be placed in flowing water. They are typically anchored by a rope or by placing them in a mesh bag or cage either in open channels or in pipes. As the water flows over the floc logs, the PAM dissolves somewhat proportional to flow. The floc logs typically have substantial amounts of non-PAM components, which are intended to improve PAM release, maintain the physical integrity of the blocks and enhance PAM performance (McLaughlin—Soil Facts; Chemical Treatments to Control Turbidity on Construction Sites). McLaughlin found that addition of PAM to sediment traps resulted in average effluent turbidities of 152 NTUs using a rock outlet and 162 NTUs using a skimmer outlet. For one set of tests, use of a standard stone outlet along with PAM was able to attain an average effluent turbidity of 51 NTUs, while tests with jute/coconut mesh baffles with PAM were only slightly higher, at 71 NTUs.

Warner (see DCN 43071) evaluated several innovative erosion and sediment controls at a full-scale demonstration site in Georgia as part of the Erosion and Sedimentation Control Technical Study Committee (known as ''Dirt II''). The Dirt II project consisted, among other things, of field monitoring as well as modeling of erosion and sediment control effectiveness at construction sites. The demonstration site was a 50-acre lot in a suburban area near Atlanta where a school was being constructed. In total, 22.5 acres of the site was disturbed. A comprehensive system of erosion and sediment controls were designed and implemented to mimic pre-developed peak flow and runoff volumes with respect to both quantity and duration. The system included perimeter controls that were designed to discharge through multiple outlets to a riparian buffer, elongated sediment controls (called seep berms) designed to contain runoff volume from 3 to 4 inch storms and slowly discharge to down-gradient areas, multi-chambered sediment basins designed with a siphon outlet that discharged to a sand filter, and various other controls. Extensive monitoring was conducted at the site. For one particularly intense storm event of 1.04 inches (0.7 inches of which occurred during one 27 minute period), the peak sediment concentration monitored prior to the basin was 160,000 mg/L while the peak concentration discharged from the sand filter after the basin was 168 mg/L. Effluent turbidity values ranged from approximately 30 to 80 NTUs. Using computer modeling, it was shown that discharge from the sand filter, which flowed to a riparian buffer, was completely infiltrated for this event. Thus, no sediment was discharged to waters of the state from the sand filter for this event. For another storm event, a 25-year rainfall event of 3.7 inches occurred over a 2 day period. Effluent from one sand filter during this storm was 175 mg/L while discharge from a second sand filter was 100 mg/L, except for the first-flush data point occurring at the beginning of the storm event.

There are other references in the literature describing the various types of passive treatment systems and the efficacy of passive treatment systems. One potential application of a passive system would be to add liquid polymer, such as PAM, to the influent of a conventional sediment basin. This can be accomplished by using a small metering pump to introduce a pre-established dose of polymer in the influent pipe or channel. If the polymer is added in a channel far enough above the basin, then turbulent mixing in the channel can aid in the flocculation process. Otherwise, some sort of provision may need to be made to provide mixing in the basin to produce flocs. Polymers typically used in this particular application include PAM, chitosan, polyaluminum chloride (PAC), aluminum sulfate (alum) and gypsum. With any polymer, jar tests should be performed beforehand with soils present on the site in order to determine an appropriate polymer type and dosage.

The Auckland (New Zealand) Regional Council conducted several trials to evaluate the effectiveness of chemical flocculants and coagulants in improving settling of suspended sediment contained in sediment laden runoff from earthworks sites (Auckland Regional Council. The Use of Flocculants and Coagulants to Aid the Settlement of Suspended Sediment in Earthworks Runoff—Trials, Methodology and Design. Technical Publication 227. June, 2004). Trials were conducted using both liquid and solid forms of flocculants. Trials were initially conducted on two projects: a highway project and residential development.

The highway project (ALPURT) evaluated both a liquid polymer system and solid polymers. Liquid polymers evaluated were alum and PAC and solid polymers evaluated were all polyacrylamide products (Percol AN1, Percol AN2 and Percol CN1). Bench tests indicated that AN2 performed best among the solid polymers and that both PAC and alum were effective in flocculating the soils present on the site.

Following bench testing of the polymers, liquid and solid dosing systems were developed. For the liquid dosing system, initial consideration was given to a runoff proportional dosing system which would include a weir or flume for flow measurement, an ultrasonic sensor and signal generating unit, and a battery driven dosing pump. These components, together with costs for necessary site preparatory work, chemical storage tanks and a secure housing, were estimated to cost approximately $12,000 (1999 NZ $) per installation. An alternative system was developed that provided a chemical dose proportional to rainfall. This rainfall driven system, which did not require either a runoff flow measurement system or a dosing pump, had a total cost of $2,400 (1999 NZ $) per installation.

The rainfall driven system operated by collecting rainfall in a rainfall catchment tray. Rainfall into this tray was used to displace the liquid treatment chemical from a storage tank into the stormwater diversion channel prior to entering the sediment basin. The size of the catchment tray was determined based on the size of the catchment draining to the basin, taking into consideration the desired chemical dosage rate obtained from the bench tests. Accumulated rainfall from the catchment tray fills a displacement tank that floats in the chemical storage tank. As the displacement tank fills with rainfall and sinks, liquid chemical is displaced from the chemical storage tank and flows via gravity to the dosing point.

Field trials of the liquid treatment system using alum were conducted at the ALPURT site. The authors report that the system performed ''satisfactorily in terms of reduction of suspended solids under a range of rainfall conditions varying from light rain to a very high intensity, short duration storm, where 24mm of rainfall fell over a period of 25 minutes.'' Suspended solids removal for the intense storm conditions was 92% with alum treatment. For a similar storm on the same catchment with the same retention pond without alum treatment, suspended solids removal was about 10%.

Field trials at the ALPURT site were also conducted using PAC. In total, 21 systems were used with contributing catchments ranging between 0.5 and 15 hectares (approximately 1 to 37 acres). The overall treatment efficiency of the PAC treated basins in terms of suspended sediment reduction were reported to be between 90% and 99% for ponds with good physical designs. The authors noted that some systems did not perform as well due to mechanical problems with the system or physical problems such as high inflow energy (which likely caused erosion or sediment resuspension) or poor separation of basin inlets and outlets. The suspended solids removal for all ponds incorporating PAC ranged from 77% to 99.9%, while the removal in a pond not incorporating PAC ranged from 4% to 12%. Influent suspended solids concentrations for the systems incorporating PAC ranged from 128 to 28,845 mg/L while effluent concentrations ranged from 3 to 966 mg/L. In comparison, influent suspended solids concentrations for the untreated ponds were approximately 1,500 mg/L while effluent concentrations were approximately 1,400 mg/L. The authors also noted that dissolved aluminum concentrations in the outflow from the basins treated with PAC, in most cases, were actually less than the inflow concentrations, and were also less than the outflow concentrations from the untreated ponds. Outflow aluminum concentrations in the PAC treated ponds ranged from 0.01 to 0.072 mg/L. The ALPURT trials generally indicate that a relatively simple, passive treatment system using liquid polymers can result in significant reductions in suspended sediment concentrations, even with influent concentrations in excess of 25,000 mg/L. Although some effluent concentrations were as high as several hundred mg/L, the majority were below 100 mg/L. This indicates that a passive liquid polymer system, perhaps coupled with a gravity sand filter or distributed discharge to a vegetated buffer (as described by Warner, 2001) could be used to meet a numeric effluent limit for turbidity at a significantly lower cost than ATS. EPA solicits comments on this issue.

Field trials of polymer treatment using solid forms of PAM by the Auckland Regional Council were conducted at the ALPURT site as well as a residential project (Greenhithe). Trials at the ALPURT site were conducted by placing the floc blocks in plastic mesh bags in plywood flumes through which the runoff from the site was directed. Initial trials encountered problems due to the high bedload of granular material, which accumulated against and stuck to the floc logs inhibiting solubility of the polymer. The system was reconfigured to incorporate a forebay before the flumes in order to facilitate removal of the bedload fraction. The authors noted that while this system was generally effective at low flow rates, it was difficult to control dosage rates and sediment accumulation in the flumes continued to be a problem. The authors concluded that ''Floc Block treatment has a high potential for removal of suspended solids from stormwater with consistent quality, particularly for small catchments; when flow balancing can be achieved prior to treatment.''

Field trials were also conducted at the Greenhithe site, which was a 4 hectare (approximately 10 acre) residential project. As with the ALPURT trial, a flume was constructed and placed in the flow path immediately before the sediment basin. Results of the trials were mixed. The authors noted several problems with the floc logs, such as drying and breakdown of the logs due to prolonged exposure to the air and softening and breakdown during periods of prolonged submergence. Sediment accumulation around the logs and breakdown continued to be a problem. Incorporating an effective sediment forebay and limiting bedload are suggestions for increasing performance. In addition, the authors recommended soaking the floc logs in water to allow hydration before use and periodic spraying with water as ways to limit drying of the floc logs. EPA notes that similar problems with floc logs have been noted by some construction site field inspectors (see DCN 41109) and by McLaughlin (see DCN 43082). EPA solicits comments on the effectiveness of floc logs as components of passive treatment systems. EPA also solicits comments on any operational or maintenance considerations that should accompany use of solid forms of polymers.

Results of the PAC studies at the ALPURT sites have led the Auckland regional council to require chemical treatment for any site that produces more than 1.5 metric tons of (net) sediment as determined by the Universal Soil Loss Equation. Sites that exceed this threshold will require chemical treatment in accordance with a site chemical treatment plan. Exceptions include projects of less than one month duration and sites with granular volcanic soils and sand areas. Chemical treatment may also not be required if bench testing indicates that chemical treatment will provide no improvement in sediment removal efficiency (see DCN 41111). EPA solicits comments on the approach adopted by the Auckland Regional Council and its applicability to construction and development site discharges in the U.S.

In addition to (or in place of) adding polymers to sediment basins, polymers can be introduced on other areas of the site as a soil stabilization measure or as components of other BMPs. For example, McLaughlin (DCN 41005) evaluated adding polymer to check dams on highway projects. Various other researchers evaluated PAM as a soil stabilization agent. There are a number of documents in the administrative record for this rulemaking describing the use of PAM.

The data from these studies indicate that various types of passive treatment systems that utilize both solid and liquid forms of polymers have been reported to be effective in reducing turbidity levels in discharges from construction and development sites. EPA is therefore soliciting comments on whether a turbidity limitation of 50 to 150 NTUs (or some other value) based on passive treatment systems should instead serve as the basis for BAT limitations and NSPS. EPA solicits comments on the costs, pollutant removal effectiveness and effluent quality attainable by passive treatment systems and on the technical basis for establishing a particular a numeric turbidity limit of 50 to 150 NTUs (or some other value). EPA also solicits comment on the ability to reliably meet a 50 to 150 NTU limit using passive systems on different types of construction and development sites and in locations across the country and on the appropriate monitoring requirements that should accompany passive treatment systems. EPA also solicits comments on the applicability of a 50 to 150 NTU (or some other value) standard. Specifically, since passive systems may be less costly and require less expertise and operator supervision than active treatment systems, EPA solicits comments on whether a standard based on passive systems should apply more broadly and to more sites than are covered by EPA's proposed Option 2, or if EPA should establish a tiered set of turbidity limitations, reflecting variation of site parameters such as site size, rainfall patterns, soil types, soil erodibility, or some other parameter and the specific thresholds that should apply to such parameters. EPA also requests comment on whether it should develop an enhanced non-numeric limitation based on the types of passive technologies discussed above without establishing a specific numeric limit, as well as whether it should consider an ''action level'' based approach such as is required by Washington and several other states through their construction general permits. EPA further requests comment on the feasibility and burden on permitting authorities of an ''action level'' established nationally.

2. Definition of ''New Source'' for the Construction and Development Category

EPA interprets the definition of ''new source'' at CWA section 306(a)(2) as not including discharges associated with construction activity. Section 306(a)(2) of the CWA defines ''new source'' as ''any source, the construction of which is commenced after publication of proposed regulations * * *'' The plain language of section 306 excludes C&D sites because a construction site cannot itself be constructed. Further, the term ''source'' is defined in 306(a)(3) of the CWA to mean ''any building, structure, facility, or installation * * *'' or in-other-words sources that are the product of the construction, not the construction activity itself. Additionally, there is an independent definition of ''construction'' in section 306(a)(5). If construction sites were intended to be ''new sources,'' the Agency finds it illogical that there would be a separate definition for ''construction'' or that there would be a requirement in section 306 of the CWA that ''sources'' be ''constructed'' prior to becoming ''new sources.''

Though EPA interprets the CWA not to apply NSPS under section 306 of the CWA to the C&D point source category, the District Court order enjoins EPA to propose and promulgate NSPS. Therefore, EPA proposes to define ''new source'' for purposes of part 450 as any source of stormwater discharge associated with construction activity that itself will result in an industrial source from which there will be a discharge of pollutants regulated by a new source performance standard in subchapter N other than today's rulemaking. (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 itself constitute a ''new source'' when the facility being constructed would be a ''new source'' regulated by new source performance standards under section 306 of the CWA. For example, construction activity that builds a new pharmaceutical plant covered by 40 CFR 439.15 would be subject to new source performance standards under 40 CFR 450.24.

F. Option Selection Rationale for BCT

EPA is proposing to establish BCT requirements equivalent to BPT. As discussed in IX.C above, the requirements of the proposed BPT have been demonstrated to be technologically available and EPA's analyses show that the requirements are economically achievable.

Establishing BCT effluent limitations for a point source category begins by identifying technology options that provide additional conventional pollutant control beyond that provided by application of BPT effluent limitations. Conventional pollutants under the CWA are biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform, pH, and oil and grease. CWA section 304(a); 40 CFR 401.16. Stormwater discharges, if not adequately controlled, can contain very high levels of TSS. In addition, many of the construction materials used at the site can contribute BOD or oil and grease. Fecal coliform can also be present at elevated levels, due to natural sources (contributed by animal wastes) or if stormwater is not segregated from sanitary waste facilities. See Section VII for additional discussion of pollutant sources.

EPA evaluates the candidate BCT options by applying the two-part BCT cost test. The first part of the BCT cost test is the POTW test. To ''pass'' the POTW test, the cost per pound of conventional pollutant discharges removed in upgrading from BPT to the candidate BCT must be less than the cost per pound of conventional pollutant removed in upgrading POTWs from secondary treatment to advanced secondary treatment. Using the RS Means Historical Cost Indices, the inflation-adjusted POTW benchmark (originally calculated to be $0.25 in 1976 dollars) is $0.92 (2008 $). To examine whether an option passes this first test, EPA calculates incremental values of the candidate option relative to the proposed BPT (Option 1). EPA calculated the incremental cost per pound of conventional pollutants removed ($/lb TSS) for Option 2 to be $0.068. Since this result is less than the POTW benchmark, Option 2 passes the first part of the two-part BCT cost test. EPA also calculated the incremental cost per pound of conventional pollutants removed for Option 3, which is $0.074. Therefore, Option 3 also passes the first part of the BCT cost test.

To pass the second part of the BCT cost test, the industry cost effectiveness test, EPA computes a ratio of two incremental costs. The numerator is the cost per pound of conventional pollutants removed by the BCT candidate technology relative to BPT. The denominator is the cost per pound of conventional pollutants removed by BPT relative to no treatment (i.e., raw wasteload). As in the POTW test, the ratio of the numerator divided by the denominator is compared to an industry cost benchmark. The industry cost benchmark is the ratio of two incremental costs: The cost per pound to upgrade a POTW from secondary treatment to advanced secondary treatment, divided by the cost per pound to initially achieve secondary treatment from raw wasteload. If the calculated ratio is lower than the industry cost benchmark of 1.29 (i.e., the normalized cost increase must be less than 29 percent), then the candidate technology passes the industry cost test. The calculated ratio for Option 2 is 4.46; therefore, it fails the second part of the BCT cost test. The calculated ratio for Option 3 is 4.81; therefore, it also fails the second part of the BCT cost test. Therefore, EPA is proposing to set BCT equal to Option 1.

EPA estimated loading reductions, which are used as the basis of the BCT cost test (as well as the removals, water quality impacts and monetized benefits analysis), by using a model site approach and modeling soil erosion using the Revised Universal Soil Loss Equation (RUSLE). An alternative approach would be to estimate removals on a concentration basis by comparing average effluent TSS concentrations in construction site discharges under baseline conditions to concentrations following EPA's candidate BCT technology options. EPA could then estimate total stormwater treatment volumes and, based on the change in concentrations following treatment, determine the total load of conventional pollutants removed.

EPA did not use a concentration based approach because a nationally representative database of discharge data from construction sites does not exist and EPA believes that the data from several states identified in the literature is inadequate to use as a basis for national estimates. Instead, EPA used RUSLE to estimate soil erosion rates from construction sites. EPA chose to use RUSLE because it is a nationally-recognized model that is based on extensive field data. RUSLE, and its predecessors and variants (such as the Universal Soil Loss Equation (USLE) and the Modified Universal Soil Loss Equation (MUSLE)), have been widely used to estimate erosion rates from agricultural areas. The Office of Surface Mining has developed guidelines (see DCN 41113) for using RUSLE on mine lands, construction sites and reclaimed areas and RUSLE has been widely used to estimate soil erosion rates from these areas. RUSLE estimates soil erosion rates based on a number of input parameters. These input parameters are the rainfall-runoff erosivity factor (R), the soil erodibility factor (K), slope length factor (L), slope steepness factor (S), cover-management factor (C), and practice support factor (P). In developing estimates of soil erosion rates, EPA used a mix of data sources as well as estimates based on best professional judgment (BPJ). For R, EPA used the RUSLE 2 database (RUSLE 2 ARS Version January 19, 2005, Program Database) to extract values for each of the indicator cities modeled. For K and S, EPA used STATSGO soil survey data for each of the indicator cities modeled. For S, EPA inventoried STATSGO soil survey data for over 20 million acres of land surrounding eleven indicator cities to determine area-weighted average slopes present. EPA used the average slope value to calculate the loadings estimates, pollutant loading reductions and water quality changes and associated benefits contained in today's proposal. EPA also calculated a low slope estimate and a high slope estimate in order to evaluate how variation in slope values would affect the results. So as not to use the lowest slope values reported or the highest slope values reported in the STATSGO data, EPA calculated a low slope value as the average of the range of low slope values reported and the overall average slope calculated for the area. Likewise, EPA calculated a high slope estimate as the average between the range of the highest reported slope values reported and the overall average slope calculated for the area. EPA estimated baseline loads and pollutant load reductions using the high and low slope estimates, but did not determine water quality improvements or benefits using these values. For L, EPA assumed a range of slope lengths based on BPJ. For C and P, EPA used BPJ to select values contained in the SEDCAD documentation (SEDCAD 4, Design Manual and User's Guide, Warner, R.C. *et al.* 2006). For C, EPA used a value of 1.0, which corresponds to bare soil. For P, EPA used a value of 0.9, which represents a ''Roughed and Irregularly Tracked'' soil surface.

EPA recognizes that alternate reasonable assumptions might substantially lower the estimated erosion rates, however, we believe that our assumptions based on BPJ are reasonable. EPA notes that the RUSLE estimates developed in support of the BCT calculations are sensitive to the BPJ assumptions for P, C, and L. EPA assumed bare soil conditions with no soil cover for the duration of the construction project, which was assumed to be 9 months. EPA also assumed that 90% of the construction project would be disturbed. EPA has not identified a data source that indicates typical values on construction sites for any of these parameters.

Changing C from 1 to some other value to reflect cover present on a portion of the site would reduce the erosion estimates for that portion of the site that has been covered. As an example, for subsoil on a 6% gradient with straw mulch at 1 ton per acre, the value of C may be 0.2. This would lower the erosion estimates for that portion of the site that has been covered by a factor of 5. EPA expects that some portion of the site would be bare soil for the duration of the construction period, while other portions of the site would have cover installed. EPA therefore recognizes that its estimates of sediment generation are tied to the BPJ assumptions associated with some of the RUSLE parameters and solicits data on the percentage of sites of different sizes that are likely to be bare soil vs. containing various types of cover, and the amount of time these conditions would be present.

Changes in P would also affect erosion rates. The values selected for P would reflect management practices used on the site such as silt fences, terraces and straw bale barriers. P is best determined using the RUSLE program, since values vary based on location. For example, in Lexington, Kentucky, the P value for contour furrowing with moderate ridge height on a 300 foot hillslope with a 10% gradient and hydrologic soil group B on nearly bare soil is 0.89. This value assumes no silt fences, terraces, straw bale barriers or other perimeter controls. Because P factors are usually associated with agricultural management practices, it is not clear to EPA how to compute a P value that would reflect the use practices common on construction sites. EPA solicits comments on this issue. As an alternate example of how P might change, if 50% cover were to be applied to the above example for Lexington, Kentucky, then the P value would change from 0.89 to 0.58, lowering the estimated soil erosion rates by 35% (not accounting for any effects that changes in cover would have on the other parameters in the model).

Likewise, changes in estimates for slope and slope length would change the erosion rate estimates. EPA notes that the United States Department of Transportation (USDOT) specifies maximum slope lengths for flows to silt fences, which range from 25 feet on a 50% slope to 500 feet on a slope of less than 2% for a 30-inch silt fence (USDOT. 1995. Best management practices for erosion and sediment control. Report No. FHWA–FLP–94–005. Eastern Federal Lands Highway Design, U.S Department of Transportation, Sterling, Virginia), which are generally consistent with the BPJ slope lengths selected by EPA, which range from 150 to 425 feet. Maximum slope lengths can be even longer if super silt fence is used. Maryland Department of the Environment (MDE) specified maximum slope lengths for super silt fences ranging from 250 feet on a 50% or greater slope to 1,500 feet on a slope between 10 and 20%. For slopes less than 10%, there are no limitations on maximum slope lengths when super silt fence is used (see Table 7–14 of the TDD). In contrast, the March 18, 2008 draft California construction general permit would require dischargers for Risk Level 2 and 3 sites to apply linear sediment controls along the toe, face and at the grade breaks of exposed and erodible slopes. Maximum sheet flow lengths would be 20 feet for slopes between 0 and 25%, 15 feet for slopes between 25 to 50% and 10 feet for slopes over 50%. If EPA were to make different assumptions about slope length, or use different data to estimate slopes, this could significantly lower the soil erosion estimates. EPA solicits comments on using the USDOT, MDE, draft California, or other data or recommendations as appropriate bases for estimating slope lengths likely to be present on construction sites. EPA also solicits data indicating slope lengths as a function of slope present on actual construction sites as well as other methods to approximate slope lengths. It has been suggested that using the average slope value from STATSGO for areas surrounding EPA's indicator cities may not reflect the possibility that permittees may choose to select land that has flatter slopes than the average values calculated from the STATSGO data, or that permittees may quickly grade sites to be a flatter slope than the average values calculated from the STATSGO data before exposed soil is exposed to significant rainfall. EPA notes that in these cases, the slope length on these sites may be longer than the values estimated by EPA. Conversely, using the average slope value from STATSGO for areas surrounding EPA's indicator cities may not reflect steeper slopes that may be present on projects such as infill developments within existing urban or suburban areas. These sites may not have been developed earlier because flatter land was available to developers.

However, as development progresses outward from the urban core and land becomes less available, it is plausible to assume that undeveloped areas with steeper slopes may be developed. In these cases, slope lengths may be shorter than those estimated by EPA.

While EPA chose to use the RUSLE model because a nationally representative database of discharge data from construction sites does not exist, EPA did compare available data with its RUSLE model results. EPA identified several sources of discharge data. Table 5–1 of the TDD lists eight studies from six states (Maryland, Pennsylvania, Washington, Georgia, Texas and Ohio) that contain TSS data from construction site discharges. These studies show mean inflow TSS concentrations ranging from 359 to 17,500 mg/L, with a mean TSS concentration from all studies of 3,681 mg/L. Additionally, during the current rulemaking, EPA collected discharge data from two vendors and the Oregon Department of Environmental Quality associated with ATS systems on 17 sites located in the states of Oregon, Washington and California. These data show NTU measurements in the influent to the ATS ranging from 0.3 to 4,816 NTUs, with most measurements in the hundreds of NTUs. Although relationships between TSS and turbidity are highly site-specific, it has been suggested that TSS concentrations are roughly 3 times turbidity measured in NTUs. Using this conversion for the ATS data, influent concentrations ranged from approximately 1 to 14,400 mg/L, with most measurements below 2,000 mg/L. EPA also identified data in two studies discussed earlier in this notice. On a site located in Fulton County, GA, Warner found that influent to a basin for a 1.04 inch storm (with 0.7 inches falling in a 27 minute period) had a peak TSS concentration of 160,000 mg/l. For the Auckland monitoring studies, influent concentrations for ponds not using chemical treatment ranged from 680 to 1,500 mg/L. Influent concentrations to ponds utilizing chemical addition ranged from 128 to 28,845 mg/L.

In comparison, EPA's RUSLE model results for the 11 indicator cities ranged from a low of 5,984 mg/L in Albany, New York (using the low slope estimates) to a high of 283,417 mg/L in Las Vegas, Nevada (using the high slope estimate). For the average slope value, which is the basis for the load reduction, water quality improvement and benefits estimates contained in today's proposal, concentration values ranged from a low of 9,874 mg/L in Albany, New York to a high of 190,872 mg/L in Las Vegas, Nevada, with a median of 78,516 mg/L. These results are presented in the record (see DCN 41138).

Moreover, results from Seattle, WA from one of the eight studies mentioned above (Horner, Guerdy, and Kortenhoff, 1990, DCN 01350) can be compared with EPA's model results for Seattle. In Horner, the mean inflow TSS concentration was 17,500 mg/L. Using the RUSLE model, the modeled concentration was 125,593 mg/l.

EPA also compared its estimates of effluent concentrations from a standard sediment basin (without ATS) to available data. Warner monitored sediment basins in Georgia and noted TSS concentrations in basin effluents ranging from 100 to 20,000 mg/L with effluent turbidity values ranging from 125 to 3,500 NTUs. Data from the Aukland study found conventional sediment basin effluent concentrations of about 1,400 mg/L. Data from Horner, Guerdy and Kortenhoff, 1990, Schueler and Lugbill, 1990, and Jarrett, 1996 give mean effluent concentrations ranging from 63 mg/L to 876 mg/L, with a mean concentration of 365 mg/L (see DCN 41138). In addition, 2005 DMR data from 120 construction sites in King County, WA (Seattle) show a median effluent concentration of 9.2 NTU and a mean concentration of 43.11 NTU (which corresponds to about 30 mg/L to 130 mg/L using the rough conversion factor referenced above). See DCN 41138 for these DMR data. EPA solicits comments on the representativeness of the Seattle data as a basis for estimating sediment basin effluent concentrations, since it is EPA's understanding that this data consists of grab samples collected within 24 hours of a storm event (consistent with the Washington monitoring requirements) rather than flow-weighted or time-weighted composite samples collected during the entire effluent hydrograph. Likewise, EPA solicits comments on the other references cited above, and whether these studies should be considered representative of discharges from all areas of the country.

In comparison, EPA's RUSLE model and sediment basin removal calculation results for the 11 indicator cities ranged from a low effluent concentration of 2,992 mg/L in Albany, New York (using the low slope estimate) to a high of 79,585 mg/L in Denver, CO (using the high slope estimate). For average slope value, which is the basis for the load reduction, water quality improvement and benefits estimates contained in today's proposal, concentration values ranged from a low of 4,937 mg/L in Albany, New York to a high of 61,286 mg/L in Denver Colorado, with a median of 34,357mg/L. These results are presented in the record (see DCN 41138).

EPA is concerned about the significant difference between its RUSLE modeled results and the basin influent and discharge data from vendors, the state of Oregon, DMR data from King County and available studies, and the effect this could have on EPA's estimates of loadings, monetized benefits, and projected water quality impacts. EPA assumes this difference is a reflection of both those parameters in RUSLE for which EPA used its professional judgment (e.g., cover, practices and slope length), and the possibility that the measured valued reported in the literature are not representative of average influent and sediment basin effluent concentrations for the range of storm events likely to occur for the duration of the construction project.

To address this concern, EPA conducted a sensitivity analysis to explore the potential impacts on its loadings analysis by revising several of the RUSLE assumptions. EPA changed its assumptions for the C factor and revised the slope length estimates to be consistent with the USDOT reference. For C, EPA assumed that half of the site was in bare soil conditions (with a C of 1) while the other half of the site had a C of 0.12 for sites with less than 5% slope or 0.06 for sites with greater than 5% slope. For slope lengths, EPA fit a curve to the USDOT data for maximum slope lengths for 30 inch silt fence and determined slope lengths for each model site based on the STATSGO average slope present. Using these assumptions, estimated load reductions for Option 2 were 6.2 billion pounds and estimated load reductions for Option 3 were 11.1 billion pounds. This represents a 77% reduction for Option 2 and a 78% reduction in estimated removals for Option 3, as compared to EPA's primary analysis. EPA solicits comments on this sensitivity analysis.

EPA notes that this sensitivity analysis does not capture the full range of uncertainty in its RUSLE based analysis as compared to available data. For example, looking just at Seattle, WA, one of EPA's 11 indicator cities, for which data are also available in Horner, Guerdy, and Kortenhoff, 1990, the measured influent value of 17,500 mg/L is about a factor of seven lower than EPA's calculated average influent value of 125,593 mg/L, while for the effluent, the measured value is 626 mg/L, which is about a factor of 57 below EPA's calculated effluent value of 36,422 mg/L. During the SBREFA outreach, URS (on behalf of the National Association of Homebuilders) used alternative values for C, P, slopes and slope length and calculated sediment erosion rates that were lower by a factor of about 100 than EPA's estimates. EPA requests comment on all aspects of its RUSLE analysis and the sensitivity analysis.

EPA requests comment on all aspects of its modeling approach, particularly its input values. Additionally, EPA is interested in any other sources of sediment basin influent and effluent concentration data from construction sites. This data should also include information on the location of the site, site characteristics, weather patterns (specifically the volume and intensity of storms) and the timing of sampling with respect to storm events.

X. Methodology for Estimating Costs to the Construction and Development Industry

In developing today's proposed rule, EPA has used numeric models to estimate the costs of compliance with potential regulatory approaches. This approach was used to estimate the incremental costs associated with the regulatory options at the state and national level.

In order to estimate costs to different segments of the industry, EPA developed nine model project types. These nine model project types are: Small, medium and large transportation; small, medium and large residential; and small, medium and large non-residential. Small projects are those less than 10 acres, medium projects are 10 or more but less than 30 acres, and large projects are 30 or more acres. Using the NOI data discussed in Section VI.D, EPA developed a national distribution of construction projects and determined the median project size (in acres) of each of the nine model project types. Using estimates of the annual quantity of acres of new developed land determined from the NLCD data (discussed in Section VI.B.), EPA determined the number of model projects in each of the nine categories in each state (excluding Alaska, Hawaii and U.S. territories). Detailed results of this analysis are discussed in the Development Document.

For estimating baseline conditions, EPA evaluated each state's erosion and sediment control requirements to determine the size of sediment basins currently required in each state. For each of the model projects within each state, EPA calculated the size of the sediment basin that would be required. When a state's sediment basin requirements were based on containing runoff from a specific size of storm (such as runoff from the 2-year, 24-hour storm), EPA used one indicator city in each state and obtained rainfall data from various NOAA sources (see discussion on rainfall data in Section VI.F). EPA used the rainfall data for each indicator city for all model projects within a given state. To determine runoff quantities, EPA calculated a runoff coefficient for each state (see discussion in the Development Document for detailed information on these calculations). While EPA acknowledges that using one indicator city to represent rainfall conditions in an entire state is a somewhat simplified approach, it does capture the range of precipitation that occurs across the country and serves as a reasonable method of estimating the costs of the regulatory options.

For each of the regulatory approaches considered, EPA determined the sediment basin volume (in cubic feet) that would be required for each of the model projects in each state. Using data on sediment basin costs, EPA estimated the increase in costs over baseline requirements for each model project in each state. Using the number of model projects in each state, EPA estimated the total costs due to larger sediment basins in each state.

For determining costs for options that include numeric effluent limits, EPA obtained data from vendors of stormwater treatment systems. The technology EPA used as a basis for estimating costs is chitosan-enhanced sand filtration, one type of active treatment system. Information in the record indicates other active treatment technologies have comparable costs. Using data submitted by the vendors, EPA determined a cost for treating stormwater for each of the model projects that would be expected to be subject to the turbidity limit. These costs include treatment chemical costs, labor costs and equipment rental costs, as well as sediment disposal and monitoring costs. However, EPA did not cost these items separately for each model project type. Rather, EPA concluded from examining these data that the average cost across all projects using chitosan-enhanced sand filtration is $0.02 per gallon treated. This includes all of the costs that would be incurred by the operator to install, operate, maintain and remove the treatment systems. Using NOAA data on average annual rainfall for one indicator city within each state, and using state-specific runoff coefficients, EPA determined, for each state, the volume of stormwater that would require treatment for each of the nine model projects. EPA then estimated the costs for treating stormwater from each model construction site within each state based on the $0.02 per gallon estimate. EPA also included additional costs for installing storage necessary to impound runoff from the 2-year, 24-hour storm event, if this volume was greater than the sediment basin storage volume currently required in each state. Using the number of model construction projects within each state, EPA then determined the total costs for treatment at the state and national level.

Chapter 9 of the Development Document contains a more detailed discussion of the EPA's costing approach.

XI. 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 financial performance, firm closures, employment losses, and market changes. In addition, the report provides information on the impacts of the proposal on sales and prices for residential construction. The results from the small business impact screening analysis support EPA's implementation of 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 as described in Executive Order 12866.

This notice includes related sections such as the cost-effectiveness analysis in Section XII, benefits analysis in Section XV, and benefit-cost analysis in Section XVI. 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 236 and 237), uses information from, and builds upon, the 2002 proposed rule (67 FR 42644; June 24, 2002) and the 2004 withdrawal of the proposed rule (69 FR 22472; April 26, 2004). 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 of today's notice.

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 output of goods and services produced domestically in one year by the U.S. economy. Historically, the construction sector has directly contributed 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 began to slow relative to previous highs in the 1990s. This slower economic growth had a negative impact on construction starts for new commercial and industrial projects. Driven in part by low mortgage interest rates, consumer spending for new homes continued to remain strong through 2005. However, speculative buying and relaxed lending standards helped create a market bubble that burst in 2006. Currently the housing market is in an economic downturn, yet some near term future projections are for renewed growth in housing starts in the third quarter of 2009. (Global Insight, ''U.S. Economic Service, Executive Summary'' October, 2008.) EPA acknowledges that future predictions can be highly uncertain and that other projections may be less optimistic. Nonresidential construction, which was weak during the first five years of the decade, recovered to 2000 levels by 2007. (Global Insight, ''The Nonresidential Picture: Will the Rescuer Need To Be Rescued?'' 2007. Global Insight, ''U.S. Economic Service, Executive Summary'' October, 2008.) However, the construction industry is expected to experience declines for the residential, non-residential, and non-building sectors for the near future. The weakness in the construction industry will likely continue until residential markets work through the current inventory of unsold homes and credit markets and the general economy return to a better condition (Global Insight, ''U.S. Economic Service, Executive Summary'' October, 2008.)

The C&D point source category is comprised of activities that disturb land. The category contains business establishments (the Census Bureau uses the term ''establishment'' to mean a place of business; ''Employer establishment'' means an establishment with employees) that are involved in building construction (NAICS 236) as well as heavy and civil engineering construction (NAICS 237). As a starting point, Table XI–1 shows the number of business establishments in the C&D category in 1992, 1997, and 2002. 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 NAICS classification system changed between the issuance of the 1997 and 2002 Economic Census.

Table XI–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 (Pub. L. 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, D. L. ''Land Development 9th ed.'', Home Builder Press of the National Association of Home Builders, Washington, DC, 2000).

TABLE XI–1—NUMBER OF C&D INDUSTRY ESTABLISHMENTS, 1992, 1997, AND 2002, ECONOMIC CENSUS DATA

NAICS	Description	1992 (No.)	1997 (No.)	2002 (No.)	Change 92–97 (%)	Change 97–02 (%)
236	Construction of Buildings, except all other Heavy Construction [a].	168,407	191,101	211,629	13.50	10.70
237 except 2372	Heavy Construction, except Land Subdivision	37,180	42,554	49,433	14.50	16.20
2372	Land Subdivision	8,848	8,185	8,403	−7.50	2.70
Total		214,435	241,840	269,465	14.10	11.30

[a] In the 2002 NAICS classification framework, All Other Heavy Construction was assigned among NAICS 236, 237, and 238. To maintain relevant comparisons, 2002 All Other Heavy Construction data were reassigned back into NAICS 237 (Heavy Construction).

Figures do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2005).

Building upon Table XI–1, Table XI–2 shows the number of firms that are expected to be covered under the C&D proposed regulation. Construction establishments are relatively permanent places of business where the usual business conducted is construction related. Construction firms are an aggregation of construction establishments owned by a parent company that share an annual payroll. EPA estimates that for approximately 99 percent of construction firms there is only one establishment, and those that do have more than one establishment tend to be in the highest revenue categories.

For Table XI–2, EPA subtracted out firms that are engaged in home remodeling (NAICS 236118) from the total of about 269,000 firms in 2002, as they would not be subject to the proposed regulations. The elimination of remodelers is based on the fact that remodeling and renovation activities generally disturb less than one acre of land, if at all. EPA requests comment on its methodology for removing remodelers from the analysis. Thus, the total number of C&D firms would be 178,835.

EPA used data from the Economic Census and other sources to define an average housing density for the nation as a whole (average number of housing units per acre), then used this figure to identify firms to be excluded from regulation based on their likelihood of disturbing less than one acre on a per project basis. EPA believes that these estimates (of firms unaffected by the proposed options) are conservative, meaning that they potentially overestimate the actual number of firms that will be affected. First, while the regulatory threshold applies to each site, EPA excluded firms only if the estimated number of acres disturbed in a whole year falls below the regulatory threshold. In addition, the analysis was not adjusted for the portion of a site that is potentially left undisturbed, such as open space and buffers. Furthermore, EPA assumes that all of the housing units built by a firm during a year are in a project covered by a single NPDES storm water permit, while in reality the firm could build on several separate sites. However, the Agency does not have information on the amount of houses that are built within subdivisions, rather than on discrete lots, by these firms. EPA requests comment on its methodology for excluding firms that do not disturb more than one acre of land from the analysis.

Based upon these adjustments of the total number of firms, EPA believes there currently are about 81,628 firms that would be covered under the rule. However, the Agency has insufficient data to make any further adjustments to the population of developers and builders covered by the proposal. EPA solicits comment on the Agency's estimate of the number of firms that would be covered under the proposal.

TABLE XI–2—NUMBER OF FIRMS COVERED BY THE CONSTRUCTION AND DEVELOPMENT PROPOSED REGULATIONS

NAICS	Industry sector	Firms	
		Number	Percent of total
2361	Residential Building Construction		
236115	New Single-family Housing Construction (except operative builder)	33,609	41
236116	New Multifamily Housing Construction (except operative builder)	2,620	3
236117	New Housing Operative Builder	17,295	21
2362	Nonresidential Building Construction		
236210	Industrial Building Construction	1,610	2
236220	Commercial and Institutional Building Construction	20,797	26
237	Heavy and Civil Engineering Construction		
237310	Highway, Street, and Bridge Construction	5,696	7
Total		81,628	

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 ELG options presented in this notice. An important aspect of 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 a result of the proposed regulations. In theory, incremental compliance costs would 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 notice. 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. The SBAR Panel was convened as part of the 2002 rulemaking effort and EPA considers the information in the 2001 report to still be relevant to today's C&D proposal. Small Entity Representative (SERs) commenters questioned a number of the assumptions in EPA's economic and loading analysis. After considering these comments, EPA determined that it was appropriate to continue to rely on its existing analysis for this proposed rule. EPA will continue to consider the SER comments along with comments received on the proposed rule and revise its analyses for the final rule as appropriate.

EPA estimated the incremental compliance costs for the regulatory options using an engineering cost model that accounts for cost factors such as treatment costs, labor and operation and maintenance costs. Because some of the erosion and sediment controls considered have design requirements that take into account meteorological and soil conditions, EPA developed compliance costs that take into account regional differences.

EPA estimated both the incremental compliance costs and the economic impacts of each regulatory option at the project, 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 summarize each modeling effort.

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 nine model projects based on consideration of size and construction categories. The construction categories were: Residential; commercial & industrial building; and transportation. These three categories were broken out further into small (one acre or more, but less than ten acres), medium (ten acres or more, but less than thirty acres) and large (thirty acres or more) projects.

Based on a review of NOI data, each model of the nine project types was assigned an average number of acres. Implicit in the model project analysis is the assumption that each project is 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 financial investment, planning, and construction roles 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 sometimes 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.'' This approach measures the direct impact of the rule on permit holders expected to incur compliance costs. EPA acknowledges that a portion of these costs will likely be passed along to small builders. The ability of permitees to pass costs through to other builders will vary based on market conditions. These effects are addressed as part of the sensitivity analysis in Appendix 8–1 of the RFA Chapter in the Economic Analysis. Some of these small builders may also be copermitees who are required to be in compliance with these standards. To the extent that they are copermittees, they are not accounted for in the firms incurring costs. However, all costs have been attributed to firms. Allocating costs over a broader number of firms may or may not increase the estimated impacts, but spreads the same costs over a larger number of firms. EPA requests comment about this economic modeling approach.

Land development and construction typically occurs in a series of stages or phases. The model projects developed by EPA incorporate assumptions concerning the costs incurred and revenue earned 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 parcel with one or more finished lots ready for construction.

(3) *Construction.* The developer-builder undertakes the actual construction of the buildings. A substantial portion of this work may be subcontracted out to specialty subcontractors (foundation, framing, roofing, plumbing, electrical, painting, etc.). In the case of a housing subdivision, marketing often 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 conducted an analysis of the multiplier that determines how direct compliance costs translate into the change in the cost of the final product, or finished construction project. EPA developed estimates of the project-specific costs and revenue at each stage of project development as part of this baseline scenario. 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, or office space in a new office park). This produces a more accurate estimate of the costs of complying with the proposed regulation than the costs of installing and operating the technology alone. These are not the same assumptions that are used in the firm level analysis to follow, particularly for economic impacts.

EPA analyzed the impact of today's proposed rule by adding in the regulatory costs at the appropriate stage of the project life cycle. An important consideration for assessing who ultimately bears the financial burden of a new regulation is the ability of the regulated entity to pass the incremental costs of the rule on to their customers. If the developer-builder can pass all of their costs through to the buyer, the impact of the rule on developer-builders is negligible and the buyer bears all the impact. Conversely, if they are unable to pass any of the cost to buyers through higher prices, then they must assume the entire cost. For the economic impact analysis EPA uses three pass-through cases: Zero cost pass-through; full cost pass-through; and partial cost pass-through (85% for residential and 71% for non-residential).

Under the first case, the zero (0%) cost pass-through assumption, the incremental regulatory costs are assumed to accrue entirely to the builder-developer, and appear as a reduction in per-project profits. The sale price of the constructed unit and surrounding lot remains the same as the asking price in the baseline. Using the full (100%) cost pass-through assumption, all incremental regulatory costs are passed through to end consumers. Under this approach, the compliance costs are also adjusted to reflect the developer's cost of debt, equity, and overhead. Consumers experience the impact of the proposed regulatory options in the form of a higher price for each new building or housing unit. For the partial cost pass-through case, firms are assumed to pass on part of the compliance outlay to other parties. For the partial cost pass-through case, EPA assumes a cost pass-through rate of 85% for residential sectors and 71% for non-residential and non-building sectors. This is the expected average long-term level of cost pass-through based on observed response of market supply and demand to changes in prices for new construction. For more on the method used for determining the level of cost pass-through see Section 3.5 of the Economic Analysis, Analysis of Social Cost of the Economic Analysis. When a sector is stressed, cost pass-through will tend to be below this long-term average (i.e., more costs being borne by builders). Conversely, when a sector is booming, most costs are likely to be passed through.

Information in the record indicates that builders do pass through much of the regulatory costs to customers. This is supported by the academic literature and industry publications. However, the financial impact analysis also calculates results under the two bounding cases, no cost pass-through for firms and full cost pass-through for customers, to assess the ability of these groups to absorb the impact of the regulation under a worst case scenario. The two bounding cases also provide an approximation of the sensitivity of impact estimates to the partial cost pass-through assumptions used for the primary case. EPA requests comment on the partial cost pass-through assumptions used for the primary case.

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 undeveloped 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. Model firms are broken out by revenue ranges for each of the NAICS sectors aligning with the principal C&D business segments expected to be affected by the regulation (See Table XI–2). These revenue range and sector breakouts are based on data reported by the Statistics of U.S. Business (SUSB) and the Economic Census. Within each business sector and revenue range model firms are further differentiated based on median, lower quartile, and upper quartile measures of baseline financial performance and condition (i.e., capital returns, profit margins, levels of debt and equity to capital, etc.). Firms in the upper quartile have better than normal financial metrics, while the metrics for firms in the lower quartile are worse than normal. Baseline financing costs (cost of debt and equity) was varied over revenue ranges, with firms in higher revenue ranges having access to more favorable terms. However, the financial data was not sufficiently disaggregated to allow financing terms to vary over the three quartiles. These model firms are used in combination with compliance cost estimates to examine the potential for financial stress, firm closures, employment effects, and increased barriers to the entrance of new firms to the industry. EPA did not base its analysis, as it has for many past ELGs, on firm-specific data because it did not have time under the court imposed deadline to survey the industry and gather such data.

The financial statements for the model firms are constructed to capture two business condition cases for the firm-level analysis: General Business Conditions case that reflects the financial performance and condition of C&D industry businesses during normal economic conditions; and Adverse Business Conditions case that is meant to reflect financial performance during weak economic conditions. The two business condition cases are differentiated by the baseline operating financial circumstances of the model firms as well as other important factors in firm financial performance, including cost of debt and equity capital.

Compliance costs for a given regulatory option are assigned to the model firms, by sector and revenue size category, based on an estimate of ''annual in-scope acreage per dollar of revenue'' for the various model firms. The compliance costs for a given regulatory option were converted to a per-acre basis based on project size, type of construction and other compliance cost-related characteristics such as state and/or climatic region, depending on the option being considered. Since affected acreage is the principal driver of compliance costs, the number of projects and in-scope project acreage associated with a given level of firm revenue will be the primary basis on which compliance costs are assigned to the model firms. The basis for estimating number of projects and in-scope project acreage for model firms will vary by sector and principal construction activity. The estimated per-acre compliance costs for the areas subject to the proposed turbidity limits range from $1,135 to $16,535, with a median value of $7,501.

EPA assigns the per acre compliance costs to each model firm based on an estimate of the acreage developed per million dollars of construction value for the model firm. For residential construction, the acreage per million dollars was derived from the Census Bureau's Census of Housing. For nonresidential construction, information on project acreage and estimated project value from Reed Construction Data is used to derive an average number of acres developed per million dollars of value (Reed Construction, March 2008; see DCN 51017). Using each model firm's acreage to revenue relationship, costs are then assigned to firms based on the number of in-scope firms in each revenue range category. EPA requests comment on its approach for assigning compliance costs to model firms.

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) Costs to Revenue Ratio, (2) Pre-Tax Income to Total Assets Ratio, (3) Earnings before Interest and Taxes (EBIT) to Interest Ratio, and (4) change in business value. The first is a simple screening level measure which is important for measuring the impact on small entities. The second and third are financial measures reported by Risk Management Associates (RMA) for median, lower and upper quartiles by sector and business size that were used in constructing the baseline financial statements for the model firms. The change in business value measure is based on application of compliance costs to the model firm financial statements, both as the estimated absolute dollar change in value and the fraction of firms whose net business value becomes negative because of compliance outlays. The impacts of the compliance costs were examined by calculating the values of each ratio with and without the compliance costs.

In previous effluent guidelines rulemakings, EPA has sometimes varied levels of cost pass-through and sometimes assumed no cost pass-through. In practice, the actual level of cost pass-through is difficult to estimate and changes over time. For example, when a particular industry faces severe economic distress, as with the current homebuilding industry, it is less likely that producers will be able to pass through as significant a portion of compliance costs. When an industry is healthy, higher levels of cost pass-through are likely. Also, the larger share of an industry subject to the regulatory requirements in question, the greater the ability of individual firms to pass through compliance costs, as they will have less competition from unregulated producers. For this analysis, EPA used both the partial and no cost pass-through scenarios, to assess potential economic impacts on the industry under the primary analysis and upper bound scenarios. Full cost pass-through would have no impact on the firms.

3. Housing Market Impacts

EPA developed models to assess the potential impacts of the regulations on the national housing market. Buyers of new nonresidential properties will also be impacted as costs are passed through to them. However, they account for a minority of the construction projects considered and EPA assumes that this group of customers is not as vulnerable to changes in prices as are households in the market for new homes. Therefore, impacts to purchasers of new nonresidential construction sites were not highlighted as part of the financial impact assessment and are accounted for on a more general basis as part of the analysis of impacts on the national economy.

To analyze the impacts of compliance costs on housing affordability, EPA estimated the level of income that would be necessary to purchase both the median and lower quartile priced new home without the proposed regulation, and the change in income needed to purchase the median and lower quartile priced new home under each of the regulatory options. The Agency then used income distribution data to estimate the change in the number of households that would qualify to purchase the median and lower quartile priced new home under each of the regulatory options. In this way, EPA attempted to estimate the number of households that may not be able to afford the exact same new home they could under baseline conditions. The housing market analysis was performed at the level of the metropolitan statistical area (MSA) to account for regional differences in housing prices and income. The housing market analysis uses the full cost pass-through assumption, to estimate the worst-case impacts on new single-family home buyers.

When assessing the impact of the rule on housing affordability, EPA acknowledges that even those buyers who are able to afford the median valued single-family home at the new price may still experience an impact. Many households would continue to qualify to purchase (or rent) a housing unit of approximately the same price (or rent) as before the C&D regulation, but would instead experience a reduction in some desirable housing attributes instead. This analysis looks not only at the affordability effect at the median-priced housing unit but also considers the impact on housing affordability at lower housing prices, specifically the impact on households that can afford the lower quartile priced home. Focusing on housing prices below the median provides important insight into the regulation's impact on housing affordability accounting for the likely greater number of households at the income levels that just qualify to purchase/rent lower price units. EPA requests comment on its approach to assessing impacts of the rule on housing affordability.

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 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.

Markets vary in the level of activity, structure of the industry, and ultimately cost pass-through potential, from state-to-state and region-to-region. The modeling approach used for the national impact analysis captures such regional variation in the impacts of the proposed regulatory options by estimating partial equilibrium models at the state level for four major building construction sectors (single-family, multi-family, commercial, and industrial). The analysis of state- and national-level economic impacts is based on estimating changes to economic output, employment, and welfare measures that result from the estimated baseline market equilibrium to the estimated post-compliance market equilibrium for each construction sector in each state.

A partial equilibrium analysis assumes that the proposed regulation will only directly affect a single industry; in this case, the four major construction sectors considered. Holding other industries ''constant'' in this way is generally appropriate since the compliance costs of the proposed regulatory options are expected to result in only marginal changes in prices and quantities and the rule does not directly affect the other industries (HUD, 2006; see DCN 52015).

For the partial equilibrium analysis, EPA uses estimated elasticities of market supply and demand to calculate the impact of incremental costs on the supply curve and, thus, on prices and quantities of construction products under post-compliance conditions.

Economic impacts in the directly affected construction industry can trigger further shifts in output and employment losses in the set of broader U.S. industrial sectors as these changes pass through the economy. 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 some of the anticipated impacts on national output and employment. EPA is also using the Regional Economic Models, Inc. (REMI) Economic Geography Forecasting and Policy Analysis Model to derive a more comprehensive estimate of the potential long-term effects on the national economy. The REMI model uses a similar set of industry sector multipliers, but also incorporates econometric and general equilibrium models to derive a more refined estimate of the impacts on national output and employment.

D. Results

1. Firm-Level Impacts

EPA has estimated the economic impacts of the proposed rule 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 looks at two cases. The first 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). The second case assumes partial cost pass-through, and EPA believes this is more reflective of typical circumstances based on EPA's review of the academic literature and its discussions with industry officials who indicate that under normal business conditions most costs are passed through to the final consumer and are not absorbed by firms in the industry.

EPA analyzed economic impacts at the firm level. The firm 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. Likewise, 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 XI–3 presents one economic indicator, the relationship of compliance cost to firms' annual revenue. A comparison between costs and revenues is typically done prior to any consideration of the pass-through of costs to buyers. Firms whose costs exceed 1% of revenue are only 4.5 percent of the approximately 82 thousand in-scope firms for the most costly option. Furthermore, firms whose costs exceed 3% of revenue are significantly less than 1% for all options considered for proposal.

TABLE XI–3—COST TO REVENUE, ASSUMING NO COST PASS-THROUGH

Option	Costs exceeding 1% revenue			Costs exceeding 3% revenue		
	Number of firms	Percent of firms in-scope	Percent of firms incurring costs	Number of firms	Percent of firms in-scope	Percent of firms incurring costs
Option 1	0	0.0	0.0	0	0.0	0.0
Option 2	774	0.9	12.1	33	0.0	0.5
Option 3	2,475	3.0	18.0	146	0.2	1.1

Source: Economic Analysis.

Table XI–4 presents two additional economic indicators that measure the potential decrease in firms' financial fitness. These indicators are presented using the partial cost pass-through case, which represents the firms' expected ability to pass costs through to buyers. These two indicators were also assessed using the no cost pass-through assumption as one of the revisions made to the adverse analysis case discussed below.

TABLE XI–4—FIRMS EXPECTED TO INCUR FINANCIAL STRESS, ASSUMING PARTIAL COST PASS-THROUGH

	Option 1	Option 2	Option 3
Firms Estimated To Incur Deterioration in Measures of Financial Performance			
Number Incurring Effect	17	147	445
% of All In-scope Firms	0.0	0.18	0.5
% of Firms Incurring Cost	0.5	2.3	3.2
Firms Whose Net Business Value Becomes Negative as a Result of Compliance (Potential Closures)			
Number Incurring Effect	18	103	389
% of All In-scope Firms	0.0	0.13	0.5
% of Firms Incurring Cost	0.6	1.6	2.8
Number of Jobs	1,087	11,359	25,266
% of In-scope Firm Employees	0.5	1.8	2.7

Source: Economic Analysis.

Deterioration of firm financial performance is based on assessing the impact of costs on two financial measures (Pre-Tax Income/Total Assets and Earnings before Interest and Taxes/Interest). EPA estimated the fraction of firms in the various sector and revenue ranges whose financial indicators decline below the lower quartile for these two measures, as reported by Risk Management Associates (RMA). For each sector and revenue category, whichever of the two measures have the greatest decline is used to represent the impact on financial performance. For additional information on EPA's analysis of the change in financial position, see Section 3.3.4, Estimating the Change in Model Firm Financial Performance and Condition, from the Economic Analysis.

The second economic indicator is firm closures and resulting job loss, by regulatory options. These numbers represent the impact on firms with thin profit margins who are most vulnerable to impacts from costs increases, and they do not represent the effects of a reduction in the overall quantity of construction activity as a result of the C&D rule. Both phenomena can result in job losses, but they are two separate measures of job losses and are not necessarily wholly additive or overlapping. Construction is a highly competitive industry that is characterized by many small firms with a relatively high turnover and low barriers to entry. Firms routinely expand and contract their workforce in response to work load and as a result many workers laid off when a firm closes are rehired by new and other existing more financially healthy firms. Therefore, job losses due to firm closures are in many cases a temporary displacement of the workforce. By contrast, job losses due to market contraction result from an overall reduction in the volume of construction and can be considered a more lasting effect until market conditions change again. For more information on job losses due to market contraction, see Section 3.5 Analysis of Social Cost in the Economic Analysis.

The C&D industry has historically been a relatively volatile sector, and is subject to wider swings of economic performance than the economy as a whole. EPA has used historical financial and census data for the C&D industry to discern long-term trends within the market fluctuations. EPA based its primary economic analysis on data that reflects average long-term performance rather than a temporary high or low. The industry is currently experiencing a period of weakness, which will persist until residential markets work through the current inventory of unsold homes, and credit markets and the general economy return to a better condition. There continues to be considerable uncertainty regarding how much the market for new construction will contract or how far real estate values will decline, before the construction industry begins to recover. EPA realizes that the rule will be promulgated during a low period for the industry, and there may be concerns that additional compliance costs, associated with the rule, could have a greater than normal impact on C&D firms and potentially slow the industry recovery. Again using historical census and financial data for the industry EPA identified periods of weakness for various industry sectors and used them to develop a secondary analysis that represents potential impacts of additional compliance costs during a period of adverse economic circumstances. Three key assumptions EPA used to represent adverse conditions for the industry were that there would be a contraction in overall market activity, firms would finance projects under less favorable terms and no costs incurred by the firm as a result of compliance would be passed through to the buyer. Table XI–5 below shows the results of the adverse analysis case. The number of firms experiencing impacts reflects the market contraction, so they are not directly comparable to the primary analysis case, since they represent differing levels of regulated activity. However, a comparison of the percentage of in-scope firms experiencing impacts and firms incurring costs that experience impacts illustrate the relative difference between the two cases. With regard to Option 2, the percentage of firms in-scope incurring financial stress in the adverse case is three and a half times the percentage in the primary economic analysis and the percentage of in-scope firms at risk of closure in the adverse case is seven times the percentage in the primary economic analysis. There are also corresponding increases in short-term employment losses. However, even with the greater impacts seen under the adverse analysis case, the percentage of total firms experiencing financial hardship, under any of the metrics considered, does not exceed one percent of total in-scope firms or 12 percent of firms incurring costs, for the proposed option. Another important consideration for the adverse analysis case is that under the no-cost pass through assumption, there are no secondary impacts on small builders or affordability effects for buyers. For additional information on the adverse impact analysis case, see Chapters Three and Five of the Economic Analysis.

TABLE XI–5—ADVERSE IMPACT ANALYSIS RESULTS

Impact analysis concept	Option 1	Option 2	Option 3
Firms with Costs Exceeding 1 Percent of Revenue:			
Number of Firms	0	698	2,233
% of Firms In-Scope	0.0%	0.9%	3.0%
% of Firms Incurring Cost	0.0%	12.0%	17.9%
Firms with Costs Exceeding 3 Percent of Revenue:			
Number of Firms	0	30	132
% of Firms In-Scope	0.0%	0.0%	0.2%
% of Firms Incurring Cost	0.0%	0.5%	1.1%
Firms Incurring Financial Stress:			
Number of Firms	51	479	1,534
% of Firms In-Scope	0.1%	0.64%	2.0%
% of Firms Incurring Cost	1.75%	8.3%	12.3%
Firms with Negative Business Value (Potential Closures):			
Number of Firms	88	662	2,164
% of Firms In-Scope	0.1%	0.88%	2.9%
% of Firms Incurring Cost	3.03%	11.4%	17.4%

Source: Economic Analysis.

Since EPA expects that the effluent guidelines requirements will be implemented over time as states revise their general permits (EPA expects full implementation within five years of the effective date of the final rule, currently required to be promulgated in December 2009, which would be 2014), EPA has used macroeconomic forecasts of construction activity to assess when the industry is likely to return to its long-term trend (Global Insight, ''Housing and Construction'', 2008) (Global Insight, ''U.S. Economic Service, Executive Summary'' 2008). Based on these forecasts, EPA anticipates that the industry activity will have recovered to the long-term trend during the period when the rule is being implemented.

2. Impacts on Governments

EPA has analyzed the impacts of today's proposed rule on government entities. This analysis includes the cost to governments for compliance at government-owned construction project sites (construction-related). 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. EPA also estimated the additional administrative costs that government entities would incur for reviewing the additional monitoring reports associated with the turbidity monitoring requirements of Options 2 and 3. Table XI–6 shows the costs that government entities are expected to incur at federal, state, and local levels.

TABLE XI–6—TOTAL COSTS BY GOVERNMENT UNIT

[Millions 2008 $]

	Option 1	Option 2	Option 3
Compliance Costs			
Federal	$2.3	$34.0	$66.5
State	4.4	68.1	128.2
Local	25.1	390.7	735.8
Administrative Costs			
Federal	0.0	0.0	0.0
State	0.0	0.1	0.2
Local	0.0	0.6	1.0
Total Costs			
Federal	2.3	34.0	66.5
State	4.4	68.2	128.4
Local	25.1	391.3	736.8
Total	31.8	593.5	931.7

Source: Economic Analysis.

These additional government costs are not expected to have a significant impact on state and local governments as they account for less than a tenth of a percent of state government revenues and less than a tenth of a percent of estimated local government revenues. For additional information on the effect of the rule on government entities see the UMRA analysis in Chapter 9 of the Economic Analysis.

3. Community-Level Impacts

EPA has estimated community-level impacts based upon the incremental costs of the proposed rule 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 median price per house. Table XI–7 shows the change by selected option in the price per house. It is important to note that these costs would not apply to all new houses built in the U.S., but rather only to those houses that are part of construction projects that are subject to the given regulatory option. Approximately 3 percent of total annual home sales are expected to be in projects subject to Option 1, 8 percent to Option 2 and 13 percent to Option 3. When considering only newly-built homes, approximately 21 percent of sales are expected to be in projects subject to Option 1, 52 percent to Option 2 and 90 percent to Option 3. The table also provides estimates of the expected change in monthly payments under each option for the median and lower quartile priced home. The monthly mortgage payments were calculated using the median and lower quartile priced house for each Metropolitan Statistical Area (MSA) in the country. For the MSA's, the weighted average median price for a home is $322,000, the 5th percentile is $110,000, and the 95th percentile is $560,000. For the lower quartile priced home, the weighted average is $201,000, the 5th percentile is $66,000, and the 95th percentile is $404,000. The U.S. Census does not report lot sizes for the upper or lower quartile. However, housing census data indicates that lower-priced homes have a greater likelihood of having a smaller lot size (U.S. Census Characteristics of New Housing, 2006). To account for this factor, EPA performed the affordability analysis for the lower-quartile price home twice, using both the median lot size for all single family homes and the median lot size for attached single family homes.

TABLE XI–7—CHANGE IN MONTHLY MORTGAGE PAYMENT FOR NEW SINGLE-FAMILY HOME

[Full cost pass-through]

	Option 1	Option 2	Option 3
New Single-Family Median Priced Home			
Price Change New Single-Family Home on Median Sized Lot	$330	$2,100	$2,242
Baseline Mortgage Payment ($/month)	$1,971	$1,971	$1,971
New Mortgage Payment ($/month)	$1,972	$1,985	$1,986

TABLE XI–7—CHANGE IN MONTHLY MORTGAGE PAYMENT FOR NEW SINGLE-FAMILY HOME—Continued
[Full cost pass-through]

	Option 1	Option 2	Option 3
% Change	0.05%	0.70%	0.75%
New Single-Family Lower Quartile Priced Home on Median Sized Lot			
Price Change New Single-Family Home on Median Sized Lot	$330	$2,100	$2,242
Baseline Mortgage Payment ($/month)	$1,358	$1,358	$1,358
New Mortgage Payment ($/month)	$1,359	$1,372	$1,373
% Change	0.04%	1.01%	1.09%
New Single-Family Lower Quartile Priced Home on Median Sized Lot for Attached Single-Family Home			
Price Change New Single-Family Home on Median Sized Attached Lot	$118	$738	$803
Baseline Mortgage Payment ($/month)	$1,358	$1,358	$1,358
New Mortgage Payment ($/month)	$1,359	$1,363	$1,364
% Change	0.01%	0.36%	0.39%

Source: Economic Analysis.

The increase in mortgage payments attributable to the proposed options compared to the estimated mortgage payment for the median price of a new house in the U.S., currently about $1,971, is a small percentage of the overall payment. For these costs, the average monthly mortgage payment would increase by $1, $14, and $15 per month for Options 1, 2, and 3, respectively. For the analysis, EPA assumes that buyers finance approximately 80% of the home purchase price using a 30-year conventional fixed rate mortgage with an interest rate of 7.39%.

EPA also estimated how the change in home prices would affect mortgage availability. EPA estimated that 2,195 prospective new home purchasers would no longer qualify to purchase a new median priced home affected by the rule, and 3,243 would no longer qualify to purchase a new lower quartile priced home affected by the rule. Most impacted home buyers, except those at the low end of the income distribution, would still be able to purchase newly built homes, but not as expensive a home as they could afford without the regulation. EPA has attempted to characterize how the potential increase in mortgage payment may affect housing affordability. However, this approach only looks at two specific points along the spectrum of housing prices and therefore does not represent the total number of households that would have to make a different homebuying decision as a result of the rule. EPA is interested in developing an analysis reflective of the number of households that would likely be adversely affected by the proposed regulation, and solicits comment on appropriate methodology and any data that would be required to conduct such an analysis. For more information on the affordability analysis see Section 3.4, Analysis of Regional-Level Housing Affordability Impacts, of the Economic Analysis.

4. Foreign Trade Impacts

As part of its economic analysis, EPA has evaluated the potential for changes in U.S. trade (imports, exports) of C&D related goods and services. A significant component of the U.S. C&D 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. C&D 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.

This 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 Firms

The construction sector is a relatively fluid industry, as documented in the industry profile, with low barriers to entry and considerable entry and exit activity from year to year. As a result, the potential employment losses or capital idling effects of weakness in a specific firm are likely to be offset by changing levels of activity in other existing firms or entry of new firms into the local market. EPA conducted an analysis to assess the impacts on new firms that choose to enter the C&D point source category. This analysis uses a method called ‘‘barrier to entry’’. EPA examined the ratio of compliance costs to current and total assets to determine if new market entrants could find it more difficult to assemble the capital requirements to start a project than would existing firms. The 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 need to meet the same requirement, and therefore would not obtain a competitive advantage over new entrants. For more information on the analysis see Section 3.3.6 Assessing Potential Barriers to Entry of New Businesses to the C&D Industry from the Economic Analysis.

For the proposed regulatory option (Option 2), the increase in financing requirement varies from approximately 2.7 percent to 7.7 percent of baseline assets depending on the firms size and business sectors. This comparison assumes that the new firm's compliance outlay would be financed and recorded on its balance sheet. To the extent that the compliance outlay is financed and recorded not on the firm's baseline sheet but as part of a separate project-based financing for each individual project, this comparison is likely to be overstated, perhaps substantially. EPA does not consider the increase in financing requirements to pose a significant barrier to entry for potential businesses and projects.

6. Social Costs

EPA's analysis of social costs for each option contains four costs components: (1) Firm compliance costs; (2) incremental increase in government administrative costs; and (3) deadweight loss (loss of economic efficiency in the construction market). When summed, these three cost categories comprise the total social costs for each option.

EPA has conducted a social cost analysis for each option. The Economic Analysis provides the complete social cost analysis for the proposed regulation. The firm-level estimate compliance cost, however, does not account for the potential affect of the proposed options on the quantity of construction activity/units performed in the various C&D markets. Compliance costs for each proposed option have the effect of increasing builder/developer costs, which can cause a leftward shift in the market's supply curve. Part of the increased costs may raise the price of new housing, with the balance of increased costs being absorbed by the builder, depending on the relative elasticities of supply and demand. The resulting shift in market equilibrium may also reduce the quantity of construction units produced in a given market.

EPA has estimated a state-by-state linear partial equilibrium market model for each C&D building sector to estimate this potential market effect on the quantity of output. The estimated change in the quantity of output produced in each C&D market segment is then used to not only adjust the firm-level resource cost of compliance, but also to compute the economic value of the reduction in C&D output, and estimate the total loss of consumer and producer surplus, referred to as the deadweight loss. Table XI–8 shows the change in cost due to the quantity effect (i.e. reduction in market activity), the dead weight loss, and their combined effect on total costs.

TABLE XI–8—TOTAL SOCIAL COST OF OPTIONS

[Millions of $2008]

	Option 1	Option 2	Option 3
Total Costs, Unadjusted for Quantity Effect	$132	$1,891	$3,797
Change in Costs Due to Quantity Effect	0.1	7	17
Total Costs, Adjusted for Quantity Effect	132	1,884	3,780
Total Dead Weight Loss	0.0	3.5	8.4
Additional Government Administrative Costs	0.0	0.7	1.2
Total Social Cost of the Regulation	132	1,888	3,789

Source: Economic Analysis.

7. Small Business Impacts

Section XIX.C of today's document provides EPA's Regulatory Flexibility Analysis (RFA) analyzing the effects of the rule on small entities. For purposes of assessing the economic impacts of today's proposed rule on small entities, small entity is defined by the U.S. Small Business Administration (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 XI–9 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 regulatory options.

TABLE XI–9—SMALL BUSINESS ANALYSIS FOR OPTIONS, 1% AND 3% REVENUE TESTS, ASSUMING NO 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
Option 1	0	0.0	0	0.0
Option 2	618	0.8	51	0.1
Option 3	3,049	3.9	185	0.2

Source: Economic Analysis.

Table XI–9 shows that for the preferred option (Option 2), less than a thousand small firms would be likely to incur direct costs exceeding one percent of revenue, which accounts for less than one percent of the approximately 78 thousand small in-scope firms. Therefore, EPA does not consider the preferred option to have the potential to cause a significant economic impact on a substantial number of small entities. EPA acknowledges that additional small builders may experience secondary impacts in the form of higher lot prices as larger developers attempt to pass some of their compliance costs through. The ability of large developers to pass-through costs to builders will vary based on market conditions in the same manner that the pass-through rate to the purchaser of the finished construction can vary. These effects are addressed as part of the sensitivity analysis in Appendix 8–1 of the RFA Chapter in the Economic Analysis. Additionally, as noted above, some of these small builders may also be copermittees who are required to be in compliance with these standards. To the extent they are copermittees, they are not accounted for in the firms incurring costs. However, all costs have been attributed to firms. Allocating costs over a broader number of firms may or may not increase the estimated impacts, but spreads the costs over a larger number of firms.

XII. Cost-Effectiveness Analysis

For many effluent guidelines, EPA performs a cost-effectiveness (C–E) analysis using toxic-weighted pound equivalents. The C–E analysis is useful for describing the relative efficiency of different technologies. The pollutant removals estimated for today's proposed rule are all based on sediment. While EPA expects that today's rule would also result in a significant reduction of other pollutants associated with sediment at construction sites, such as nutrients and metals, and other pollutants found in urban stormwater runoff, such as organics, oil and grease, pesticides and herbicides, the Agency has not quantified these reductions. The Agency does not have a methodology for converting sediment, measured as TSS or turbidity, into toxic-weighted pound equivalents for a C–E analysis. Instead, EPA compared the cost of each regulatory option to the pounds of sediment removed. This unweighted pollutant removal analysis is meaningful because it allows EPA to compare the cost effectiveness of one option against another, and to other sediment reduction efforts. Table XII–1 shows a comparison of the cost-effectiveness of the options for controlling sediment discharges. EPA notes that the total pollutant reductions for Options 2 and 3 are likely upper-bound estimates, because it is very difficult to estimate baseline sediment discharges from this industry given the variation in stormwater discharge rates, sediment concentrations and the range of conditions present on construction sites across the country.

TABLE XII–1—COST-EFFECTIVENESS OF OPTIONS

	Option 1	Option 2	Option 3
Compliance Cost (millions 2008$)	$132.2	$1,891.0	$3,796.5
Sediment Removed (million lbs/yr)	670	26,426	50,413
Cost per Pound Removed ($/lb)	$0.20	$0.07	$0.08

Source: Economic Analysis.

EPA notes that changes in the loading reduction estimates, as discussed earlier, would affect the cost per pound estimates presented in Table XII–1.

XIII. Non-Water Quality Environmental Impacts

Under sections 304(b) and 306(b) of the CWA, EPA is to consider the "non-water quality environmental impacts" (NWQEI) when setting ELGs and NSPS. EPA used various methods to estimate the NWQEI for each of the options considered for today's proposed rule.

A. Air Pollution

EPA estimates that today's proposed rule would have no significant effect on air pollution because none of the approaches considered 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 under the proposed rule. Use of active treatments systems that utilize diesel-powered pumps and generators would produce additional emissions, however, these emissions are expected to be small compared to current emissions for this industry. EPA estimates that fuel combustion used by ATS would increase industry emissions by approximately 0.3% under Option 2 and 0.5% under Option 3. Increased emissions for Option 1 are expected to be less than 0.1%.

B. Solid Waste Generation

Generation of solid waste could be affected under Options 2 or 3 because of the large volumes of sediment contaminated with polymers or other chemicals that would accumulate in sediment basins. Where permittees are using polymers or other chemicals to treat stormwater, then sediment accumulated in sediment basins or filter backwash waters may need to be handled as solid waste, depending on the nature of the chemical used. However, most dischargers using chemical additives are expected to select polymers that would enable the operator to apply solids (i.e., sediment) on-site to avoid the transportation and disposal costs associated with hauling off-site. For example, chitosan is biodegradable and discussions with vendors indicate that accumulated sediments containing chitosan are usually incorporated as fill materials on-site. If ATS systems utilize bag or cartridge particulate filters, then disposal of these filters would produce additional solid waste. EPA expects that these filters can be managed as nonhazardous solid waste. If states decide to regulate sediment containing polymers as solid waste, then generation of solid waste could be substantially affected.

The Administration recently created an initiative to strengthen control of marine debris, which includes any man-made, solid material that enters the nation's waterways either directly or indirectly via land- and ocean-based sources. Materials from construction sites may become marine debris if they are improperly disposed of or maintained (California Coastal Commission, June 2006). However, many actions can be taken at construction sites to prevent materials used on-site from becoming marine debris. For example, permittees can schedule regular collection and disposal of trash before dumpsters become full, or ensure that adequate waste and recycling receptacles are available and properly covered. Today's guideline includes control measures that should address these issues and preventative actions. (Source: Eliminating Land-based Discharges of Marine Debris in California: A Plan of Action From the Plastic Debris Project, California Coastal Commission, June 2006, available on the Internet at: *http://www.plasticdebris.org/CA_Action_Plan_2006.pdf*).

C. Energy Usage

The consumption of energy as a result of today's proposed rule is not expected to be significant 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. Use of active treatment systems that utilize diesel-powered pumps and generators would result in increased fuel consumption. Likewise, the installation of larger sediment basins would require additional run-time for construction equipment. However the additional fuel consumption for these activities is expected to be small compared to current consumption for this industry. EPA estimates that gasoline and diesel fuel consumption due to portable generators and pumps used as part of an ATS would be approximately 22 million gallons per year under Option 2 and approximately 45 million gallons under Option 3. This represents an increase in fuel usage by the industry of 0.3% under Option 2 and 0.5% under Option 3. Increased fuel consumption under Option 1 is expected to be less than 0.1%. In addition, polymers such as polyacrylamide are produced from petroleum, so additional polyacrylamide usage to treat construction site stormwater runoff would result in increased petroleum consumption. However, usage on construction sites is not expected to significantly increase demand for acrylamide (U.S. acrylamide demand in 2001 was estimated to be approximately 253 million pounds, and additional usage on construction sites would be small). Chitosan, another polymer commonly used on construction sites, and the basis for EPA's BAT option, is manufactured from crustacean shells. Therefore, additional petroleum and energy consumption due to chitosan production and usage is expected to be small. If every site subject to the turbidity limit were to use chitosan, then total chitosan acetate usage (assuming a dosage of 2 mg/L) under Option 2 would be approximately 2 million pounds per year, while under Option 3 would be approximately 2.3 million pounds per year. By comparison, the global chitin market is estimated to be approximately 113 million annually pounds by 2012. See section 11 of the TDD for additional discussion.

XIV. Environmental Assessment

A. Introduction

In its Environmental Assessment (see ''Supporting Documentation''), EPA evaluated environmental impacts associated with the discharge of stormwater from construction activities.

As discussed in Section VII, construction stormwater discharges have been documented to increase the loadings of several pollutants to receiving surface waters. The most prominent and widespread pollutants from construction sites are turbidity and TSS, which are primarily caused by sediment. Discharges of metals, nutrients, and polycyclic aromatic hydrocarbons (PAHs) have also been documented. Other possible construction site pollutants include materials that exert biochemical oxygen demand (BOD), pesticides and other toxic organic compounds.

Pollutants other than sediment derive from construction equipment and materials, contaminants naturally present in a site's soils, or contamination by some other source prior to the start of construction activity at a site. Construction activities mobilize sediments and other pollutants by disturbing soil and altering stormwater runoff quantity and patterns. Construction equipment washes and irrigation of revegetation areas, if not properly managed, can mobilize pollutants during dry weather.

Surface water effects from construction site discharges include physical and biological changes. Physical changes include increased turbidity levels, increased total suspended solids concentrations, increased sedimentation rates, increased levels of pollutants other than sediment, and modified stream flow. Biological changes include decreased organism abundance, modified species composition, and decreased species diversity.

Sediment is the predominant pollutant from construction activity and is also one of the most common sources of impairment under Clean Water Act Section 303(d). According to the *National Water Quality Inventory Report to Congress: 2002 Reporting Cycle* (USEPA, 2007), sediment is the top source of impairment for streams and rivers in the United States. Sediment and siltation impairs 100,446 stream and river miles and turbidity or suspended solids impair 695,133 miles. In addition, 1,317,938 acres of lakes and reservoirs have been documented as impaired by sediment or siltation and 376,832 acres are impaired by turbidity or suspended solids. The report states that sediment also has significant impacts on wetlands. Because only a subset of all surface waters were assessed for water quality impairment during the 2002 Reporting Cycle, it is likely that the quantity of surface water impaired by sediment is greater than the numbers above indicate.

Construction site discharges impair or place additional stress on already impaired waterbodies. Twenty-four states have been able to identify construction activity as a cause of impairment for some waterbodies under their jurisdiction. Identifying the causes of a waterbody's impairment is often a challenging task, however, so it is likely that construction activity is a cause of impairment for more waterbodies than states have been able to identify at this time.

Ecological impacts from sediment discharges to surface waters can be acute or chronic and vary in severity depending on the quantity of sediment discharged, the nature of the receiving waterbody and aquatic community, and the length of time over which discharges take place. Sediment can depress aquatic organism growth, reproduction, and survival, leading to declines in organism abundance and changes in community species composition and distribution. Threatened and Endangered (T&E) and other special status species are particularly susceptible to adverse habitat impacts. According to the United States Fish and Wildlife Service, increased sedimentation is one of the main contributors to the demise of some fish, plants, and invertebrates (see Drennen, Daniel J. United States Fish and Wildlife Service. 2003. The urban life of darters (excessive sedimentation endangers darter fishes). Endangered Species Bulletin. Also see ''Endangered Species Program: Species Information'' at *http://www.fws.gov/endangered/wildlife.html*).

There are numerous processes by which sediment affects aquatic communities. Sediment deposition on waterbody beds can bury benthic communities, smothering fish eggs and other immobile benthic organisms and severing connections to organisms in the water column. Sedimentation also modifies certain types of benthic habitats by filling crevices and burying hard substrates, making recolonization by previously existing organisms difficult unless the sediment is removed.

In the water column, increased turbidity levels block light needed for photosynthesis by submerged aquatic vegetation (SAV), resulting in its reduced growth or death. Because SAV is a primary producer depended upon by many other aquatic organisms in ecosystems, its loss or reduction can create an impact cascade throughout an entire community, lowering the community's total health and productivity. Increased turbidity also impairs the ability of visual predators (e.g., many fish species) to forage successfully. Increased TSS concentrations in the water column can also impair fish gill function, reducing the ability of fish to breathe. These and additional processes by which sediment discharges impact aquatic ecosystems are discussed in more detail in the Environmental Assessment.

Increased sediment and turbidity levels in surface waters can also adversely affect direct human uses of water resources such as navigable channels, reservoirs, drinking water supplies, industrial process water, agricultural uses, and recreational uses, as well as property values.

Sediment deposition on riverbeds can fill and impede use of navigable channels. Between 1995 and 2006, the U.S. Army Corps of Engineers (USACE) funded approximately 3,700 dredging projects at a cost of more than $6.3 million (2007 dollars) to remove more than 2.3 billion cubic yards of sediment from U.S. navigable waters (United States Army Corps of Engineers Dredging Database. 2007).

Reservoirs and lakes serve a variety of functions, including drinking water storage, hydropower supply, flood control, and recreation. Sediment deposition on reservoir and lake beds reduces their capacity to serve these functions. An increase in sedimentation rate reduces the useful life of these waterbodies unless measures are taken to reclaim their capacity. In waters serving as a drinking water source, increased turbidity levels and TSS concentrations degrade water quality unless treatment levels are increased to remove the additional sediment.

Sediment can also have negative effects on industrial activities. Suspended sediment increases the rate at which hydraulic equipment, pumps, and other equipment wear out, causing accelerated depreciation of capital equipment. Sediment can clog cooling water systems at power plants and other large industrial facilities.

Irrigation water used for agriculture that contains sediment or other pollutants from construction site discharges can harm crops and reduce agricultural productivity. Suspended sediment can form a crust over a field, reducing water absorption, inhibiting soil aeration, and preventing emergence of seedlings. Sediment can also coat plant leaves, inhibiting plant growth and reducing crop value and marketability. Other pollutants can damage soil quality (Clark, Edwin, Jennifer A. Haverkamp, and William Chapman. 1985. ''Eroding Soils: The Off-Farm Impacts.'' Washington, DC: The Conservation Foundation).

Sediment deposition in river channels, ditches, and culverts reduces their capacity and can increase flood levels and frequency, increasing the level of adjoining property damage from flooding. Sediment can also lower values of property near impacted surface waters by degrading surface water appearance (ibid). Degraded aesthetics can also lower the value of surface waters for recreational activities such as boating, fishing, and swimming.

Sediment is the primary source of the pollutants turbidity and TSS known to be associated with construction activity, but as stated earlier in this section, other pollutants such as nutrients, PAHs, and metals are also discharged from construction sites. Environmental impacts associated with these other pollutants are qualitatively discussed in the Environmental Assessment. The remaining discussion in this section describes EPA's quantitative analysis of the water quality impacts associated with sediment discharges from construction activity. Additional qualitative information on sediment impacts is also provided in the Environmental Assessment. EPA solicits submission of additional information on discharges from construction activity and environmental impacts associated with those discharges.

B. Methodology for Estimating Environmental Impacts and Pollutant Reductions

This section describes the methodology EPA used to quantitatively assess water quality impacts from construction activity sediment discharges and the water quality benefits expected from today's proposed options. Other pollutants from construction activity, such as nutrients, PAHs, and metals, create water quality impacts, but the information available to EPA on discharges other than sediment from construction sites is insufficient for EPA to quantitatively analyze their impacts. These discharges are instead discussed qualitatively in the Environmental Assessment.

1. National Analysis

EPA conducted a national quantitative analysis of water quality impacts associated with construction activity sediment discharges. To conduct this analysis, EPA used a Spatially Referenced Regressions on Watershed Attributes (SPARROW) model. SPARROW is a statistically-based modeling approach developed by the United States Geological Survey that relates measured levels of water quality components to the attributes of contributing watersheds. SPARROW has been used previously to estimate deliveries of nitrogen and phosphorus to surface waters from point, nonpoint, and atmospheric sources at both national and regional scales. The sediment version of SPARROW allows EPA to estimate levels of total suspended solids (TSS) in the larger freshwater surface waters (Reach File 1 level) in the contiguous 48 states (see description of Enhanced Reach File 1.2 (RF1) in Section VI). EPA used this analysis to examine expected water quality impact improvements under various options relative to current levels of water quality impact. To the extent that changes in the loadings estimates, as discussed above in the sensitivity analysis, may be lower, then the lower loadings estimates would lower the SPARROW estimates of water quality changes by a comparable amount. A full description of EPA's analysis is provided in the Environmental Assessment.

SPARROW estimates total sediment loadings to estuaries but is unable to estimate sediment concentrations in estuaries. EPA instead used the Dissolved Concentration Potential (DCP) approach developed by the National Oceanic and Atmospheric Administration (NOAA) to estimate ambient concentrations of conserved contaminants introduced to estuaries that are subject to mixing and dilution. NOAA has provided DCP factors for most major estuaries in the contiguous 48 states. These factors allow estimation of estuarine TSS concentrations without detailed numerical simulation modeling. A full description of this analysis is provided in the Environmental Assessment.

The compliance options vary in the number of RF1 river and stream miles they improve. Option 1 improves water quality in 175,775 RF1 reach miles. Option 2 improves water quality in 522,120 RF1 reach miles. Option 3 improves water quality in 542,408 RF1 reach miles. In addition to improving water quality in rivers and streams, each option also improves water quality in other types of surface waters such as lakes and estuaries.

Construction activity in the United States is unevenly distributed among watersheds. It is highly concentrated in some areas and very sparse in others. For this reason, EPA presents information on water quality improvements associated with the compliance options for two different groups of watersheds. The first group contains the 10 percent of RF1 watersheds in the conterminous United States with the highest number of construction acres during the 1992–2001 time period (''Top 10%'') and includes 115,568 RF1 stream miles. This group represents 75 percent of all construction activity during this time period and therefore reflects conditions associated with the majority of construction site activity. The second group encompasses all RF1 watersheds containing construction activity during the 1992–2001 time period (''All'') and includes 517,982 RF1 stream miles. Median TSS concentration reductions under the compliance options are greater for the ''Top 10%'' group because construction sites exert a greater influence on water quality in these reaches. This is because construction activities comprise a higher percentage of watershed area in these watersheds.

For the group of watersheds representing 75 percent of construction activity during the 1992–2001 time period, Option 1 reduces sediment discharges by approximately 0.5 billion pounds per year. It reduces median TSS concentration from 248.34 mg/L to 248.05 mg/L, or 0.29 mg/L. Option 2 reduces sediment discharges more than 19 billion pounds per year. It reduces median TSS concentration from 248.34 mg/L to 239.16 mg/L, or 9.18 mg/L. Option 3 reduces sediment discharges by more than 37 billion pounds per year. It reduces median TSS concentration from 248.34 mg/L to 231.65 mg/L, or 16.69 mg/L. The corresponding changes in the group of ''All'' RF1 reaches are shown in Table XIV–1 below.

The median concentrations in Table XIV–1 reflect conditions over multi-year time periods and across a large geographic area. Most construction site discharges are driven by precipitation events and are therefore highly episodic. In-stream TSS concentrations deriving from construction site discharges tend to be higher during and shortly after precipitation events and lower during periods in between precipitation events. In addition, the average median concentrations in Table XIV–1 do not describe the high level of variability seen among different locations affected by construction site discharges. For more information on these sources of variability, see the Environmental Assessment.

TABLE XIV–1—RF1 RIVER AND STREAM MEDIAN TSS CONCENTRATION IMPROVEMENTS UNDER THREE COMPLIANCE OPTIONS

	"Top 10%" RF1 watersheds—median TSS concentration (mg/L)	Reduction in median TSS concentration (mg/L)	"All" RF1 watersheds—median TSS concentration (mg/L)	Reduction in median TSS concentration (mg/L)
Baseline	266.86		287.22	
Option 1	266.85	0.01	287.03	0.19
Option 2	257.10	9.76	282.23	4.99
Option 3	250.13	16.73	279.71	7.51

Estimates from EPA's national quantitative analysis of water quality impacts were used for an analysis of the potential economic benefits of each of today's proposed options. See Section XV for additional information on the economic benefits analysis.

2. Case Study Analysis

In addition to a national analysis of water quality, EPA is conducting a case study analysis. SPARROW allows national examination of water quality at the scale of Reach File 1 surface waters, which is a relatively coarse scale. Reach File 1 surface waters do not include many smaller rivers and streams in the national surface water network. In order to quantitatively examine the nature of water quality impacts from construction activity on smaller rivers and streams, EPA is using the Soil and Water Assessment Tool (SWAT) in combination with the Agricultural Policy—Environmental Extender (APEX) model. SWAT is a watershed-scale simulation model and APEX is a site-scale simulation model. SWAT–APEX was developed by the United States Department of Agriculture's Agricultural Research Service (USDA-ARS). Because of higher computational requirements for the SWAT–APEX model relative to the SPARROW model, EPA has chosen to use the SWAT–APEX model for a single watershed in the Dallas metropolitan region that has experienced significant levels of construction. A description of the case study methodology is provided in the Environmental Assessment. The case study has not been completed, so EPA intends to consider the results of the case study and include the case study analysis in the documentation in support of the final rule. EPA requests comments on this modeling approach.

XV. Benefit Analysis

EPA has assessed the potential benefits associated with the proposed rule by identifying various types of benefits that can result from reducing the level of sediment and turbidity being discharged from construction sites. Where possible, EPA has attempted to quantify and monetize benefits attributable to the regulatory options. Section XIV, Environmental Assessment, established the analytical framework for the benefits analysis.

A. Benefits Categories Estimated

Discharges of sediment and other pollutants from construction activity can have a wide range of effects on down stream water resources. As discussed in Section XIV, there are numerous potential impacts to local aquatic environments, and there are also consequences for human welfare. Human activities and uses affected by construction discharge-related environmental changes include recreation, commercial fishing, public and private property ownership, navigation, and water supply and use. Sediments and other pollutants in discharges from C&D sites can also cause environmental changes that affect the non-use values that individuals have for the assurance that environmental resources are in good condition. These existence services, sometimes described as ''ecological benefits,'' are reflected under the Clean Water Act as aquatic life, wildlife, and habitat designated uses.

Stormwater control measures reduce the amount of sediment that reaches waterways from C&D sites. As sediment loads are reduced, TSS and turbidity levels in adjacent waters decline, which in turn increases the production of environmental services that people and industry value. These environmental services valued by industry and the public include: recreation, public and private property ownership, navigation, water supply and use, and existence services. Table XV–1 provides a summary of various water related activities and their associated environmental services potentially impacted by discharges of sediment from C&D sites.

TABLE XV–1—SUMMARY OF BENEFITS FROM REDUCING SEDIMENT RUNOFF FROM CONSTRUCTION SITES

Activity	Environmental service potentially affected by runoff from construction sites	Benefits category
Recreation —Outings —Boating —Swimming —Fishing	Aesthetics, water clarity, water safety, degree of sedimentation, weed growth, fish and shellfish populations.	Non-market direct use.
Commercial Fishing and Shellfishing	Fish and shellfish populations	Markets.
Property Ownership	Aesthetics, safety of property from flooding, property value.	Markets.
Water Conveyance and Supply —Water conveyance —Water storage —Water treatment	Turbidity, degree of sedimentation	Avoided Costs.
Transportation	Degree of sedimentation	Avoided Costs.
Water Use —Industrial —Municipal —Agricultural	Turbidity	Avoided Costs.
Knowledge (No Direct Uses)	Environmental health	Non-market existence value.

However, not all of the changes in these services can be readily quantified as it requires a thorough understanding of the relationship between changes in water pollutant loads and production of environmental services. This problem is exacerbated by the fact that both the pollutant source and load reductions are relatively small, sporadic, numerous, and dispersed over a wide area when compared to more traditional sources of pollutants, such as a wastewater treatment plant. As a result of the difficulty in assessing changes in each environmental service associated with an activity listed in Table XV–1, EPA chose to focus on two main categories of benefits: avoided costs and non-market benefits. The specific categories of avoided costs considered were: Reservoir dredging, navigable waterway dredging, and drinking water treatment and sludge disposal. Non-market benefits considered were improvements in recreational activities and existence value from improvements in the health of aquatic environments.

B. Quantification of Benefits

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. EPA used estimates of changes in sediment deposition and in-stream TSS concentrations from the SPARROW model runs to quantify the reduction in the amount of sediment that would need to be dredged from reservoirs and the reduction in the amount of TSS that must be removed from the source water used for the production of potable water. The SPARROW results provided these changes for each waterbody in the RF1 network (approximately 60,000 stream segments). This allowed EPA to associate these changes with: Data from the U.S. Army Corps of Engineers on navigable waterways that are routinely dredged; EPA data on source water for drinking water treatment plants; and USGS data on the location of reservoirs used for hydroelectric power, flood control, a source for drinking water, and recreation. SPARROW results also allowed for the estimated change in TSS concentrations in the RF1 network which were mapped to a Water Quality Index (WQI). The index is used to map changes in pollutant parameters, such as TSS, to effects on human uses and support for aquatic and terrestrial species habitat. Section 10.1.1 of the Environmental Assessment Document provides detail on the WQI index and its application to the benefits analysis for the C&D regulation. The WQI presents water quality by linking to suitability for various human uses, but does not in itself identify associated changes in human behavior. Behavioral changes and associated welfare effects are implied in the proposed benefit transfer approach for measuring economic values. For more on the benefit transfer approach see Appendix 7–1 Meta-Analysis Results from the Economic Analysis.

The benefits analysis results are shown in Table XV–2. To the extent that changes in the loadings estimates, as discussed above in the sensitivity analysis may lower the loadings estimates then the lower loadings estimates would lower the SPARROW estimates of water quality changes and the associated benefits presented in Table XV–2 by a comparable amount.

TABLE XV–2—ANNUAL BENEFITS (MILLION 2008 $) FOR OPTIONS

	Regulatory options		
	Option 1	Option 2	Option 3
Avoided Costs			
Reservoir Dredging	$0.6	$17.6	$30.6
Navigable Waterway Dredging	1.0	12.9	27.2
Drinking Water Treatment	0.2	7.4	13.1
Total Avoided Costs [a]	1.8	37.9	70.9
Welfare Improvements	16.6	295.0	398.5

TABLE XV–2—ANNUAL BENEFITS (MILLION 2008 $) FOR OPTIONS—Continued

	Regulatory options		
	Option 1	Option 2	Option 3
Total Monetized Benefits	18.4	332.9	469.5

[a] Totals do not add due to rounding.
Source: Economic Analysis; Environmental Assessment.

XVI. Monetized Benefit-Cost Comparison

EPA has conducted a benefit-cost analysis of the C&D effluent guidelines proposed in today's notice. The benefit-cost analysis may be found in the complete set of support documents. Sections XI, XIV, and XV of this notice provide additional details of the benefit-cost analysis.

Table XVI–1 provides the results of the benefit-cost analysis. A discount rate of 3% was used to annualize costs and benefits. To the extent that changes in the loadings estimates, as discussed above in the sensitivity analysis may lower the loadings estimates, then the lower estimates would lower the SPARROW estimates of water quality changes and the associated benefits presented in Table XVI–1 by a comparable amount. Moreover, changes in the RUSLE parameters as described earlier would reduce EPA's estimates of runoff volumes requiring treatment, which would reduce the costs of Options 2 and 3.

TABLE XVI–1—TOTAL ANNUALIZED BENEFITS AND COSTS OF OPTIONS

[Year 2008 $]

Option	Social costs (2008 $ millions per year)	Monetized benefits (2008 $ millions per year)
Option 1	$132	$18
Option 2	1,891	333
Option 3	3,797	470

XVII. Approach to Determining Long-Term Averages, Variability Factors, and Effluent Limitations and Standards

This section describes the statistical methodology used to develop long-term averages, variability factors, and limitations for BAT and NSPS. For simplicity, the following discussion refers only to effluent limitations guidelines; however, the discussion also applies to new source performance standards. EPA also is soliciting comments on a limitation on pH as described in Section XX. Such a limitation would not be developed using the statistical methodology described below. Instead, EPA typically establishes a range of acceptable values from 6 to 9 to protect against extreme acidity or alkalinity.

A. Definitions

The proposed limitations for turbidity, as presented in today's notice, are provided as the maximum daily discharge limitation. Definitions provided in 40 CFR 122.2 state that the ''maximum daily discharge limitation'' is the ''highest allowable 'daily discharge.'' ' ''Daily discharge'' is defined as the '' 'discharge of a pollutant' measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.'' To be consistent with the daily discharge definition, EPA averaged all measurements recorded each day from each treatment system before calculating the proposed limitations. In complying with the final rule, the number of measurements required each day would be determined by the permit authority. EPA would, however, discourage the practice of allowing the number of monitoring samples to vary arbitrarily merely to allow a site to achieve a desired average concentration, i.e., a value below the limitation that day. EPA expects that enforcement authorities would prefer, or even require, monitoring samples at some regular, pre-determined frequency. As explained below, if a site has difficulty complying with the limitation on an ongoing basis, then the site should improve its equipment, operations, and/or maintenance.

B. Data Selection

The proposed limitations are based upon data from sites located in three western states: California, Oregon and Washington. EPA is soliciting data (see Section XX for a detailed request for data), in part, to evaluate whether the limitations are appropriate for other locations. Typically, EPA qualitatively reviews all the data before making its data selection used to calculate the limitations in final rules. EPA generally selects only from facilities that have the model technologies for the option and meet several other criteria. One criterion generally requires that the influents and effluents from the treatment components represent typical wastewater from the industry, with no incompatible wastewater from other sources (e.g., sanitary wastes). A second criterion typically ensures that the pollutants were present in the influent at sufficient concentrations to evaluate treatment effectiveness. A third criterion generally requires that the facility demonstrate good operation of the treatment component (e.g., data sets for episodes with generally high pollutant concentrations are often excluded). A fourth criterion typically requires that the data can not represent periods of treatment upsets or shut-down periods. EPA solicits comment on its data selection and criteria.

EPA relied on data from two vendors and the Oregon Department of Environmental Quality to calculate limits. Sites were located in California, Oregon and Washington and employed chitosan-enhanced sand filtration. Data were from 19 treatment systems located at 17 different sites. For some of these sites, EPA has data on site locations, treatment systems, flowrates, operating conditions, and treatment volumes. For other sites, this information was not available from the vendors. In total, EPA has 6,537 individual data points on turbidity effluent from these systems. The influent concentrations in these data points are generally substantially lower than the concentrations modeled by EPA in its RUSLE analysis as discussed in section IX. F, which is not consistent with the first criterion above. EPA will be examining this discrepancy between this proposed rule and the final rule and its affect on EPA's analysis. In its calculations of the proposed limitations, EPA applied its criteria and excluded data that do not appear to demonstrate typical performance (e.g., extremely large values for a measurement, daily value, and/or site) and typographical errors. EPA retained 6,003 measurements after incorporating data exclusions. For the final rule, EPA intends to reevaluate its exclusions and inclusions of data, and seek additional information about the sites used as a basis for the proposed limitations. EPA also intends to evaluate, and incorporate as appropriate, any additional data provided by commenters and other sources. For example, a memorandum by GeoSyntec Consultants (see DCN 41114) contains additional data on ATS performance that EPA has not considered in evaluating the limitations.

C. Statistical Percentile Basis for Limitations

The daily maximum limitation is an estimate of the 99th percentile of the distribution of the daily measurements. EPA calculates the daily maximum limitation based upon a percentile chosen with the intention, on one hand, to accommodate reasonably anticipated variability within the control of the site and, on the other hand, to reflect a level of performance consistent with the Clean Water Act requirement that these effluent limitations be based on well operated and maintained facilities. The percentile for the daily maximum limitation is estimated using the product of the long-term average and the variability factor. For the proposed rule, EPA estimated the long-term average and variability factor using a statistical model based upon the lognormal distribution. The Development Document describes this model and others that EPA will consider in developing the final regulations.

D. Daily Maximum Limitation

In establishing the daily maximum limitation, EPA's objective is to restrict the discharges on a daily basis at a level that is achievable for a site that targets its treatment at the long-term average. EPA acknowledges that variability around the long-term average results from normal operations. This variability means that at certain times sites may discharge at a level that is greater than the long-term average. This variability also means that sites may at other times discharge at a level that is considerably lower than the long-term average. To allow for these possibly higher daily discharges, EPA has established the daily maximum limitation that is based upon a long-term average and a variability factor.

1. Long-Term Average

In the first of two steps in estimating the different types of limitations, EPA determines an average performance level (the ''long-term average'') that a site with well-designed and operated model technologies (which reflect the appropriate level of control) is capable of achieving. This long-term average is calculated from the data from the sites using the model technologies for the option. EPA expects that all sites subject to the limitations will design and operate their treatment systems to achieve the long-term average performance level on a consistent basis because sites with well-designed and operated model technologies have demonstrated that this can be done. The proposed long-term average of 2.77 NTU is the median value of 19 long-term averages collected from 17 construction sites (two sites each had two treatment systems). The long-term averages ranged from a minimum of 0.43 NTU to a maximum of 21.86 NTU. The median is the midpoint of the 19 values, and thus, nine of the system averages are above the proposed long-term average and nine are below.

A site that discharges consistently at a level near the proposed daily maximum limitation of 13 NTU would not be operating its treatment to achieve the long-term average of 2.77 NTU, which is part of EPA's objective in establishing the daily maximum limitations. Targeting treatment to achieve the limitation may result in frequent values exceeding the limitation due to routine variability in treated effluent. Operators should instead target the long-term average, and if they do so, should be able to consistently discharge below the limit. To ensure that this is possible, EPA has incorporated an allowance for variability into the limitation.

2. Variability Factor

In the second step of developing a limitation, EPA determines an allowance for the variation in pollutant concentrations when processed through well designed and operated treatment systems. This allowance for variance incorporates all components of variability including process and wastewater generation, sample collection, shipping, storage, and analytical variability. This allowance is incorporated into the limitations through the use of the variability factors, which are calculated from the data from the sites using the model technologies. If a site operates its treatment system to meet the relevant long-term average, EPA expects the site to be able to meet the limitations. The variability factor assures that normal fluctuations in a site's treatment are accounted for in the limitation. By accounting for these reasonable excursions above the long-term average, EPA's use of variability factors results in limitations that are generally well above the actual long-term averages. The proposed variability factor of 4.58 is the arithmetic average of 19 variability factors collected from the 17 construction sites also used to calculate the proposed long-term average. The variability factors ranged from a minimum of 1.96 to a maximum of 10.85.

In its evaluation of the proposed daily variability factor, EPA examined TSS limitations promulgated during the last 10 years. Engineering references (*e.g.* , American Society of Civil Engineers (ASCE)/American Water Works Association (AWWA), *Water Treatment Plant Design*, 4th Edition, McGraw-Hill, NYC, NY, 2005) cite conversion factors for turbidity to TSS values. Because of the generally accepted relationship between turbidity and TSS, EPA assumes that the variability also would be similar for turbidity and TSS. Furthermore, although the regulations were based upon different treatment technologies, wastewater professionals generally agree that TSS and turbidity can be adequately controlled by many different types of treatment systems. Furthermore, each regulation used data from well operated and controlled treatment processes in determining the variability of TSS. As shown in the TDD, the values are relatively close in value, ranging from 2.9 to 5.4, with an arithmetic average of 4.1. Because the C&D technology is a relatively simple one, EPA concluded that the relatively large value of 4.58 for the proposed variability factor still ensures a level of control that EPA considers possible for a simple technology.

E. Engineering Review of Limitations

In conjunction with the statistical methods, EPA performs an engineering review to verify that the limitations are reasonable based upon the design and expected operation of the control technologies and the facility conditions. EPA compared the value of the proposed limitation to the data values used to calculate the limitation. Most monitoring results were substantially lower than the proposed turbidity limit. In most instances where the effluent turbidity was higher than the proposed turbidity limit, the data indicated sudden jumps in turbidity levels which suggested that the treatment system was not being operated properly.

For the final rule, EPA will perform a more in-depth examination of the range of performance by the treatment systems used as the basis of the limitation. Data from some treatment systems demonstrate the best available technology. Data from other systems may demonstrate the same technology, but not the best demonstrated design and operating conditions for that technology. For these sites, EPA will evaluate the degree to which the site can upgrade its design, operating, and maintenance conditions to meet the limitations. If such upgrades are not possible, then EPA will modify the limitations to reflect the lowest levels that the technologies can reasonably be expected to achieve. EPA recognizes that, as a result of the proposed limitation, some dischargers may need to improve treatment systems, erosion and sediment controls, and/or treatment system operations in order to consistently meet the effluent limitation. EPA determined that this consequence is consistent with the Clean Water Act statutory framework, which requires that discharge limitations reflect the best available technology.

F. Monthly Average Limitations

Because this industry generally does not have continuous discharges, EPA is proposing only a daily maximum limitation that would apply only on days when the site discharges. While the actual monitoring requirements will be determined by the permitting authority, the Agency has assumed that sites will monitor every day that the discharge occurs. In similar situations when it has assumed daily monitoring for other industries, EPA typically has also promulgated monthly average limitations with the daily maximum limitations. In establishing monthly average limitations, EPA's objective is to provide an additional restriction to help ensure that sites target their average discharges to achieve the long-term average. The monthly average limitation requires continuous dischargers to provide on-going control, on a monthly basis, that complements controls imposed by the daily maximum limitation. However, EPA expects C&D discharges to be intermittent (only during and after precipitation) with substantial variability in rainfall and site characteristics over the life of the project. Under these circumstances, EPA believes that it appropriate to rely on a daily maximum to ensure that systems are being operated properly. EPA solicits comment on whether monthly average limitations or some other approach would be appropriate to further ensure that sites target treatment at the long-term average.

XVIII. Regulatory Implementation

A. Relationship of Effluent Guidelines to NPDES Permits and ELG Compliance Dates

Effluent guidelines act as a primary mechanism to control the discharge of pollutants to waters of the U.S. Once finalized, the proposed C&D regulations would be applied to C&D sites through incorporation in individual NPDES permits or a general permit issued by EPA or authorized states or tribes under section 402 of the Act.

The Agency has developed the limitations for this proposed rule to cover the discharge of pollutants for this point source category. In specific cases, the NPDES permitting authority may elect to establish effluent limitations for pollutants not covered by this regulation. In addition, if state water quality standards or other provisions of state or federal law authorize or require limits on pollutants not covered by this regulation or authorize or require more stringent limits or standards on pollutants to achieve compliance, the permitting authority has authority to apply those effluent limitations or standards in their NPDES permits. EPA does not intend for this rule to preclude states from including controls in their stormwater programs that are found to be effective at controlling discharges of pollutants.

Since EPA expects that the effluent guidelines requirements will be implemented over time as states revise their general permits, EPA expects full implementation within five years of the effective date of the final rule, currently required to be promulgated in December 2009, which would be 2014.

B. 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 proposed rule includes requirements for the design, installation, and maintenance of erosion and sediment controls, EPA considered the need for a bypass-type provision in regard to large storm events. However, EPA did not specifically include such a provision in the text of the proposed regulation because the proposed ELGs only require dischargers to meet a numeric turbidity limit for discharges from storm events smaller than the 2-year, 24-hour storm. Because EPA is not establishing requirements for control of larger storm events, specific bypass provisions were not necessary. Standard upset and bypass provisions are generally included in all NPDES permits, and EPA expects this will be the case for construction stormwater permits issued after this rule becomes effective.

C. 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 ELGs 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 proposed rule. However, the variance for Fundamentally Different Factors (FDFs) may apply in some circumstances.

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.

D. Other Clean Water Act Requirements

Compliance with the provisions of this proposed rule would not exempt a discharger from any other requirements of the CWA. Notable, if construction activity results in the ''discharge of dredged or fill material'' into waters of the U.S. the discharger at the C&D site must obtain a separate permit under section 404 of the CWA.

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

A. Executive Order 12866: Regulatory Planning and Review

Under section 3(f)(1) of Executive Order 12866 (58 FR 51735, October 4, 1993), this action is an ''economically significant regulatory action'' because it is likely to have an annual effect on the economy of $100 million or more. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in Section 8.3, Comparison of Social Cost and Monetized Benefits in Chapter 8 of the Economic Analysis. A copy of the analysis is available in the docket for this action and the analysis is briefly summarized here. Table XIX–1 provides the results of the benefit-cost analysis.

TABLE XIX–1—TOTAL ANNUALIZED BENEFITS AND COSTS OF THE REGULATORY OPTIONS

Option	Social costs (2008 $ millions per year)	Monetized benefits (2008 $ millions per year)
Option 1	$132	$18
Option 2	1,891	333
Option 3	3,797	470

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2336.01.

Today's proposed option, Option 2, would require operators to perform turbidity monitoring that would entail measuring and recording the NTU level of effluent prior to discharge.

EPA estimates that this provision would create a total annual burden of about 224,000 hours for the proposed rule for permittees and about 25,000 hours for permitting authorities. 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.'' Burden is defined at 5 CFR 1320.3(b).

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 in 40 CFR are listed in 40 CFR part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID number [EPA–HQ–OW–2008–0465]. Submit any comments related to the ICR to EPA and OMB. See **ADDRESSES** section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after November 28, 2008, a comment to OMB is best assured of having its full effect if OMB receives it by December 29, 2008. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) 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 economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For the purposes of assessing the impacts of today's rule on small entities, small entity is defined as either a: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; or (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. EPA does not anticipate any impacts on small organizations and impacts on small governments are covered under the UMRA analysis section. The RFA provides that EPA generally define small businesses according to the size standards established by the Small Business Administration (SBA). The SBA established criteria for identifying small businesses is based on either the number of employees or annual revenues (13 CFR 121). These size standards vary by NAICS (North American Industrial Classification System) code. For the C&D industry NAICS categories (236 and 237) the small business annual revenue threshold is set at $33.5 million. The SBA sets the small business threshold for NAICS 2372 (Land Subdivision of NAICS 237) at $7 million. However, for the purpose of the economic analysis, EPA allocated this sector amongst the four primary building construction sectors: Single-family housing, multifamily housing, industrial building, and commercial and institutional building construction.

In order to gather more information on the potential impacts of today's proposal on small businesses, EPA voluntarily followed the provisions of section 609(b) of the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). EPA voluntarily convened a panel for this rulemaking on September 10, 2008. EPA held an outreach meeting with SERs on September 17, 2008. A list of SERs and the outreach materials sent to SERs are included in the docket (see DCN 41115–41133). Because of the voluntary nature under which EPA followed section 609(b), EPA does not plan to complete the panel process or release an Initial Regulatory Flexibility Analysis (IRFA). However, EPA did prepare a report that summarizes information obtained from the panel, which is also included in the docket (see DCN 41136).

After considering the economic impacts of today's proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. Overall, EPA estimates that in a typical year there will be 82,000 in-scope firms, and of this total, approximately 78,000, or about 96 percent, are defined as small businesses. For this option, EPA estimates that about 618 small businesses would experience costs exceeding 1 percent of revenue and 51 small businesses would incur costs exceeding 3 percent of revenue. Both numbers represent very small percentages of the in-scope small firms. The 618 firms estimated to incur costs exceeding 1 percent of revenue represent about 0.4 percent of all small C&D sector firms and 0.8 percent of estimated potentially in-scope small businesses. The 51 firms estimated to incur costs exceeding 3 percent of revenue are again very small percentages at less than one-tenth of a percent of both small business counts. Therefore, EPA does not consider the preferred option to have the potential to cause a significant economic impact on a substantial number of small entities.

In developing the current set of proposed options, EPA considered potential affects on small firms, as demonstrated by the inclusion of a one to less than ten acre project size category for each option. The regulatory requirements for these small size projects are considered to be significantly less burdensome than those for the larger size projects. Although small firms do not directly equate to small projects, EPA's review of the construction industry suggests that smaller firms tend to undertake smaller projects.

Therefore, EPA considers the inclusion of a separate small site size category with less burdensome requirements to be an effective way to address potential impacts on small firms. We continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

D. 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 the 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 to State, local, and tribal governments, in the aggregate, or to 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 the 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 the 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 expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA EPA has already initiated consultations with the governmental entities affected by this rule. EPA took and responded to comments from government entities on the earlier proposed C&D rule. To help characterize the potential impacts to government entities EPA has gathered state government data on NOI submissions, and from U.S. Census data and Reed Construction Data, EPA has compiled information on how much construction activity is undertaken by government entities. EPA has routinely consulted with EPA regional offices who maintain direct and regular contact with state entities. Finally, EPA met directly with and solicited data from all the state Stormwater Coordinators who attended EPA's Annual Stormwater Conference in 2007. As part of the financial impact analysis, EPA looked specifically at the impact on government entities resulting from both compliance with construction site requirements and from administering the additional monitoring reports submitted by in-scope firms. Table XIX–2 shows the results of this analysis. For more information on how this analysis was performed see Section 9–1 Assessing Costs to Government Entities in Chapter 9 of the Economic Analysis.

TABLE XIX–2—IMPACTS OF REGULATORY OPTIONS ON STATE AND LOCAL GOVERNMENTS

[Million 2008 $]

	Option 1	Option 2	Option 3
Compliance Costs			
Federal	$2.3	$34.0	$66.5
State	4.4	68.1	128.2
Local	25.1	390.7	735.8
Administrative Costs			
Federal	0.0	0.0	0.0
State	0.0	0.1	0.2
Local	0.0	0.6	1.0
Total Costs			
Federal	2.3	34.0	66.5
State	4.4	68.2	128.4
Local	25.1	391.3	736.8

Source: Economic Analysis.

In developing this rule, EPA consulted with small governments pursuant to its plan established under section 203 of the UMRA to address impacts of regulatory requirements in the rule that might significantly or uniquely affect small governments. To ensure that the proposed Options were not disproportionately affecting small government entities EPA analyzed impacts on small government entities. The assessment of impacts on small governmental entities involved three steps: (1) Identifying small government entities (i.e., those serving populations of less than 50,000, (5 U.S.C. 601[5])), (2) estimating the share of total government costs for the regulatory options incurred by small governments, and (3) estimating the potential impact from these costs based on comparison of small government outlays with small government revenue and outlays. For details of this analysis see Section 9.2 Assessing Costs and Impacts on Small Government Entities in Chapter 9 of the Economic Analysis. Table XIX–3 has the results of the small government entity impact analysis.

TABLE XIX–3—IMPACTS OF REGULATORY OPTIONS ON SMALL GOVERNMENT UNITS

[Million 2008 $]

	Option 1	Option 2	Option 3
Compliance Costs			
Small Government Entities	$11.8	$183.6	$345.8
Administrative Costs			
Small Government Entities	$0.0	$0.3	$0.5
Total Costs			
Small Government Entities	$11.8	$183.9	$346.3

TABLE XIX–3—IMPACTS OF REGULATORY OPTIONS ON SMALL GOVERNMENT UNITS—Continued

[Million 2008 $]

	Option 1	Option 2	Option 3
Small Government Impact Analysis Concepts			
Total Revenues	$125,515	$125,515	$125,515
Total Costs as % of Total Revenues	0.01%	0.15%	0.28%
Capital Outlay	$13,455	$13,455	$13,455
Total Costs as % of Total Capital Outlay	0.09%	1.37%	2.57%
Construction Outlay Only	$8,529	$8,529	$8,529
Total Costs as % of Total Construction Outlay	0.14%	2.16%	4.06%

Source: Economic Analysis.

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 the 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. The proposed rule 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 proposed rule would 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 comment on this proposed rule from State and local officials.

F. 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.

G. 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.

H. 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 most sites affected by today's proposed rule rely on treatment techniques that do not utilize mechanical equipment. The proposed rule may require larger sediment basins in certain cases and some sites would need to operate treatment systems designed to reduce the turbidity of stormwater discharges, and therefore may result in the use of additional fuel for construction equipment conducting excavation and soil moving activities or to operate electrical generators to power pumps. EPA determined that the additional fuel usage would be small, relative to the total fuel consumption at construction sites and the total annual U.S. fuel consumption.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995, (Pub. L. 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.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The proposed rule will reduce the negative effects of discharges from construction sites in the nation's waters to benefit all of society, including minority communities.

XX. Solicitation of Data and Comments

A. General Solicitation of Comment

EPA encourages public participation in this rulemaking. EPA asks that commenters address any deficiencies that they perceive 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 cost-effective data submissions. Please refer to the **FOR FURTHER INFORMATION CONTACT** section at the beginning of this preamble for technical contacts at EPA.

B. 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 solicited comments throughout this proposal, EPA specifically solicits comments on the following:

1. EPA is proposing an effluent limit for turbidity. EPA solicits comments on the need to regulate additional pollutants or require monitoring of additional parameters, specifically pH. High pH can result from discharges of concrete truck washout as well as from stormwater that flows over recently placed concrete. EPA solicits comments on whether an effluent limit for pH is needed. Such a limitation would not be developed using the statistical methodology used to develop the turbidity limitation. Instead, EPA typically establishes a range of acceptable values from 6 to 9 to protect against extreme acidity or alkalinity.

2. EPA is proposing that construction activity located in areas of the country that have an annual R-factor of less than 50 not be required to meet the turbidity standard. EPA solicits comment on the use of the annual R-factor as an applicability provision. EPA also solicits comment on incorporating a seasonal R-factor applicability provision, similar to the waiver provision for small construction sites currently in place under the Phase II regulation, into this regulation. (EPA's rainfall erosivity factor calculator can be found at *http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm).* EPA solicits comment on the appropriate seasonal R-factor to consider, as well how it would be implemented. EPA is aware that R-factor information may not be widely available in Alaska, Hawaii and the U.S. territories. EPA solicits comment on the availability of R-factors in these areas. EPA also solicits comments on using annual precipitation instead of R-factor as an applicability provision for Alaska, as well as for other areas where R-factor information is not readily available.

3. EPA solicits comments on other factors related to soil type, climate or soil erosivity that should be considered as potential applicability provisions. EPA considered annual precipitation as an applicability provision in concert with or in place of an annual R-factor applicability criterion. EPA solicits comments on the merits of an annual precipitation applicability criterion.

4. EPA is proposing that construction activity located in areas with less than 10 percent soil clay content, by mass, not be required to meet the turbidity standard. EPA solicits comments on the feasibility and ease of implementation of the proposed 10 percent clay content applicability criteria. Specifically, EPA requests comments on how permittees could demonstrate that soils on their construction sites contain less than 10 percent clay content. EPA envisions permittees using available soil survey data as a way of establishing applicability, or permittees conducting laboratory analysis of soils present on-site. For example, ASTM D–422 (Standard Test Method for Particle-Size Analysis of Soils) could be specified. EPA requests comment on these two approaches. Specifically, EPA requests comments on the availability of soil survey data for the entire U.S. (including Alaska, Hawaii and the U.S. territories) and also the appropriate laboratory methods or standards that should be used by permittees to analyze soils on their sites. EPA also solicits comments on the number of samples that should be collected, the type and location of samples to be collected (i.e., should EPA consider that the applicability provision apply to topsoil or should EPA consider all soils expected to be exposed during the duration of the construction project). EPA solicits comments on how to aggregate or weight soil data for different areas of the site and for different soil horizons. EPA also solicits comment on whether the proposed 10 percent clay content value is an appropriate value to use for an applicability provision of the turbidity standard.

5. EPA is proposing that C&D sites required to meet the turbidity limit provide storage and treatment for runoff expected from the local 2-year, 24-hour storm. EPA solicits comments on whether this volume is adequate, or whether additional storage (such as runoff from the 10-year, 24-hour storm or the 25-year, 24-hour storm) or less storage (such as runoff from the 1-year, 24-hour storm) should be required. EPA also solicits comments on whether specific analytical approaches or models (such as TR–55) should be used by permittees to calculate runoff volumes and storage requirements and whether specific assumptions in these models (such as specifying minimum runoff curve numbers that must be used) should be mandated through the regulation.

6. EPA solicits data on the costs and performance of stormwater treatment systems and construction site erosion and sediment controls. EPA requests comment on the $0.02 per gallon cost for ATS EPA used as a basis for calculating costs for Options 2 and 3. EPA specifically solicits comments on treatment systems other than chitosan-enhanced filtration that could be used by permittees to meet the proposed or an alternate turbidity limit. EPA requests costs and performance data for these systems, as well as information on specific locations, project types or soil types for which these systems would be applicable. EPA also solicits comments on the costs to install conventional sediment basins.

7. EPA has based its baseline assumptions on requirements currently contained in state construction general permits. EPA has not considered existing local or municipal requirements or regulations that may be more stringent than requirements contained in state general permits. EPA solicits comments and data on existing or proposed state, local and municipal requirements that are more stringent than the data used in EPA's analysis so that EPA may more accurately characterize the baseline of regulatory programs nationwide. EPA also solicits comments on the extent to which water quality standards or Total Maximum Daily Loads are requiring a higher level of control than currently required by state construction general permits.

8. EPA solicits comments on the modeling approach used to estimate sediment generation and reductions due to the proposed option, which is described in the Development Document. EPA also solicits information and data on concentrations of pollutants, including sediment, turbidity, TSS, nutrients, metals, organics and other pollutants typically found in construction site stormwater discharges. EPA recognizes that currently available data generally show significantly lower influent and effluent sediment concentrations (for traditional sedimentation basins) than are reflected in EPA's modeling analysis. EPA solicits comment on whether and how these data should be incorporated into its analysis. More generally, EPA solicits comments on ways in which the load and pollutant removal estimates generated in support of this proposal can be improved, and how EPA's load estimates and benefits estimation methodologies can incorporate consideration of pollutants other that sediment.

9. EPA has used NOI data from approximately 38 states. EPA solicits NOI data from other states, as well as other data that can be used to estimate the annual number of construction sites in the U.S. and the proportion of sites that would be subject to today's proposed regulations.

10. EPA solicits comments on the typical duration of construction projects, the percent of construction projects acres that are disturbed, and the typical duration that soils are exposed.

11. EPA solicits comments on the ability of dischargers to meet a numeric turbidity limit using passive, instead of active systems and the costs and performance of available technologies. EPA solicits comments on basing a turbidity limit on passive systems at a level in the range of 50–150 NTUs (or some other level) and the costs and pollutant load reductions that would be attributable to such a standard. EPA solicits comments on the applicability provisions of such a standard (i.e., should a 50–150 NTU (or some other level) standard apply to all permitted sites, only sites above 10 acres, should the standard include consideration of R-factor, annual precipitation or soil clay content, or other factors). EPA solicits information on the potential toxicity of polymers used in wastewater treatment, especially those used or marketed for use in stormwater treatment. EPA further solicits information on regulator and industry strategies and methods for avoiding any toxic effects of polymers used on construction sites. EPA requests comment on whether an approach based on passive controls could be implemented without specific numeric limits, or with action levels that would not themselves lead to permit violations but for which exceedances would result in additional controls, monitoring, inspection, and/or reporting requirements.

12. EPA solicits comments on the ability of dischargers located in areas with R-factors less than 50 and with less than 10% soil clay content to meet a numeric turbidity limit and what technologies would be necessary to meet the proposed standard under Option 2 using conventional BMPs or passive treatment systems. Specifically, EPA requests comment on whether or not these sites, due to low rainfall, soil erosivity and low clay content, could meet the proposed Option 2 turbidity standard using conventional BMPs and at a substantially lower costs than ATS.

13. EPA solicits comments on whether national standards regulating peak flowrates from sediment basins should be included in the effluent guideline in order to limit channel erosion and what specific criteria or standards, such as matching predevelopment peak discharge rates for a specific design storm (such as the 1-year, 24-hour or 2-year, 24-hour) should be included.

14. EPA solicits comments on whether perimeter controls should be designed to remove a specific particle size and on any specific design or performance criteria that should be established for perimeter controls.

15. EPA solicits comments on the costs and feasibility of requiring that flow from silt fences discharge through a vegetated filter strip or buffer before leaving the construction site.

16. EPA solicits comments on ways in which permittees could certify that soils on their C&D site would not exceed the percent clay criteria associated with the turbidity limit.

17. EPA solicits comments on requiring porous baffles in sediment basins as minimum requirements nationwide and whether the draft porous baffle design standards published by the North Carolina Department of Transportation (see DCN 43083) would be appropriate, or if other design standards are appropriate.

18. EPA solicits comments on whether the detention time requirements proposed for sediment basins are appropriate and if other detention time requirements should be considered. EPA solicits comments on whether sediment basin requirements should address any other factors, such as a minimum surface area or a discharge rate per unit watershed area. EPA solicits data on effectiveness of any alternative criteria.

19. EPA solicits comments on whether it would be feasible to require construction sites to maintain a minimum cover factor for soils based on the C-factor in RUSLE. For example, would it be feasible to require permittees to document in their SWPPP or erosion and sedimentation control plan the various phases of their project and calculate an area-weighted C-factor for each phase. Permittees would be required to meet a minimum average C-factor for the entire site during all phases of the project. Such a standard could vary based on the size of the site, with a lower average C-factor applying to larger sites. EPA solicits comments on the costs and feasibility of such an approach, and comments on what the specific C-factors should be for sites of various sizes (or other criteria) under such a standard. EPA solicits comments on the appropriate C-factors that would apply to various rolled erosion control products, hydromulches and other types of ground covers and erosion control

products currently in use by the industry.

20. EPA solicits comments on whether or not the guideline should establish maximum slope lengths before a grade break or linear sediment control must be provided for steep slopes. EPA solicits comments on appropriate slope lengths for various slope values. EPA points readers to the March 18, 2008, Draft California CGP (see DCN 41137) for an example.

21. Under the current permitting system, permittees (such as a developer) may sell or transfer control of a property to a builder or several builders and file for an NOT at some point during the course of the project, thus ending permit coverage for the developer. The builder or builders assuming control of the property would then be the permittee(s). If the project, while under control of the developer, was subject to the proposed turbidity limit because the project was over 40 acres in size and met the R-factor and clay content applicability provisions, and the project was sold to two builders, each controlling 20 acres, neither builder now controls more than 30 acres. As a result, there is some question as to whether or not the turbidity limit would still apply and which of the builders would be responsible for meeting the turbidity limit. EPA solicits comments from permitting authorities on if, and how, the proposed turbidity limit applicability provisions should be structured and the regulatory language structured so that the project remains subject to the turbidity limit until the entire project is completed.

22. EPA solicits comments on the need for text in the rule language regarding proper operation and maintenance and chemical dosages of chemical treatment systems, or whether these requirements should be addressed through guidance.

23. EPA's proposed option includes an applicability provision tied to the RUSLE R-factor. However, certain areas of the U.S., such as parts of Idaho, have a low annual R-factor but can experience high erosivity during certain times of the year, such as when rain occurs on snow or partially frozen ground. Also, for some cold mountainous climates, most of the erosivity is attributable to snowfall, instead of rainfall. EPA solicits comments on how to address applicability of the turbidity standard in areas such as these, and whether the rule language should include specific requirements regarding calculation of an R-factor for these areas or whether these issues should be addressed through guidance issued by EPA and/or left to the discretion of the permitting authority.

24. EPA solicits comments on the proper techniques for turbidity measurement in the field to demonstrate compliance with today's proposal. EPA has an approved analytical method for turbidity (EPA Method 180.1 Rev 2.0). However, EPA is not proposing that a specific analytical method be used to demonstrate compliance. EPA's intent with today's proposal is to allow turbidity measurements to be made in the field using properly calibrated portable turbidity meters, or a properly calibrated automated turbidity meter coupled with a data logger, which typically is a component of ATS. EPA solicits comments on whether EPA Method 180.1 Rev 2.0 is appropriate in this case, or whether a revised method or other guidance would be needed in order to reduce monitoring burden and allow for the use of equipment commonly available and in use by ATS operators.

25. EPA solicits comments on whether the effluent limit for turbidity should be a daily maximum value, as proposed today, or an instantaneous maximum based on continuous measurement. With a daily maximum, no individual measurements could be above the limit. With an instantaneous maximum, there could be a provision for brief exceedances of the limit. See 40 CFR 401.17 for an example of pH effluent limitations under continuous monitoring. EPA solicits comments on whether a similar approach should be applied for turbidity, and what specific excursion criteria would be appropriate.

26. EPA solicits comments on whether any of the proposed options for BAT, BPT, BCT or NSPS should be based on the total size of the project, the disturbed area of the project, the quantity of soil disturbed at any one time, or the amount of disturbed area draining to any particular location. EPA solicits comment on the 30 acre site size provision for Option 2.

27. EPA solicits comments on whether an approach based on passive treatment systems could be implemented as BAT, BCT, BPT or NSPS without specific numeric limits. EPA solicits comments on how permit authorities would implement and enforce such a standard. EPA specifically requests comment on action level or benchmark approaches, including what benchmark or action level should be used, and what measurement protocol should be used, and what measurement protocol should be established. EPA also solicits comment on how to account for soil conditions, storm events, and other variables in setting an action level or benchmark.

28. EPA solicits comments on cases where discharges of stormwater from construction sites with low turbidity and TSS values to waters with high natural background concentrations of sediment may contribute to receiving stream channel instability and increase stream channel erosion. EPA solicits comments on whether the R-factor applicability provisions, which exempt most arid and semi-arid areas of the country, adequately address these concerns, or whether the guideline should incorporate specific provisions to allow permitting authorities flexibility in applying the turbidity limit to sites where receiving channel instability may be of concern.

C. Guidelines for Submission of Analytical Data

EPA requests that commenters to today's proposed rule submit analytical and flow data to supplement data collected by the Agency during the regulatory development process. To ensure that commenter data may be effectively evaluated by the Agency, EPA has developed the following guidelines for submission of data.

1. Types of Data Requested

EPA requests paired influent and effluent treatment data for systems capable of reducing the turbidity of stormwater runoff from construction sites. EPA prefers paired influent and effluent treatment data, but also solicits unpaired data as well.

For the systems treating C&D stormwater, EPA requests paired influent and effluent treatment data from BMPs and treatment systems. Submission of effluent data alone is acceptable, but the commenters should provide evidence that the influent concentrations contain treatable levels of the pollutants. EPA also prefers individual measurements, rather than averages, to better evaluate variability, but will consider averages if individual measurements are unavailable. If commenters sample their stormwater to respond to this proposal, EPA encourages them to sample both the influent and effluent to BMPs and treatment systems and provide the individual measured values.

EPA prefers that the data be submitted in an electronic format. In addition to providing the measurement of the pollutant in each sample, EPA requests that sites provide the detection limit (rather than specifying zero or ''ND'') if the pollutant is non-detected in the stormwater. Each measurement should be identified with a sample collection date, the sampling point location, and the flow rate at that location. For each sample or pollutant, EPA requests that the chemical analytical method be identified.

In support of the treatment data, commenters should submit the following items if they are available: A process diagram of the treatment system that includes the sampling point locations; treatment chemical addition rates; laboratory reports; influent and effluent flow rates for each treatment unit during the sampling period; a brief discussion of the treatment technology sampled; and a list of C&D operations contributing to the sampled wastestream. If available, information on capital cost, annual (operation and maintenance) cost, and treatment capacity should be included for each treatment unit within the system.

2. Analytes Requested

EPA requests analytical data for any pollutant parameters that commenters believe are of concern in the C&D industry. Of particular interest are turbidity, TSS, and pH data. Commenters should document the method used for all data submissions. Submissions of analytical data should include any available documentation of QA/QC procedures; however, EPA will still consider data submitted without detailed QA/QC information. If commenters sample their stormwater to respond to this proposal, EPA encourages them to provide detailed documentation of the QA/QC checks for each sample.

List of Subjects in 40 CFR Part 450

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

Dated: November 19, 2008.

Stephen L. Johnson,

Administrator.

For the reasons set out in the preamble, EPA proposes to amend title 40, chapter I of the Code of Federal Regulations to add a new part 450 as follows:

PART 450—CONSTRUCTION AND DEVELOPMENT POINT SOURCE CATEGORY

Subpart A—General Provisions

Subpart B—Construction and Development Effluent Guidelines

Authority: 33 U.S.C. 1311, 1314, 1316, 1318, 1342, 1361 and 1370.

Subpart A—General Provisions

§ 450.10 Applicability.

This part applies to discharges associated with construction activity required to obtain NPDES permit coverage pursuant to 40 CFR 122.26(b)(14)(x) and (b)(15).

§ 450.11 General definitions.

The following definitions apply to this part:

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

(b) *Construction activity* includes, but is not limited to, clearing, grading, excavation, and other site preparation work related to construction of residential buildings and non-residential buildings, and heavy construction (e.g., highways, streets, bridges, tunnels, pipelines, transmission lines and industrial non-building structures).

(c) *Minimize* means to reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

(d) *New Source* means any source from which there will be a discharge associated with construction activity that will result in a building, structure, facility, or installation subject to new source performance standards elsewhere under subchapter N of this chapter.

(e) *Erosion* as used in this part means the process of carrying away soil particles by the action of water.

(f) *Sediment basin* means a structure designed to detain sediment laden stormwater long enough to allow sediment to settle in the basin and then discharge stormwater at a controlled rate through an engineered outlet device.

Subpart B—Construction and Development Effluent Guidelines

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

Except as provided in 40 CFR 125.30 through 125.32, any point source subject to this subpart must achieve the following effluent limitations representing the application of the best practicable control technology currently available (BPT).

(a) *Erosion Controls.* During all phases of construction activity, provide and maintain effective erosion controls in accordance with established industry practices on all disturbed areas of the construction site to minimize the discharge of sediment and other pollutants. Erosion controls are considered effective when bare soil is uniformly and evenly covered with vegetation or other suitable materials, stormwater is controlled so that rills and gullies are not visible, sediment is not visible in runoff from these areas and channels and streambanks are not eroding. Disturbed areas must be stabilized using erosion controls immediately after any clearing, grading, excavating or other earth disturbing activities have permanently or temporarily ceased. Assessment of erosion potential and appropriate erosion controls must take into account the rainfall, topography, soil types, climate, and vegetation or other cover at each site. Erosion controls implemented at the site must, at a minimum be designed and installed to achieve the following:

(1) Stabilize disturbed soils immediately when earth disturbing work has temporarily or permanently ceased. Stabilization measures must be implemented immediately on any portion of the site whenever final grade is reached or when earth disturbing work has been stopped on that portion of the site and will not resume for a period exceeding 14 calendar days.

(2) Control stormwater volume and velocity within the site to minimize soil erosion.

(3) Minimize the amount of soil exposed for the duration of the construction activity as well as at any one time during the construction activity.

(4) Control stormwater discharges, including both peak flowrates and total stormwater volume, leaving the site to prevent channel and streambank erosion and erosion at outlets.

(5) Preserve topsoil and natural vegetation.

(6) Minimize soil compaction by construction equipment in areas that will not contain permanent structures or where compaction is not necessary for structural integrity. In disturbed areas that will not contain structures or where compaction is not necessary for structural integrity, utilize deep ripping and decompaction of soils and

incorporate organic matter to restore infiltrative capacity.

(7) Provide and maintain natural buffers around surface waters.

(8) Minimize the construction of stream crossings.

(9) Sequence/phase construction activities to minimize the extent and duration of exposed soils.

(10) Minimize disturbance of steep slopes.

(11) Implement erosion controls specifically designed to prevent soil erosion on slopes.

(12) Establish temporary or permanent vegetation, such as grass or sod, or use non-vegetative controls such as mulch, compost, geotextiles, rolled erosion control products, polymers or soil tackifiers to stabilize exposed soils.

(13) Divert stormwater that runs onto the site away from disturbed areas of the site.

(b) *Sediment Controls*. Provide and maintain effective sediment controls in accordance with established industry practice to minimize the discharge of sediment from the site. Effective sediment controls include a variety of practices that are designed to remove sediment within the range of particle sizes expected to be present on the site, taking into account rainfall, topography, soil types, climate and vegetation at each site and the proximity to storm drain inlets and receiving waters. Sediment controls must be installed, operated, and maintained in accordance with established industry practices to minimize the discharge of sediment and other pollutants from the site. Install appropriate sediment controls prior to the commencement of construction and maintain during all phases of construction activity. Effective sediment controls must include, at a minimum, the following:

(1) Establish and maintain perimeter control measures for any portion of the down-slope and side-slope perimeter where stormwater will be discharged from disturbed areas of the site. Perimeter controls include, but are not limited to, BMPs such as diversion dikes, storm drain inlet protection, filter berms, and silt fencing. Perimeter control measures along the down-slope perimeter of the site must be installed following the contours of the land. Discharge stormwater from perimeter controls through vegetated areas and functioning stream buffers.

(2) Control discharges from silt fences using a vegetated filter strip or vegetated buffer at least six feet in width.

(3) Minimize the length of slopes and install linear sediment controls along the toe, face and at the grade breaks of exposed and erodible slopes.

(4) Establish, use and maintain stabilized construction entrances and exits. Install, utilize and maintain wheel wash stations to remove sediment from construction equipment and vehicles leaving the site.

(5) Remove any sediment and other pollutants, including construction materials, from paved surfaces daily to minimize discharges from the site. Washing sediment and other pollutants off paved surfaces into storm drains is prohibited unless those storm drains discharge to a sediment basin or other sediment control on the site.

(6) Establish, use and maintain controls and practices to minimize the introduction of sediment and other pollutants to storm drain inlets.

(7) Control sediment and other pollutants from dewatering activities and obtain and comply with any state or local discharge standards or permits for dewatering activities. Discharges from dewatering activities are prohibited unless treated to minimize the discharge of pollutants and sediment within the range of particle sizes expected to be present on the site.

(8) For common drainage locations that serve an area with 10 or more acres disturbed at one time, install and maintain a sediment basin to control and treat the stormwater runoff. The permitting authority may allow alternative controls where alternative controls provide an equivalent or better level of pollutant reduction. The sediment basin must incorporate, at a minimum, the following requirements:

(i) Provide a water storage volume for the calculated volume of stormwater runoff from the local 2-year, 24-hour storm for the entire watershed area draining to the basin until final stabilization of the disturbed area. Alternatively, a sediment basin providing a water quality storage volume of 3,600 cubic feet per acre of total watershed area draining to the basin must be provided until final stabilization of the disturbed area. If water will be flowing onto the construction site from up-slope and into the basin, the calculation of sediment basin volume must also account for this volume.

(ii) In addition to the water storage volume, a sediment storage volume of at least an additional 1,000 cubic feet per acre of disturbed land area directed to the basin must be provided. If water will be flowing onto the construction site from up-slope and into the basin, the calculation of the sediment storage volume must also account for this volume.

(iii) The effective length of the basin must be at least four times the width of the basin.

(iv) Sediment basins must include and utilize an outlet device, such as a skimmer, designed to withdraw water from the surface of the water column. If a basin is to be used during freezing conditions which would interfere with the operation of an outlet device designed to withdraw water from the surface of the water column, then an alternative means of dewatering may be used only during periods of freezing conditions.

(v) Discharges from sediment basins must be regulated in a manner that maximizes the residence time of the water in the basin. The dewatering time must consider the range of soil particle sizes and the settling time for soil particles expected to be present on the construction site. The dewatering time for the water storage volume must be at least 72 hours, unless otherwise specified by the permitting authority. However, in no case shall the dewatering time be less than 24 hours. The design of the sediment basin must address factors such as the amount, frequency, intensity and duration of stormwater runoff, soil types, soil particle sizes, and other factors affecting pollutant removal performance.

(9) Direct stormwater discharges from sediment controls to seep berms and level spreaders or utilize spray or drip irrigation systems to distribute stormwater to vegetated areas and functioning stream buffers to increase sediment removal and to maximize infiltration.

(c) *Pollution Prevention Measures*. During all phases of construction activity, provide and maintain effective pollution prevention measures in accordance with established industry practice to control the discharge of pollutants from the site. Effective pollution prevention measures include a variety of recognized and accepted industry practices that minimize the discharge of pollutants from the site taking into account the specific circumstances at each site. Pollution prevention measures must be implemented to achieve, at a minimum, the following:

(1) Prohibit the discharge of construction wastes, trash, and sanitary waste in stormwater;

(2) Prohibit the discharge of wastewater from washout of concrete, stucco, paint, and cleanout of other construction materials;

(3) Prohibit the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

(4) Prohibit the discharge of pollutants resulting from the washing of equipment and vehicles where soaps or solvents are used;

(5) Prohibit the discharge of pollutants resulting from the washing of equipment and vehicles using only water to remove sediment, unless wash waters, such as water from wheel wash stations, are treated in a sediment basin or alternative controls that provide equivalent or better treatment;

(6) Implement measures to minimize the exposure of stormwater to building materials, landscape materials, fertilizers, pesticides, herbicides, detergents, and other liquid or dry products. Implement appropriate chemical spill prevention and response procedures. Any spills and leaks that do occur shall be immediately addressed in a manner that prevents the discharge of pollutants.

(7) Prevent stormwater runoff from contacting areas with uncured concrete to minimize changes in stormwater pH.

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

Except as provided in 40 CFR 125.30 through 125.32, any point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT):

(a) For construction activity located at a site with 10 percent or greater by mass of soils less than 2 microns in diameter (down to the graded and excavated level of the site), and that has an annual rainfall erosivity factor (R factor) of 50 or higher as defined by the Revised Universal Soil Loss Equation (for construction activity located in Alaska or a U.S. territory where the R factor applicable to the activity has not been calculated, the 30-year average total annual precipitation of 20 inches or more shall be used in place of the R factor):

(1) The effluent limitations specified in § 450.21 shall apply.

(2) Except as provided by paragraph (a)(3) of this section, for any construction activity of 30 or more acres, the discharge of stormwater shall not exceed the value listed in the following table:

Pollutant or pollutant property	Maximum for any time (NTU) [1]
Turbidity	13

[1] Nephelometric turbidity units.

(3) The requirements of paragraph (a)(2) of this section do not apply to the discharge of pollutants in the overflow from the sediment basin or other storage impoundment whenever rainfall events, either chronic or catastrophic, cause an overflow of stormwater from a sediment basin or other impoundment designed, constructed and operated to contain runoff from a 2-year, 24-hour rainfall event.

(b) For any construction activity subject to this Subpart and not specified in paragraph (a) of this section, 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 point source subject to this subpart must achieve the following effluent limitations 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 standards are the same as the limitations specified in § 450.22.

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