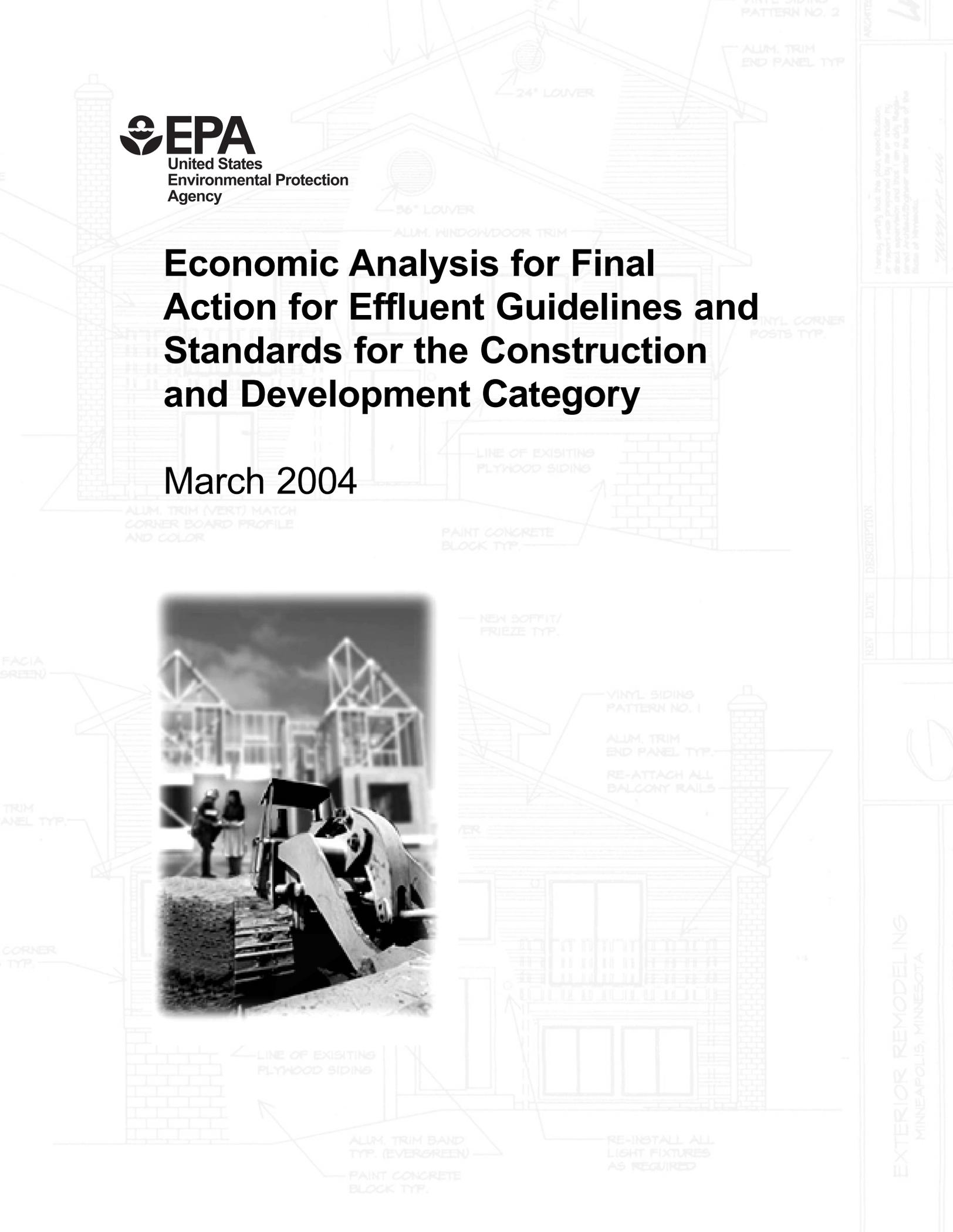


Economic Analysis for Final Action for Effluent Guidelines and Standards for the Construction and Development Category

March 2004



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ACRONYMS

BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BEA	Bureau of Economic Analysis
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
BPT	Best Practicable Control Technology Currently Available
C&D	Construction and Development
C&D/FrMS	C&D Firm Model System
C&D/PEqMMS	C&D Partial Equilibrium Market Model System
C&D/PrMS	C&D Project Model System
CFR	Code of Federal Regulations
CGP	Construction General Permit
CWA	Clean Water Act
CWP	Center for Watershed Protection
D&B	Dun and Bradstreet
DO	Dissolved Oxygen
EA	Economic Analysis
ELG	Effluent Limitations Guidelines
ENRCCI	Engineering News-Record Construction Cost Index
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESCs	Erosion and Sediment Controls
FEC	Fecal Coliform Bacteria
FHWA	Federal Highway Administration
FRFA	Final Regulatory Flexibility Analysis
GDP	Gross Domestic Product
HOI	Housing Opportunity Index
I&C	Inspection and Certification Provisions
IRFA	Initial Regulatory Flexibility Analysis
MSA	Metropolitan Statistical Area
NAHB	National Association of Home Builders
NAHBHOI	NAHB Baseline Housing Opportunity Index
NAICS	North American Industry Classification System
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRI	Natural Resources Inventory
NSPS	New Source Performance Standards
NWPCAM	National Water Pollution Control Assessment Model
O&M	Operating and Maintenance
OMB	Office of Management and Budget
POTWs	Publicly Owned Treatment Works
PSES	Pretreatment Standards for Existing Sources

PSNS	Pretreatment Standards for New Sources
RFA	Regulatory Flexibility Act
RHOI	Rough Housing Opportunity Index
RIMS II	Regional Input-Output Modeling System
SIC	Standard Industrial Classification
SBA	United States Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TON	Total Organic Nitrogen
TOP	Total Organic Phosphorus
TSS	Total Suspended Solids
UMRA	Unfunded Mandates Reform Act
USDA	U.S. Department of Agriculture
WQI6	Six-parameter Water Quality Index
Z'	Altman's Z-score for the Manufacturing Sector
Z''	Altman's Z-score for the Service Industry Sector

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This economic analysis (EA) presents the U.S. Environmental Protection Agency's (EPA's) evaluation of the incremental compliance costs and economic impacts of four options for controlling discharges of stormwater during construction and development (C&D) activities. These options are known as Option 1, Option 2, Option 3, and Option 4.

- Option 1 requires enhanced inspection requirements and certifications of best management practices (BMPs).
- Option 2 comprises technology-based effluent limitations guidelines and standards (ELG) for stormwater discharges from construction sites where 5 acres or more of land are disturbed. It also includes enhanced inspection requirements and certification of BMPs.
- Option 3 would not establish new regulations, but would instead continue to rely on the existing National Pollutant Discharge Elimination System (NPDES) stormwater regulations.
- Option 4 is identical to Option 2 except that the inspection and certification requirements are not included.

EPA has chosen Option 3 for the Final Action in this rulemaking process. This choice results in no costs, no impacts, and no benefits to the C&D industry or the U. S. economy. This executive summary acknowledges this choice, whereas the body of the EA presents the four options without reference to this decision.

The C&D industry is currently regulated under NPDES permit requirements for construction activities that disturb more than 1 acre. C&D activities in states where EPA is the permitting authority are subject to EPA's Construction General Permit (CGP), which describes the permit requirements under EPA's Phase I stormwater regulations (covering sites in which 5 or more acres of land are disturbed) and Phase II regulations (covering sites in which 1 to 5 acres of land are disturbed). Delegated states are authorized to issue NPDES permits and have their own permitting requirements. In many of these states,

the requirements are generally equivalent to the EPA CGP requirements. The analyses in this EA assume that C&D activities are fully compliant with Phase I and Phase II stormwater requirements. Therefore, only the requirements of Options 1, 2 and 4 that are incremental to Phase I and Phase II stormwater requirements are associated with costs, impacts, or benefits.

The Phase I and II rules require construction site operators to obtain permits to manage construction site storm water runoff. The EPA CGP requires that construction site owners and operators prepare a stormwater pollution prevention plan (SWPPP) and install a range of BMPs. Specifically, the EPA CGP requires that sediment basins designed to control runoff from the 2-year, 24-hour storm or 3,600 cubic feet per acre be installed on drainage areas of 10 or more acres. For smaller sites, the EPA CGP specifies that smaller sediment basins or sediment traps are to be used, or equivalent control measures. The EPA CGP also requires that site owners and operators conduct periodic inspections of the site, stabilize exposed soil areas, and conduct maintenance of BMPs. Many state general permits contain similar provisions, although the specific design requirements vary.

Options 2 and 4 would have established the specific provisions of the EPA CGP as minimum requirements for all construction sites nationwide. Option 2 would also have required a number of enhanced site inspection and certification provisions. These provisions would have required inspections of individual BMPs, as well as certifications when a number of specific activities (such as completing a SWPPP, installing BMPs, and stabilizing exposed soils) have been completed. Option 1 would only have required enhanced site inspections and certifications. Option 1 would have generally applied to all sites with 1 or more acres of disturbed land, while Options 2 and 4 would have generally applied to all sites with 5 or more acres of disturbed land.

The industries that would have been affected by the regulatory options include land subdivision and development, single-family housing construction, multifamily housing construction, manufacturing and industrial building construction, commercial and institutional building construction, and a variety of heavy construction industries, such as highway construction, excavation contractors, and wrecking and demolition contractors. EPA gathered information on these sectors from a variety of sources, including the 1997 Census of Construction (the 2002 Census is not yet available). EPA believes the 1997 Census provides a reasonable basis for characterizing the industries that could have been affected by the Final Action. EPA also used the U.S. Department of Agriculture's Natural Resource Inventory to determine

the amount of acreage disturbed annually, data collected from NPDES permits, and information collected during focus group meetings held with representatives of the National Association of Home Builders (NAHB). Other sources of data are discussed where data are presented.

EPA received 105 comments on the June 2002 proposal. Some of these comments focused on the data EPA used to develop the economic analysis and, in some cases, commenters provided alternative data. After EPA determined that alternative sources of data suggested by commenters were appropriate, EPA integrated these new data into the economic analysis. Some commenters expressed concern about sources of data but could not provide any alternatives. Where no alternative data were suggested, EPA retained the existing data.

In addition to issues related to data, commenters expressed concern that impacts of this rule would be too high, had a low cost-benefit ratio, or ignored certain segments of the industry. EPA acknowledges that impacts would have occurred under Options 2 or 4, but does not provide conclusions on the economic achievability of these options here and refers readers to EPA's document, Summary of Public Comments with Responses Based on the Proposed Effluent Limitations Guidelines for Construction and Development (Comment Response Document). A low cost-benefit ratio does not preclude promulgating a rule. Additionally, EPA documented the reasons for excluding segments of the industry from the analysis at proposal and in this EA.

Several commenters were confused by the presentation of the economic analyses. EPA has substantially rewritten the EA to ensure greater clarity. Some commenters suggested changes to EPA's methodology for analyzing impacts. In most cases, EPA determined that some changes were not warranted. The Agency did change the assumed duration of single-family and multifamily projects. Moreover, EPA now also assumes these projects are not cross-subsidized by other projects underway, as suggested by commenters. EPA also received numerous comments on the elimination of post-construction requirements. These requirements were removed from the draft proposal because the costs of compliance were considered too high. These comments and all others are discussed in detail in EPA's Comment Response Document.

The remainder of this Executive Summary addresses the industry profile (Section ES.2), the regulatory options (Section ES.3), the economic impact methodology (Section ES.4), results of the

economic analyses (Section ES.5), the results of the Final Regulatory Flexibility Analysis (Section ES.6), a summary of the benefits (ES.7), the costs and benefits of the options considered (Section ES.8), and information required under the Unfunded Mandates Reform Act (UMRA) (Section ES.9).

ES.2 PROFILE OF THE CONSTRUCTION & DEVELOPMENT INDUSTRY

Several characteristics of the C&D industry affect the structure of this EA:

- Because individuals (e.g., homebuyers) are often the direct customers of the C&D industry, it is necessary to address issues such as cost passthrough and the impacts of regulations on housing affordability.
- Developers and builders are engaged in complex and varying relationships, resulting in a variety of different business models. Developers might undertake all site improvements and sell completed lots directly to builders, act as builders themselves and remain onsite to build out the development, or some combination of the two.
- The C&D industry is dominated by small businesses. As a result, EPA must carefully consider the impacts on small businesses in accordance with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA).
- C&D activities are highly localized, which suggests that a regional approach to analysis is needed to account for varying market conditions.
- The standard industry definitions include a large number of establishments primarily engaged in remodeling activities and special trades (e.g., plumbing, electrical). These establishments are less likely to be involved in land disturbing activities.

The C&D industry, as defined for this rule, is comprised of four main industry groups that will further affect the structure of this analysis:

- Land development and subdivision
- Residential construction (including single-family and multifamily construction)
- Nonresidential construction (including commercial and industrial construction)
- Heavy construction

These four industry groups are most likely to engage in land disturbing activities.

Land development and subdevelopment (categorized in the North American Industry Classification System [NAICS] as NAICS 2331) accounted for 8,185 establishments, or 3.1 percent of all establishments in the C&D industries. Heavy construction (NAICS 234) includes 42,557 establishments, or 16.3 percent of the total. Of these, 27 percent are primarily highway and street construction contractors; another 27 percent are contractors that work on water, sewer, pipeline, communications and power line projects; and 43 percent are engaged in other types of heavy construction. Within the special trades contractors subsector (NAICS 235), NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) together account for 19,771 establishments, or 7.6 percent of the C&D industry total. Excavation contractors account for more than 90 percent of these establishments. The number of establishments in the C&D industry total 261,617, although many of these will not be affected by any of the options considered.

The C&D industry is dominated by small establishments—more than 87 percent of establishments employ fewer than 20 employees. Two-thirds of the C&D establishments are organized as corporations, with 25 percent organized as proprietorships. Only 9 percent are organized as partnerships or some other legal form of organization. Geographically, the highest number of establishments per state is found in California. Other states with large numbers of C&D establishments include Texas, Illinois, Michigan, Ohio, Pennsylvania, New York, and Florida. International competitiveness is not an issue in this industry, as construction activities are highly localized.

The C&D industry is estimated to employ nearly 2.4 million people with a payroll totaling \$76.8 billion in 1997. More than half are employed in NAICS 233, except 2331 (building, developing, and general contracting, except land subdivision and land development). The heavy construction sector employs nearly 40 percent of the total. The industry employment figures confirm a highly seasonal employment pattern.

The vast majority of firms in the C&D industry operate only one establishment. Most analyses in this report assume that one firm is equivalent to one establishment. The number of small firms, based on Small Business Administration (SBA) definitions, are estimated to comprise 99.5 percent of all firms in the industry.

Many of the establishments and firms in the C&D industry would have been unaffected by the Final Action, regardless of option chosen, for several reasons. First, potentially affected establishments are those that disturb land. EPA believes that establishments characterized as remodelers would not have been affected regardless of option. Based on the 261,617 establishments estimated for the C&D industries, and subtracting 62,400 remodelers, EPA estimates that 199,217 establishments could have been affected. Options 2 and 4, however, exclude sites where less than 5 acres of land are disturbed. EPA, therefore, assumes that builders of single-family housing making one to four or five to nine starts per year would be unlikely to disturb that much acreage at a single site. Additionally, EPA assumes that multifamily builders constructing two to nine housing units each year are also excluded from coverage under these options on this basis. Finally, EPA also assumes special trade contractors (such as plumbers and electricians) would be unlikely to disturb land and would not be the responsible party for NPDES permitting purposes because they typically act as subcontractors. EPA's count of potentially affected establishments under Options 2 or 4 is 114,170.

ES.3 DESCRIPTION OF THE REGULATORY OPTIONS

EPA is authorized under the Clean Water Act (CWA) to promulgate ELGs. Under this authority, EPA considered Best Practicable Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), and New Source Performance Standards (NSPS) requirements.

EPA considered four regulatory options, of which two (Options 2 and 4) were designed to implement ELGs. These four options were described in detail in Section ES.1.

ES.4 ECONOMIC IMPACT ANALYSIS METHODOLOGY

EPA has undertaken a wide range of impact analyses in this EA. Many of these multi-level, economic analyses measure impacts that might be associated with options considered for this Final Action from several perspectives (e.g., the builder or the consumer). Alternatively, in some cases, multiple analyses are used to provide varied approaches for estimating similar impacts. EPA uses several

models and modeling systems, discussed in the following sections, for measuring economic impacts. The impacts analyzed are divided into two major groups: 1) impacts on the individual projects, establishments, and firms in the construction industries, and 2) impacts at the national level and on the national economy.

EPA employs methods and models for economic analyses that are used daily in the marketplace by business, government, and industry. For example, in estimating the economic impacts of costs of the regulatory alternatives on businesses, EPA uses, among many others, formulas and methods similar to those used by a mortgage banker to estimate the monthly mortgage on a new home. These formulas and methods can be used to replicate the results in this economic analysis or to conduct independent analyses of the impacts of the options considered in this document, or any other options.

EPA has made several assumptions to run the various models and modeling systems concerning the ability of the construction industry to pass through costs to the retail market and consumers. These assumptions vary depending on the analysis run by each model or modeling system. These assumptions fall into three categories regarding cost passthrough scenarios:

- The industry can pass through 100 percent of the costs of compliance. Analyses using this type of assumption measure the worst-case impacts on consumers.
- The industry can pass through none of the costs. This results in an analysis measuring the worst-case impacts on the industry.
- The industry can pass through some of the costs—a realistic cost passthrough assumption based on market conditions. In this scenario, some costs fall on consumers, and some on the industry. The types of cost passthrough assumptions used in each model or modeling system are discussed in the following sections.

Before the specific impact methodologies and the models and modeling systems are discussed, we summarize how the incremental compliance costs were calculated and applied in the economic impact analysis. The remainder of this section discusses two levels of modeling used in the impact analysis—industry level (two modeling systems) and national level (four major models/modeling systems). This section also discusses the final calculation of total social costs.

ES4.1 Use of Engineering Costs in the Impact Analyses

EPA's engineering cost analysis produced incremental costs in each state. Within each state, EPA estimated costs for six site sizes and four major land-use types identified as potentially affected, for a total of 24 subtotaled costs in each of the 50 states. The site sizes modeled used 0.5, 3, 7.5, 25, 70, and 200 acres (zero costs were assigned to the 0.5-acre sites for all options discussed in this EA). The land use types included single-family housing, multifamily housing, commercial construction, and industrial construction. The derivation of these costs can be found in EPA's Development Document for the Effluent Guidelines for the Construction and Development Point Source Category (Technical Development Document).

In most cases, EPA had insufficient data to model separate projects and firms for the 50 states in the economic analysis. In response to insufficient data, EPA created weighted average costs per acre on a national basis. For one of the market modeling approaches, however, EPA was able to use the state-by-state data.

EPA developed four sets of cost inputs for the economic analyses based on the engineering costs. One set used the total engineering costs of the inspection and certification requirements in Option 2, calculated by site size and construction type, divided by all acres estimated to be disturbed annually (by site size and land use type).

Another set used the total engineering cost of the CGP codification cost component in Options 2 and 4, also calculated by site size and land use type. These incremental costs were divided by the number of acres estimated to be developed annually (by site size and land use type) in states whose stormwater regulations were not considered to be equivalent to the CGP requirements. This approach created two tiers of costs. Construction projects in most states face only the relatively low inspection and certification costs, since the relevant state regulations match the CGP requirements (the "equivalent states"). Construction projects and firms in a few states, however, face the higher costs of meeting the inspection and certification costs combined with the costs of meeting the CGP-based requirements in Option 2, or the costs of meeting the CGP-based requirements in Option 4.

A third set of costs used the total engineering costs of each option divided by the total estimated number of acres disturbed annually to produce an overall national average cost per acre by site size and industry type. Certain models were able to use the overall national average costs (e.g., the total compliance cost model), but others used the costs per acre as adjusted by state equivalency determinations to avoid, for example, underestimating impacts on individual firms in nonequivalent states.

The last set of costs used the state-by-state total engineering costs divided by the acres disturbed in each state. EPA was able to run one market analysis at this level of detail.

ES4.2 Industry-Level Analyses

EPA developed two analyses at the industry level—an analysis of impacts on construction projects and an analysis of impacts on construction firms. These analyses are conducted using two modeling systems:

- EPA's C&D Project Model System (C&D/PrMS), which measures impacts on construction projects, including those on builder profits and house prices.
- EPA's C&D Firm Model System (C&D/FrMS), which measures potential impacts on firms (in terms of identifying changes in financial conditions associated with the options that might lead to financial stress). It also identifies the number of employees that might be affected at potentially financially stressed firms.

ES4.2.1 C&D Project Model System

EPA's C&D/PrMS is composed of a number of model C&D projects, each simulating the cash flow of a C&D project for a certain site size and land use type. The matrix of six site sizes and four land use types produce a total of 24 models. The cost inputs to the C&D/PrMS are the national average per-acre costs by land use and project size. EPA uses these costs in this analysis because overall national average changes in project financials are being calculated. When EPA inputs these costs into the C&D/PrMS, the Agency can compute impacts at a wide variety of construction projects. For each type

of construction project and site size, the average cost per acre for that project is input into a model that simulates all of the costs of constructing that model project. The per-acre costs are multiplied by the acreage associated with the site size (e.g., 7.5 acres is the acreage at a 7.5 acre site) to estimate a cost per site. The increased cost then affects other cost items throughout a model project and can be measured as either a change in the builder's asking price for a new house (assuming 100 percent cost passthrough to consumers) or a change in the profitability of the project assuming the builder absorbs all incremental costs (zero cost passthrough). The model also estimates multipliers that are used in other analyses. Using the Opportunity and Interest Cost Multiplier, EPA can estimate the costs per acre, plus opportunity and interest costs per acre (costs associated with self-financing or loans due to increased compliance costs). Using the Total Cost Multiplier, EPA can estimate costs per acre, plus all additional components (opportunity costs, interest costs, profit, and overhead) that contribute to the final asking price changes. The former multiplier is particularly important for calculating the total costs of compliance, since the costs represented by this multiplier must be included with the total engineering costs of compliance that are estimated by the engineering cost models. The latter multiplier is important for estimating the total impact on consumers and the economy as a whole.

ES4.2.2 C&D Firm Model System

EPA's C&D/FrMS comprises a number of model C&D firms, each simulating the income statement and balance sheet for a C&D firm of a certain size, measured as numbers of starts (or units) per year and land use type. The cost inputs to the C&D/FrMS are the per-acre costs for the inspection and certification cost components over all developed acres and the per-acre costs for the CGP cost components over the developed acres in nonequivalent states. This approach allows EPA to better estimate the number of firms that might experience financial stress, taking into account whether they are located in a high-cost or low-cost state. The model system is run twice—once at the low cost per acre and once at the high cost per acre. The impacts on firms in terms of numbers of firms estimated to experience financial distress are then calculated based on the percentage of firms located in low cost states versus those located in high cost states.

These costs are used by the C&D/FrMS to compute impacts at the level of the construction firm. Costs per acre by site size are multiplied by the number of acres per construction start and the number of

starts assumed for each model firm (by industry type) to estimate a compliance cost for each firm. Each of the four types of firms (single-family, multifamily, commercial, and industrial construction firms) are investigated. The firm costs are used in the C&D/FrMS to yield information on changes in firm-level financial ratios.¹ These changes are then used to determine numbers of firms that might experience financial stress as a result of incremental option costs and numbers of employees at firms potentially experiencing financial stress. These costs can also be compared to total and current assets of the model firms to determine if a barrier to entry by new firms might be present. Later, these firm-level costs are also used to determine impacts on small businesses.

The firm-level analysis uses two cost passthrough assumptions to gauge worst-case impacts (the zero cost passthrough assumption) and realistic impacts (a market-based cost passthrough assumption).

ES.4.3 National-Level Analyses

The methodologies for most of the national-level analyses are divided into several types and are implemented using a number of models and modeling systems:

- The Total Compliance Cost Model estimates national compliance costs to industry.
- The Consumer Impact Model analyzes impacts on consumers that are driven by the potential for price increases for single-family homes.
- The C&D Partial Equilibrium Market Model System (C&D/PEqMMS), which comprises three modules, uses partial equilibrium market models to measure impacts in C&D markets:
 - Module 1 is the National Housing Market Module, which estimates changes in prices and quantities in the housing sector markets.
 - Module 2 is the Regional Market Model Module, which estimates changes in prices and quantities in the non-housing sectors and also estimates the numbers of households priced out of the housing market.

¹ EPA could not use an Altman's Z approach for assessing the interactions of these financial ratios to determine financial stress for this EA. Altman has developed ratio coefficients for the manufacturing (public and private) and the service sectors only. These coefficients would not be valid for the C&D industries. See Chapter Four for more information.

- Module 3 is the Net Economic Impact Model, which estimates impacts on the national economy as a whole, calculating changes in price and quantity in all sectors and estimating the losses in output and employment.
- The Government Impact Model, which estimates total costs to governments.

Generally these models and modeling systems use the national-level costs per acre, since they are either computing national-level costs or are estimating changes in national-level markets. Other than the simpler aggregated cost calculations, they use only the market-driven (realistic) cost passthrough assumptions, since market-based impacts are being measured in most of these analyses. Selected outputs of these models are then combined to calculate the total social costs associated with each option. The models and modeling systems listed above are discussed in more detail in the following sections.

ES4.3.1 Total Compliance Cost Model

To compute the total compliance costs to industry, EPA uses the national average cost per acre computed over all developed acres (by land use type and project size) adjusted by the opportunity and interest cost multipliers calculated by the C&D/PrMS. These costs are multiplied by the total number of acres estimated to be developed annually by project size and land use type. When these costs are aggregated, EPA determines the total cost to the construction industry of each option under consideration. EPA's Total Compliance Cost Model calculates costs by industry type, and the total cost or the total cost by sector becomes an input to many of the remaining national-level analyses.

ES4.3.2 Consumer Impact Model

The Consumer Impact Model uses the national average cost per acre for each site size in the single-family land use type divided by the number of lots per acre assumed. These costs are adjusted by the Total Cost Multiplier calculated by the C&D/PrMS to judge the impact of the increase in residential housing price on the median-priced home. The model calculates the change in income that would be needed to qualify for a home mortgage at the new price and the number of households that no longer qualify for a house at that price, assuming standard lending practices.

ES4.3.3 C&D Partial Equilibrium Market Modeling System

EPA undertakes an analysis of the national housing market as well as a regional-level analysis of the markets for single-family, multifamily, commercial, and industrial construction using partial equilibrium models of these markets. EPA also determines the net economic impacts in the overall U.S. economy. These analyses are incorporated into three modules that make up EPA's C&D/PEqMMS. The first module, the National Housing Model, uses the total costs for the single-family sector output by the Total Compliance Cost Model. The Regional Market Modeling Module (the second of the C&D/PEqMMS modules) uses the state-by-state compliance costs per acre for each sector. These two components estimate output changes at the industry level. The last component of the C&D/PEqMMS is the Net Economic Impact Model. This module is discussed in more detail in the following section.

ES4.3.4 Net Economic Impact Model

Compliance costs have a ripple effect on the U.S. economy, resulting in both positive and negative impacts on production and employment in various sectors, both within and outside of the construction industries. The third module of the C&D/PEqMMS, the Net Economic Impact Model, uses the results of the partial equilibrium models (expressed as changes in industry output), as described above, and economic input-output multipliers developed by the Bureau of Economic Analysis. Where EPA has calculated results on both the national-level and regional levels (housing sectors only), EPA uses the national-level results, since the regional-level data are more limited in scope. Economic multipliers indicate the degree to which declines in construction activity will have a ripple effect causing declines in employment in the construction industry and declines in output and employment in other industries. Meanwhile, other parts of the economy (e.g., suppliers of ESCs) gain output and employment. The impacts of compliance are thus measured as both gains and losses in output and gains and losses in employment across the national economy. These gains and losses generally balance each other, but some overall loss to the national economy does occur. This loss is called the deadweight loss, which contributes to the overall social cost of a regulation. The outputs of the Net Economic Impact Model are the change in employment and output in the national economy and an estimate of the deadweight loss.

ES4.3.5 Government Impact Analysis

EPA estimates government impacts using costs that were derived separately from the costs discussed in the previous section. EPA did not re-evaluate government administrative costs. They remain the same as those shown at proposal. EPA developed government costs by estimating the costs associated with establishing or modifying permitting programs to reflect the requirements of the options considered as well as new or increased costs related to permit processing. EPA added to these costs an estimate of costs to various levels of government of complying with the options under consideration (governments at all levels undertake construction projects themselves). The total of the administrative costs of permitting and other activities and the compliance costs estimated to apply to government are the total costs to government.

ES.4.4 Estimate of Social Costs

The final analysis EPA performs with the cost inputs is estimating total social cost. The total social costs are calculated by adding the total compliance costs to industry, the total costs to governments, and the total deadweight loss, calculated as discussed.

ES.5 ECONOMIC IMPACT ANALYSIS RESULTS

Results are reported here only for Option 2, which has higher costs than Options 1 and 4. Option 3 results in no costs. Costs are reported in year 2002 dollars. Costs in the remainder of the Economic Analysis are reported in year 2000 dollars.

ES5.1 Costs per Acre

Cost per acre for Option 2 range, in the “low cost” (equivalent) states, from \$0 to \$340, depending on size of project and construction type. The highest cost per acre in the single-family

housing sector is \$259/acre. In the “high cost” (nonequivalent) states, costs range from \$0-\$921/acre. The highest cost per acre in the single-family housing sector is \$686/acre in nonequivalent states.

ES5.2 Impacts on Projects

Impacts on projects are calculated under a 100 percent cost passthrough assumption to measure impacts on consumers and under a zero cost passthrough assumption to measure impacts on industry profits. Under Option 2, the average percent change in project price from the buyer’s perspective, assuming all costs are passed through to the consumer, is at most 0.19 percent (in the single-family and industrial land use projects). The assumption of zero cost passthrough results in an estimated maximum decline in project profits of 1.67 percent in the single-family and industrial land use projects.

ES5.3 Impacts on Firms

The estimated number of firms expected to experience financial stress under Option 2 is estimated to total 258 firms (0.3 percent of all firms), assuming no costs can be passed through to consumers. Assuming a realistic cost passthrough, however, an estimated 31 firms (0 percent) are expected to experience financial stress. Depending on passthrough assumptions, a total of 673 to 5,178 employees (0.0 to 0.4 percent of all employees in the affected industries) might be affected at the financially stressed firms.

Compliance costs represent a maximum of 1.7 percent of the estimated assets at representative firms. Based on this finding, EPA concludes that Option 2 would not have produced any barriers to entry.

ES5.4 National Compliance Costs

The total national compliance costs of Option 2 in 2002 dollars is \$583.9 million. On a per-unit basis, this is \$112 per house and no more than \$0.04 per square foot in the other construction types under Option 2. These numbers do not show the share of costs split between consumers and industry, however.

ES5.5 Market Model Results

Using the Consumer Impact Model, EPA estimates that, under a realistic cost passthrough assumption, buyers will need an additional \$45 (2002 dollars) of income to qualify to purchase the median-priced new house under Option 2. Assuming income is fixed, this would result in a decline in the number of households that can afford the median-priced house of 0.09 percent.

Using the C&D/PEqMMS and market-based cost passthrough assumptions, EPA estimates that under Option 2, the price change of a single-family residence is \$65, resulting in a decline in number of houses produced annually of 157 units. This is a total loss of output to the construction industry of \$52.1 million.

EPA also uses the C&D/PEqMMS to determine impacts on regional markets. These markets are measured in terms of a rough housing opportunity index, which measures the percentage of households in a region that can afford the median-priced house in that region. Option 2 results in a maximum change in this percentage of 0.23 percent in the East North Central Region.

The C&D/PEqMMS is also used to compute price, quantity and output changes for the multifamily, commercial and industrial sectors. Option 2 results in a \$75 increase per multifamily unit, with 115 fewer units being built, for an overall output loss of \$15.8 million. Commercial space price rises by \$0.06 per square foot, resulting in 509 fewer project starts and an output loss of \$275.5 million. Industrial space price rises by \$0.08 per square foot, leading to 144 fewer project starts and an output loss of \$26.2 million.

ES5.6 Net Economic Impacts

Based on market modeling results discussed in the previous section, EPA computes the national-level changes in output and employment using an input-output modeling approach. For Option 2, EPA estimates that total output losses will be \$369.6 million (2002 dollars) and the net change in employment will be 2,552 jobs lost. Total deadweight losses to the economy associated with the changes in social

welfare (consumer welfare losses that are not transfers to producer welfare) are estimated to be approximately \$1 million under Option 2.

When broken down on a state basis, output losses range from \$0 among several states to \$31.5 million in Michigan. Only 14 states would have lost more than \$10 million in output under Option 2.

ES5.7 Impacts on Governments

EPA estimates that Option 2 would have resulted in an additional \$0.3 million cost to governmental units for establishing new permit requirements. Of the total aggregate costs of compliance, 24.7 percent, or \$144.2 million (2002 dollars), would have ultimately fallen on governments that undertake their own construction projects.

ES5.8 Additional Impacts

EPA's Final Action to not establish new regulations does not have any costs or benefits. However, since the regulatory options considered could be defined as a significant regulatory action under Executive Order 12866, EPA has provided a cost-benefit chapter to address the requirements of this Executive Order.

EPA estimates the Final Action will not disproportionately affect minority or low-income populations, nor will it have disproportionately high human health or environmental effects. It also will not have a significant effect on children's health. This finding would also have been true for Options 1, 2, and 4.

ES.6 FINAL REGULATORY FLEXIBILITY ANALYSIS

The final regulatory flexibility analysis (FRFA) requires several issues to be addressed: 1) the need for the regulation, 2) issues raised by public comments, 3) steps used to minimize impacts on small

entities, 4) an estimate of numbers and types of small entities affected, and 5) a description of reporting, record keeping, and other compliance requirements.

EPA is authorized to promulgate effluent guidelines and standards under the Clean Water Act. EPA can choose to regulate or not to regulate discharge of pollutants from the C&D industry pursuant to a consent decree in *NRDC et al. v. Reilly* (D.D.C. No. 8902980, January 31, 1992). As such, EPA is able to consider either promulgating effluent guidelines or determining that no action is necessary.

Significant issues raised in comment include concerns that the smallest firms would be greatly affected. EPA disagrees because none of the options considered will affect firms that disturb less than 5 acres of land. These firms tend to be the smallest firms in the affected industries. Some commenters believe that EPA did not present the SBREFA Panel conclusions and descriptions of outreach and that no impact results for small business were presented. EPA disagrees. The SBREFA Panel conclusions and descriptions of outreach are provided in the rulemaking record, and Section 6.4 of the EA for the proposal presents the small business impact analysis. A few commenters disagreed with EPA's use of housing starts cutoffs as a proxy for the number of acres disturbed to eliminate builders from the count of affected firms. EPA continues to believe these cutoffs are pertinent and has not systematically underestimated the numbers of small businesses affected. One commenter suggested EPA only consider sites greater than 5 acres. EPA's Final Action will not affect sites of any size.

EPA took several steps to minimize impacts in each of the options considered. Option 2 is designed to minimize impacts on small business by only covering sites where 5 acres of land or more are disturbed. By designing Option 2 to codify the CGP, EPA designed an option that is similar to the provisions in most states' regulations, leaving few firms potentially affected by incremental requirements. Option 4 further reduces impacts on small business by eliminating the inspection and certification requirements. Option 3, EPA's selected option, which continues the implementation of the existing NPDES regulations, imposes no incremental requirements on any firms.

EPA used SBA definitions of small firms and identified the number of small firms using distributions of numbers of establishments by revenue size classes, using the assumption that number of establishments are equivalent to numbers of firms based on ratios of numbers of establishments to firms in the key industries. Based on this approach, EPA estimates that 69,970 small firms would have been

potentially affected by either Option 2 or Option 4, of which only 18,554 are located in states considered to be nonequivalent states (that is, they will face the higher CGP codification cost components). This is only about 27 percent of all small firms that would have been potentially affected by either Option 2 or 4. The majority of these firms are in the commercial and institutional building construction industry (59 percent), with only 15 percent each in the single-family housing sector and heavy construction sector, 10 percent in the industrial construction sector, and 2 percent in the multifamily housing sector.

Option 2 contains record keeping and reporting requirements for entities in the C&D industry. The maintenance of a site log is a significant record keeping and reporting requirement. EPA estimates that maintaining site logs would have entailed 8.7 hours of labor annually at an average annual cost of \$335 for each firm. Some states would also have incurred some costs related to implementing Option 2 or 4. EPA estimates approximately 200 hours per state would be required to implement these options.

EPA also undertook an analysis of small business impacts. The analysis relies on the C&D/FrMS using a subset of the model firms that represent firms making fewer than 500 starts per year. EPA uses the standard revenue test methodology for identifying impacts on small firms and develops revenue distributions to allow for a range of revenues that might be possible at the modeled small firms. This approach provides EPA with low and high estimates of potential impact. The impacts are calculated based both on zero cost passthrough (the worst-case analysis) and market-based “realistic” cost passthrough. In the worst-case analysis, the maximum number of small firms with costs exceeding 1 percent of revenues under Option 2 is estimated to be 1,884, or 1.4 percent of all small firms. Under the realistic cost passthrough assumption, the maximum number of small firms with costs exceeding 1 percent of revenues is estimated to be 231, or 0.2 percent of all small firms.

ES.7 BENEFITS

EPA modeled stormwater discharges from construction sites to estimate the change in sediment reaching waterways as a result of implementing Option 4. EPA created separate models for each state, ecoregion, and soil type combination. The models indicated Option 4 would reduce sediment loads by 0.8 million metric tons each year. This change was input to National Water Pollution Control Assessment Model (NWPCAM), which is a national surface-water quality model that simulates water quality

improvements and economic benefits that result from water pollution control policies. NWPCAM incorporates a water quality model and monetary benefits estimation routine to conduct national policy simulations.

NWPCAM simulations indicated that total suspended sediment would be reduced in 9,303 stream miles as a result of Option 4. Total suspended sediment is one element of a six-parameter water quality index. EPA relates changes in the water quality index to household willingness to pay for changes in water quality derived from a 1993 survey by Carson and Mitchell. EPA estimates that the public would have been willing to pay \$15.2 million (2002 dollars) for the water quality changes that would have resulted from Option 4. An alternative analysis based on a water quality ladder interpretation of the Carson-Mitchell survey estimated a public willingness to pay of \$28.4 million.

In addition to the benefits estimated by NWPCAM, the regulation would have generated additional benefits that could not be easily quantified. EPA's Final Action does not generate any benefits or costs.

ES.8 COSTS AND BENEFITS OF THE REGULATORY OPTIONS

EPA is required under Executive Order 12866 to perform a cost-benefit analysis of a major rule, which is one in which costs to all parties exceed \$100 million per year. Because Options 2 or 4 might have costs exceeding \$100 million per year, EPA undertook a cost-benefit analysis. EPA first estimated the total social costs of the options by adding the total compliance costs to industry, the costs to government agencies and the deadweight losses to society. Option 2 is expected to result in total social costs of \$585.2 million per year. As discussed in Section ES.7, the total benefit of Option 2 is at least \$15.2 million per year. Option 4 results in total social costs of \$379.1 million per year and realizes benefits of \$15.2 million per year. Option 3, the no-action option, results in no costs and no benefits.

ES.9 UNFUNDED MANDATES REFORM ACT

EPA is required to determine impacts of federal mandates that might 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. The preceding analyses provide impact results on the private sector. EPA estimates impacts on governments here.

Had Option 2 or 4 been chosen, EPA estimates that governments would have incurred costs totaling \$144.2 million or \$93.4 million per year (2002 dollars), respectively. EPA compared local government share of compliance costs against several financial indicators to determine impacts on small governmental units (since they are the most sensitive to the costs imposed by the regulatory options). The indicators used were total revenues, capital outlay, and capital outlay for construction only. In all cases, compliance costs were less than 0.21 percent of any one of the financial measures, indicating no significant impacts on even the smallest governmental units from either Option 2 or 4.

CHAPTER ONE

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has considered four regulatory options to address stormwater discharges from active construction sites. For Option 1, EPA considered enhanced inspection and BMP certification requirements, with other permit requirements based on BPJ, for sites where one acre of land or more is disturbed. For Option 2, EPA considered technology-based effluent limitation guidelines and standards (ELGs) for stormwater discharges from construction sites where 5 acres or more of land are disturbed. This option also included enhanced inspection requirements and certification of Best Management Practices (BMPs). As another option (Option 3), rather than establishing ELGs, EPA considered allowing technology-based permit requirements to rely on the existing National Pollution Stormwater Discharge Elimination System (NPDES). This is referred to as EPA's no-action option. As a last option (Option 4), EPA considered the Option 2 ELGs, but eliminated the enhanced inspection and BMP certification requirements.

The deposition of sediment discharged from construction sites contributes to the loss of capacity in small streams, lakes, and reservoirs. Mitigation efforts are required to repair loss of stream capacity and include dredging or replacement. The options requiring establishment of ELGs or inspection and certification procedures could significantly reduce the amount of sediment discharged from active construction sites. The Preamble to the Final Action discusses EPA's decision among instituting an ELG covering construction and development activities, requiring inspection and certification procedures, and allowing permits based on BPJ. This report provides the economic information EPA used to make the decision on which action to undertake.

This EA presents EPA's analysis of the incremental compliance costs and the economic impacts of the final options. The EA details the options that the Agency considered for the Final Action. The report covers financial impacts to establishments in the construction and development (C&D) industry, potential impacts on consumers, and market and secondary impacts on the national economy, such as employment and output. The EA also presents small business analyses to comply with the Regulatory

Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). It includes cost-benefit analyses required under Executive Order 12866 and the Unfunded Mandates Reform Act (UMRA). Additionally, the EA presents information on environmental justice and children's health.

This chapter begins with a discussion of the current regulatory environment in the C&D industry. Section 1.1 provides background useful for understanding the regulatory baseline for the C&D economic analysis. To determine the baseline, EPA assumed 100 percent compliance with the Phase I and Phase II stormwater requirements and applicable state regulations. EPA also used the Development Document for the Effluent Guidelines for the Construction and Development Point Source Category (Technical Development Document) (U.S. EPA, 2004a) to identify states that have requirements equivalent to EPA's regulatory options.

Chapter One includes five additional sections. Section 1.2 presents EPA's reasons for considering the ELG and the inspection and certification provisions, as well as the "no-rule" option for the final decision. Section 1.3 identifies the potentially affected sectors of the C&D industry. Section 1.4 provides an overview of key data sources used in the development of this EA. Section 1.5 discusses some of the major comments received on the EA for the proposal, and Section 1.6 provides an outline for the remainder of this report.

1.1 EXISTING REGULATORY FRAMEWORK

The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), was passed by Congress in 1972 to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" (33 U.S.C. § 1251 (a)), sometimes referred to as "fishable, swimmable" criteria. The CWA establishes a comprehensive program for protecting our nation's waters. Among its core provisions, the CWA prohibits discharging pollutants from a point source to waters of the United States without a NPDES permit. Under Title III, the CWA also provides for the development of technology-based effluent limitations that are imposed through the NPDES permit framework to control direct discharges of pollutants.

The CWA was amended in 1987 to provide for implementation of a comprehensive national program for addressing municipal and industrial stormwater discharges (Water Quality Act of 1987, Pub. L. 100-4, February 4, 1987). Section 402(p) of the CWA requires that industrial, municipal, and other stormwater dischargers designated by EPA obtain NPDES permits. In response to these amendments, EPA has promulgated two rules that contain provisions affecting the C&D industry. These regulations, commonly referred to as the Phase I (55 FR 47990) and Phase II (64 FR 68722) stormwater rules, require NPDES permits for construction activities disturbing more than 1 acre and discharging stormwater. Phase I was promulgated on November 16, 1990, with permit requirements taking effect in 1992. Phase II was promulgated on December 22, 1999, with permit requirements taking effect in March 2003.

The C&D industry is currently regulated under NPDES permit requirements for construction activities disturbing more than 1 acre. Construction activities disturbing 5 acres or more are covered under the Phase I requirements while construction activities disturbing between 1 acre and 5 acres are covered under the Phase II requirements. Phase II requirements took effect on March 10, 2003.

The Phase II requirements for the C&D industry are implemented through the NPDES program. The implementation tool is either EPA's Construction General Permit (CGP) in states without their own authorized NPDES program or a permit issued by a state that is authorized as a NPDES permit administrator. The national CGP issued by EPA applies in those areas where EPA Regions 1, 2, 3, 5, 6, 7, 8, 9 and 10 are the NPDES permitting authorities. (The CGP recently became available in EPA Region 6.) EPA Region 4 has their own version of the CGP, which applies only in those areas where the respective Region is the NPDES permitting authority. Permits required by NPDES programs can also be issued through one of EPA's ten regions (as described above) or through an authorized state/territory NPDES permitting authority. At this time, 44 states have NPDES permitting authority.² EPA also issues stormwater permits in nondelegated states, on tribal lands, and in most territories.

² With the exception of Alaska, Arizona, the District of Columbia, Idaho, Massachusetts, New Hampshire, and New Mexico, all states have some level of NPDES permitting authority. Even in states with NPDES permitting authority, EPA could be responsible for issuing permits for activities conducted at federal facilities and/or on tribal lands.

EPA's CGP was initially issued in 1992 to cover the Phase I requirements and, because permits must be renewed every five years, was renewed in 1998. These permits covered only construction activities on sites larger than 5 acres. The 1998 permit was renewed in July 2003. This revision of the CGP incorporates the small construction activity permitting requirements of the Phase II rule, which covers sites from 1 to 5 acres. It requires permittees (including the newly affected builders and developers of the smaller Phase II sites) to prepare a stormwater pollution prevention plan (SWPPP) for C&D activities. The permit lists options and goals for other erosion and sediment controls (ESCs), and the SWPPP must contain a description of any ESCs used, but there are no *required* elements.³ Options and goals for post-construction BMPs are also contained in the CGP, but none are specifically required. As with ESCs, those BMPs selected for use, if any, must be described in the SWPPP. The new CGP also continues to apply to the original Phase I activities (those disturbing 5 acres of land or more). The national CGP and the general permits currently used by NPDES permitting authorities are intended to be used as templates for the small construction permits.

The Phase II regulations also provide waivers for construction activities disturbing between 1 and 5 acres of land in instances where:

- Activity occurs during a negligible rainfall period (rainfall erosivity factor of less than five), or
- A Total Maximum Daily Load (TMDL) or equivalent analysis addresses the pollutants of concern, leading to a determination that stormwater controls are not necessary for construction activity. (64 FR 68735).

These waivers acknowledge that variance in regional factors, such as climate, annual rainfall patterns, and existing hydrology, affect the incidence and magnitude of stormwater runoff.

EPA has encountered some difficulties in implementing Phase II. First, one portion of the rule was remanded. The remanded portion applies to municipal separate storm sewer systems (MS4s), but not to construction. Additionally, EPA has postponed the permit application date for oil and gas

³ For sites with 10 acres or more of disturbed area, the CGP does require installation of temporary sediment basins.

construction activity that disturbs 1 to 5 acres (i.e., sites covered under the Phase II rule) until March 10, 2005. All other provisions of the Phase II requirements have been implemented under the current CGP. This fact leads to EPA's baseline assumption that Phase II, as it applies to the C&D activities applicable to the regulatory options under consideration, is fully in effect.

1.2 PURPOSE OF THE REGULATORY OPTIONS

The existing NPDES stormwater regulations require construction site operators to manage construction site runoff, but do not require any specific level of control. Two of the options under consideration (Options 2 and 4) are designed to establish ELGs in the form of minimum standards for design and implementation of erosion and sediment controls used during the active phase of construction.

Existing compliance determination practices for construction site stormwater controls rely principally on site inspections by local governments. Enforcement efforts are reported to be uneven nationwide, largely due to limited enforcement resources at the federal, state and local levels. Option 1 is designed to establish site inspection and certification requirements, but without the ESC standards. Option 2 (but not Option 4) also establishes minimum requirements for conducting site inspections and providing certification as to the design and completion of various aspects of those controls. These requirements could strengthen the current permit program.

1.3 INDUSTRIES POTENTIALLY AFFECTED BY THE REGULATORY OPTIONS

This report focuses on the major C&D industries potentially affected by the options considered by EPA. Table 1-1 identifies these industries according to both their North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC) codes.⁴ A detailed description of these C&D industries can be found in Chapter Two of this report.

⁴ The NAICS system recently replaced the SIC system.

Table 1-1. Industries Potentially Affected by the Regulatory Options

Regulated Entities	North American Industry Classification System Code (NAICS)	Standard Industrial Classification Codes (SIC)^a
Land subdivision and development	23311	6552
Single-family housing construction	23321	1521, 1531, 8741
Multifamily housing construction	23322	1522, 1531, 8741
Manufacturing and industrial building construction	23331	1531, 1541, 8741
Commercial and institutional building construction	23332	1522, 1531, 1541, 1542, 8741
Highway and street construction	23411	1611, 8741
Bridge and tunnel construction	23412	1622, 8741
Water, sewer, and pipeline construction	23491	1623, 8741
Power and communication transmission line construction	23492	1623, 8741
Excavation contractors	23593	1794
Wrecking and demolition contractors	23594	1795

^a Some parts of the SIC Industries are included in other NAICs industry classifications.
 Source: U.S. Census Bureau 1997 Census of Construction

1.4 OVERVIEW OF KEY DATA SOURCES

A common data source used to support the development of many past ELGs is the CWA section 308 industry survey. For this rulemaking process, however, EPA determined that such a survey should not be undertaken. This decision led to the use of existing data sources, including academic literature, industry trade associations, and government data, such as that provided by the U.S. Census Bureau. Major data sources are discussed in more detail where they are used to support sections of this analysis. This section provides an overview of several key sources and their importance to the economic analysis of the proposed C&D ELG.

Of primary importance in the development of this EA were the 1992 and 1997 results of the Census of Construction, conducted by the U.S. Census Bureau every five years. The census provided information on the industry sectors potentially affected by the proposed rule, as well as characteristics of each sector, such as employment and revenue levels. Questionnaires for the 2002 Census of Construction were mailed in December 2002. Responses were due by February 12, 2003, but many extensions of time to file were granted. Once they are received, responses are coded and checked before the data are released. The Census Bureau will not release data until they are thoroughly reviewed and consistent. The Bureau has not yet scheduled a date for release of Census of Construction data but expects to release information in 2004 and 2005. EPA does not have access to the new census data for this EA.

EPA used several other reports from the Census Bureau that are updated more frequently than the Census of Construction, including:⁵

- Report C20 – Housing Starts
- Report C25 – Characteristics of New Housing
- Report C30 – Value Put in Place
- Report C40 – Building Permits

All of these reports contributed to the various economic models developed for this EA.

The U.S. Department of Agriculture's (USDA's) Natural Resources Inventory (NRI) was used to determine the amount of disturbed acreage caused by urbanization and new development. This information was important to the environmental assessment, the benefits assessment, and as a way to determine the rate of new development.

EPA also used data collected from permits issued by existing NPDES permitting authorities. Currently, regulation of C&D activity is triggered when a builder/developer files a notice of intent (NOI) with the permitting authority. Permitting authorities record these NOIs in order to track development

⁵ These reports are available at the following web address: <http://www.census.gov/const/www/>.

within their jurisdiction. EPA obtained copies of NOI databases for NPDES-approved states and for those non-authorized states where EPA acts as the NPDES permitting authority.⁶ The databases contained a wide variety of information, such as total site size, disturbed acreage, project type (e.g., residential, nonresidential), and project ownership status (public or private). EPA planned to use this information to estimate the number of stormwater starts. The databases, however, lacked the level of detail EPA wanted to generate reliable estimates. In addition, inconsistencies in the type of data collected and coverage made it difficult to compare the databases with one another. Although EPA could not use these databases in the manner hoped, they were useful for generating rough estimates of the number of permits issued nationwide, as a check on the permit estimates reported by the Census Bureau. EPA did not conduct further analysis on these databases prior to a final decision on the action concerning a C&D ELG.

An additional source of information for the development of the economic analysis (described in Section 4.2) was a series of focus groups held with representatives of the National Association of Home Builders (NAHB). These focus groups helped EPA understand the process of construction project development and provided estimates of data elements most helpful in building economic models. These estimates were used when no other national-level data from other sources (such as the Census Bureau) were available. EPA continues to rely on some of these data where no alternative data are available.

Some of the data and methodologies used in the Phase II EA were also used in this rulemaking effort. These sources and methods are described in detail in Chapters Four, Five, and Six.

EPA received several comments on the sources of data used in the EA. Two comments were of special note. First, the Multi Housing Council and the National Apartment Council commented on EPA's solicitation of data on the financial conditions of multifamily builders and developers. They provided alternative assumptions about the length of time to complete a project and financing (i.e., whether these projects are financed separately from related projects by the same firms). EPA reviewed the information provided and found it valid for use in modeling multifamily projects. Chapter Four discusses these changes in more detail. Second, NAHB had similar issues with EPA's assumptions about single-family projects, stating that they are of longer duration and are rarely cross-subsidized by other ongoing projects

⁶ NPDES permits are fully administered by EPA in six states plus Washington, DC. In other states, EPA acts as the permitting authority for activities only on Indian and/or federal lands.

in the same firm. NAHB also questioned the validity of the focus group data. EPA reviewed the data that NAHB collected and their data collection techniques. Although the survey response rate was extremely low (less than 20 percent) and other aspects of the survey design could not be assessed, EPA has adopted some of the results in its analysis. More information can be found in Chapter Four.

Note that other key comments on the economic analysis are discussed where they are relevant in the report, along with summaries of EPA's responses. The complete comments with EPA's responses can be found in the Summary of Public Comments with Responses Based on the Proposed Effluent Limitations Guidelines for Construction and Development (U.S. EPA, 2004b) (Response to Comments Document).

1.5 MAJOR COMMENTS ON THE ECONOMIC ANALYSIS FOR THE PROPOSAL

EPA received numerous comments on the proposal, some of which pertain to the economic and/or the benefit-cost analyses. Some of the more significant comments, either due to the number of comments received or their impact on EPA's decision to modify certain analyses for the final action, are discussed below. Other comments that indirectly relate to the economic analysis, such as comments on EPA's cost analysis and comments on individual benefits categories, are not considered direct comments on EPA's economic analysis. Comments in these areas can be found in EPA's Response to Comments Document. For the most part, those comments not summarized here are discussed as they become relevant to the discussion in this EA. Detailed responses to all economics comments, including the ones summarized below, can be found in EPA's Response to Comments Document.

Many of the commenters on the economic analysis were concerned that the economic impacts on the industry, consumers, or the housing market itself would be too high if Options 1 or 2 were selected. EPA acknowledges that Options 1 or 2 could result in some impacts, but does not judge the economic achievability of these options in this report. See the Response to Comments Document.

Many commenters were concerned that EPA was proposing options (Options 1 and 2) that had a low benefit-cost ratio and felt EPA should not promulgate a rule where the costs outweighed the benefits to such an extent. EPA notes that the CWA does not require EPA to consider a strict comparison of the costs and benefits of an effluent guideline. Although EPA does consider the costs and benefits of the options in deciding which action to take, it does not solely rely on cost/benefit ratios in choosing an option for the Final Action. See EPA's Federal Register Notice for EPA's choice of option for the Final Action and reasoning behind that choice. EPA also notes, however, that costs are relatively easy to quantify, while benefits can be very difficult to quantify, and it may be even more difficult to assign a dollar value to them. The Agency continues to work on developing methodologies that could allow more accurate quantification of benefits in future rulemakings.

A few commenters were concerned that EPA had ignored a large segment of small operations—those constructing one to four houses per year, or those primarily involved with remodeling. EPA emphasizes that those building one to four houses per year or those primarily involved with remodeling are unlikely to *disturb* an acre of land or more. Some commenters seemed confused by the difference between total land developed and disturbed acreage. The disturbed acreage will generally be much less than the total acreage developed. Those who build one to four houses per year generally build one house at a time and often on nonadjacent lots. Even if they build four houses as part of one development, the construction of four houses is unlikely to disturb an entire acre. This is also true of firms primarily in the remodeling industry. EPA continues to believe that the assumption that remodeling operations and those constructing one to four houses per year will not disturb 1 acre of land or more at any one time is a valid one for the economic analyses.

Additionally, one commenter noted that EPA's analysis did not include firms with no employees. These firms do all of their construction work through subcontractors. The commenter pointed out that EPA's analysis does not account for impacts on subcontractors. EPA agrees that firms without employees could trigger compliance costs. Unfortunately, there are very little data available to characterize the impact of the regulation on such firms. EPA's analysis shows that, generally, these firms are very small, and their revenues generally fall in a range that is unlikely to be associated with the amount of work that would result in the disturbance of an acre or more of land. A few such firms, however, might have revenues in the ranges typically seen for firms that EPA does consider affected. Such firms could be characterized by the volume of business they do rather than their number of employees and, therefore,

might resemble firms EPA has analyzed. EPA assumes firms with no employees, doing a similar amount of business (measured as revenues) as those modeled in the analysis, will exhibit similar impacts and the percentage of firm impacts will not change.

Impacts on subcontractors were also raised as an issue by the same commenter. EPA believes that most additional costs to the subcontractor would be passed to the developer (since all potential subcontractors will take into account the additional work needed to meet requirements and submit bids reflecting this additional work). Even if this assumption is not true, costs would be shared between several subcontractors, limiting impacts further.

The same commenter was concerned that, because firms with no employees were not included in the count of firms, EPA had underestimated costs of compliance. EPA did not use a count of firms to estimate costs. Costs were estimated by multiplying the costs of compliance on a per-acre basis by the number of estimated acres disturbed in each type of construction activity (single family, multifamily, commercial, and industrial).

EPA received substantial, detailed comments from NAHB. A key source of confusion was the fact that numbers appearing in Chapter Four of the proposal EA were only examples to demonstrate how the methodology worked, rather than actual results. Tables in Chapter Five show the numbers used in the models to produce the actual reported results. Additional points of confusion are addressed in the Response to Comments Document. EPA has made substantial efforts to identify portions of the EA that NAHB found confusing and to ensure that these portions are clearer to the uninitiated reader. Chapter Four now clearly identifies which numbers are being used as examples only and indicates that similar numbers in Chapter Five are the actual numbers used in the analysis to produce the results seen. Additionally, EPA has substantially rewritten both Chapters Four and Five to make them clearer to the uninitiated reader.

As noted in Section 1.4, NAHB, the National Multi Housing Council, and the National Apartment Association commented on certain specific methodological issues and provided alternative data to replace assumptions on duration of projects, timing of expenditures (believing certain expenditures should be assumed to occur in the first year), and financial independence of individual projects from other projects a firm could have underway. EPA reviewed the information and, although it

had some reservations, concluded that the information provided or referenced by the associations provided valid assumptions for the modeling. Thus, EPA now considers single-family and multifamily projects to be independent projects (not cross-subsidized by other projects) and has set the duration of single-family projects to four years and multifamily projects to nine years. EPA, however, has not changed timing assumptions. As it did at proposal, EPA assumes that all costs are incurred in the first year of a project. This assumption tends to overstate costs to the extent that costs are incurred later in a project, but only to a very small degree (see Chapter Four).

NAHB commented that the data derived from the focus groups was anecdotal and suggested that EPA should have done a survey. EPA agrees that the data is anecdotal, but some of these focus group data are now augmented by data submitted by NAHB. The remaining data, although anecdotal, is still the only information available. Furthermore, the focus groups were attended by many of NAHB's own members, who are highly respected for their knowledge of the industry and who have every motivation to provide reasonable, if not fairly conservative, assumptions about their industry. NAHB was also concerned by EPA's use of a 14-community study to determine the portion of land disturbed, saying the sample was too small to provide useful data. The commenter did not, however, provide alternative data. EPA did not perform a section 308 survey, which would have been the only alternative to using the focus group and 14-community data. EPA, however, balances the burden to respondents with the additional benefits of more precise data. Many effluent guidelines in the past have forgone section 308 surveys and have been supported by similar types of information from focus groups and/or trade associations. In addition, many analyses have relied on assistance from these types of groups in the development of model facilities. EPA must sometimes rely on less than ideal data for decisionmaking purposes. EPA has done the best job it could with less than perfect data and has followed a reasonable approach in the use of that data.

EPA received numerous comments on the elimination of post-construction requirements, both for and against. Those against dropping the post-construction requirements suggest that EPA found them economically achievable and that the benefits significantly outweighed the costs. EPA reiterates that the Agency never proposed controls on post-construction discharges and did not seek comment on such measures. EPA discusses the reasons for the elimination of post-construction requirements in the Preamble to the proposal.

NAHB seemed confused by the purpose of EPA's various cost passthrough analyses. The organization did not seem to understand that the zero cost passthrough and the 100 percent cost passthrough analyses are alternative bounding analyses. NAHB was concerned that EPA had ignored impacts on consumers in the zero cost passthrough analysis and ignored industry in the 100 percent cost passthrough analysis. The analysis that EPA uses to assess the impacts on both industry and consumers simultaneously is the market analysis, which predicts a high proportion of cost passthrough, but not 100 percent. The other two analyses were undertaken only to determine the maximum possible impact on industry and consumers separately. EPA received no other comments on the ability of the C&D industry to pass through a large portion of costs or that raised issues with EPA's use of three cost passthrough assumptions (zero, 100 percent, and a market-based percentage).

One commenter thought EPA should clarify the baseline from which impacts are measured. EPA has provided a discussion of the baseline assumptions in Section 1.2 and Chapter Four, Section 4.1.1.

One commenter noted that EPA did not evaluate oil and gas projects and, therefore, did not determine if the proposed regulation is economically achievable for this industry. EPA's Final Action will not affect oil and gas projects.

1.6 REPORT ORGANIZATION

This EA report is organized as follows:

- **Chapter Two** contains the Industry Profile, which provides background information on the establishments and industry sectors potentially affected by the proposed rule.
- **Chapter Three** summarizes and discusses the options EPA considered in this decisionmaking process.
- **Chapter Four**, Economic Impact Analysis Methodology, explores the data, methodology, and analyses used in the determination of project, firm, and market-level impacts due to incremental stormwater control costs incurred under each of the options considered.

- **Chapter Five** presents the impacts of the options considered on the project level, firm level, and national and regional levels. This chapter also includes a discussion of other potential impacts of the options considered according to Executive Order 12866, including regional and social impacts.
- **Chapter Six** contains information for use in the Final Regulatory Flexibility Analysis (FRFA) and the small business analysis under the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).
- **Chapter Seven** summarizes the methodology and results of EPA's benefits analysis, which is presented in the Technical Development Document.
- **Chapter Eight** looks at the costs and benefits of the options considered for the Final Action using the benefits assessment described in Chapter Seven. Here, EPA presents an assessment of the nationwide costs and benefits of the options considered pursuant to Executive Order 12866 and the Unfunded Mandates Reform Act (UMRA).
- **Chapter Nine** presents a discussion of the results of analyses pertaining to additional UMRA requirements.

1.7 REFERENCES

U.S. EPA, 2004a. Development Document for the Effluent Guidelines for the Construction and Development Point Source Category. Washington, DC: U.S. Environmental Protection Agency, EPA-821-B-04-001.

U.S. EPA, 2004b. Summary of Public Comments with Responses Based on the Proposed Effluent Limitations Guidelines for Construction and Development. Washington, DC: U.S. Environmental Protection Agency.

CHAPTER TWO

PROFILE OF THE CONSTRUCTION & DEVELOPMENT INDUSTRY

2.1 INTRODUCTION

The C&D industry plays an integral role in the nation's economy, contributing approximately five percent of the Gross Domestic Product (GDP). Establishments in this industry are involved in a wide variety of activities, including land development and subdivision, homebuilding, construction of nonresidential buildings and other structures, heavy construction work (including roadways and bridges). Establishments are also involved in a myriad of special trades, such as plumbing, roofing, electrical, excavation, and demolition work. Some of these activities result in land disturbances that can cause erosion and the transport of soil and sediment in stormwater runoff (U.S. EPA, 2001). EPA's Options 1, 2, and 4 for the C&D industry seek to reduce the environmental and economic effects of stormwater runoff from construction sites (Option 3 is the no-action alternative). See Chapter Three for more information on the options EPA considered. EPA's decision for the Final Action is discussed in the Preamble to that action.

Several characteristics of the C&D industry affect the structure of this economic analysis:

- Individuals (e.g., homebuyers) are often the direct customers of the C&D industry. With individuals as the direct consumer, it is helpful to address issues such as cost passthrough and the impacts of regulations on housing affordability.
- There are complex and varying relationships between developers and builders, resulting in a variety of different business models. Developers may undertake all site improvements and sell completed lots directly to builders, act as builders themselves and remain onsite to build out the development, or some combination of the two.
- The C&D industry is dominated by small businesses. EPA has, therefore, carefully considered the impacts on small businesses in accordance with SBREFA.
- C&D activities are highly localized. This suggests that a regional approach to analysis is helpful in order to account for varying market conditions.

- According to standard definitions, the industry includes a large number of establishments primarily engaged in remodeling activities and special trades (e.g., plumbing, electrical). These establishments are less likely to be involved in land disturbing activities.

The C&D industry, as defined for this rule, is comprised of four main industry groups.

- Land development and subdivision
- Residential construction (including single-family and multifamily construction)
- Nonresidential construction (including commercial and industrial construction)
- Heavy construction

These four industry groups encompass those parts of the industry most likely to engage in land disturbing activities and further affect the structure of this analysis. EPA is concerned with stormwater runoff from construction sites, which carries increased sediment loads (and potentially increased loads of metals and nutrients) into receiving waters, impairing the functioning of those waters (U.S. EPA, 2001).

2.1.1 Recent Trends in the C&D Industry

Table 2-1 presents the number of C&D establishments in 1992, 1997, and 2000. Data for the years 1992 and 1997 are from the Economic Census, whereas 2000 data are from the U.S. Census Bureau's County Business Patterns. The 2002 Economic Census data were not available when this report was published. Between 1992 and 1997, the number of C&D industry establishments with payroll increased 11.0 percent, from 235,789 to 261,617. Between 1997 and 2000, the number of establishments with payroll increased another 8.8 percent to 284,627 (see Table 2-1). This modest increase masks some significant offsetting changes in establishment counts among groups within the industry as defined by the North American Industry Classification System¹ (NAICS):²

¹ This profile refers to the 1997 NAICS classification. Construction-related NAICS codes were revised in 2002. As our primary data source, the 1997 Census of Construction, has not been restated in the new classification, so we continue to use the 1997 NAICS system. Appendix 2-A at the end of Chapter Two provides a cross-walk to the 2002 NAICS classification.

² The Census Bureau classifies industries according to the NAICS. Under the NAICS, economic activity is first divided into twenty broad two-digit industry codes. One of these is Construction (NAICS 23). Each two-digit industry is further subdivided into three-, four-, and five-digit level industries.

- The number of establishments in the land development industry group (NAICS 2331) *decreased* by 46.6 percent between 1992 and 1997 and *increased* by 60.2 percent between 1997 and 2000.
- Between 1992 and 1997, there was a 13.5 percent *increase* in the number of establishments in residential and nonresidential construction (NAICS 233, except 2331). The number of establishments *increased* by another 6.4 percent between 1997 and 2000.
- While the number of establishments in heavy construction *increased* by 14.5 percent between 1992 and 1997, the number *decreased* by 7.1 percent from 1997 to 2000.
- There was a 33.0 percent *increase* in the number of special trades contractor establishments (NAICS 235) between 1992 and 1997, including a 31.2 percent increase among excavation contractors and a 59.6 percent increase among demolition contractors. Between 1997 and 2000, the number of establishments engaged in special trades contracting *increased* by another 45.5 percent. During this time period, establishments specializing in excavation contracting increased by 48.1 percent while those in demolition contracting increased by 13.7 percent.

Table 2-1. Number of Establishments in the C&D Industry, 1992 and 1997 Economic Census Data and 2000 County Business Patterns Data

NAICS	Description	1992	1997	2000	Percent Change 1992-1997	Percent Change 1997-2000
233, except 2331 ^a	Building, developing, and general contracting, except land development and subdevelopment	168,407	191,101	203,243	13.5%	6.4%
2331	Land development and subdevelopment	15,338	8,185	13,111	-46.6%	60.2%
234	Heavy construction	37,180	42,557	39,516	14.5%	-7.1%
235 ^b	Special trade contracting	14,864	19,771	28,757	33.0%	45.5%
TOTAL		235,789	261,617	284,627	11.0%	8.8%

^a Includes both residential and nonresidential construction.

^b Includes NAICS 23593 (Excavation contractors) and 23594 (Wrecking and demolition contractors) only.

Figures do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2000), U.S. Census Bureau (2003a).

2.1.2 Data Sources Used

Several data sources are used in this profile chapter to characterize the C&D industry. The primary data source is the 1997 Census of Construction (herein referred to as the census), conducted

every five years by the U.S. Census Bureau³. A second data source comes from the U.S. Small Business Administration (SBA). The SBA data is used because it provides firm-level data that is useful for economic modeling purposes and for the small entity analysis (the census data is reported at the level of the construction establishment, not the firm). Table 2-2 compares the census data with that from SBA in order to further clarify the differences and identify how each are used in this EA. The majority of this chapter uses data from the 1997 Census to profile the C&D industry, since that source provides a greater level of detail on industry characteristics.

Table 2-2. Comparison of Major Data Sources

Characteristic	Data Source	
	Census of Construction	SBA
Level of Detail	Establishment ^a	Firm ^b (company) and establishment
Source of Data	Survey (sent to approximately 130,000 establishments from a universe of 650,000)	County Business Patterns SUSB report, which ultimately relies on administrative records data
How the Data are Applied in this Analysis	Industry-level analysis to determine the number of potentially affected establishments	Firm-level analysis, for purposes of determining the number of potentially affected firms considered “small” by SBA size standards

^a The Census Bureau defines an establishment as “a relatively permanent office or other place of business where the usual business activities related to construction are conducted” (U.S. Census Bureau, 2000).

^b A firm is considered to be an aggregation of the establishments owned by a single company; therefore, one firm could comprise several establishments.

The 2002 Census of Construction was fielded in December 2002. Completed questionnaires were due in February 2003. Many respondents requested and received extensions of the filing deadline. With data entry, follow-up, consistency checks, and summarization, results are not expected to be released until 2004 and 2005. The new census will provide improved data for analyses such as this one. It will be based on the 2002 NAICS classification, which distinguishes builders of new construction from remodelers and offers more detailed classification of building trades. A special section was added to the census to explore joint venture relationships, which commenters on the proposed rule have cited as a

³ The 2002 Census is not available.

significant form of business organization. The 2002 Census data, unfortunately, are not available for this analysis.

2.1.3 Organization of this Chapter

The purpose of this profile is to provide an overview of the C&D industry, describe its key characteristics and structure, and analyze current and historical trends. Section 2.2 describes the process that EPA used to identify and define the industry for the purposes of the proposed rule and Final Action. Section 2.3 presents characteristics of the C&D industry, including both industry and firm-level data. Section 2.4 covers industry growth and trends, and Section 2.5 briefly examines international competition in the C&D industry. Detailed discussions on market supply and demand factors in the C&D industry, economic and financial characteristics of the industry, and key business indicators and ratios can be found in the Economic Analysis of the proposed rule (U.S. EPA, 2002).

2.2 INDUSTRY DEFINITION

2.2.1 Basis for Regulation

The Final Action will potentially affect establishments within the construction sector (NAICS 23) that disturb the land at construction sites of 1 acre or more or 5 acres or more, depending on the option selected for the Final Action. These land-disturbing activities can include site preparation and site clearing tasks, such as tree removal, excavation, blasting, scraping, and grading, and are generally accomplished with the aid of heavy equipment, such as skidders, bulldozers, backhoes, excavators, and graders. These activities can destabilize soils and create conditions that allow stormwater to accumulate and flow across the site. This increase in stormwater flow can cause erosion and lead to the transport of soil particles and attached pollutants, which eventually can be conveyed offsite and discharged into receiving waters. Both the increased flow and associated pollutant and sediment loads that result from land-disturbing activities can negatively impact the biological, physical, and chemical characteristics of the receiving waters.

Options 1, 2, and 4 build on the Phase I and Phase II stormwater regulations promulgated under the National Pollutant Discharge Elimination System (NPDES), as well as on EPA's stormwater construction general permit (CGP). The CGP is the vehicle through which Phase I and Phase II regulations are being implemented. Where EPA is the permitting authority. See Chapter One for more details on the CGP. As with the proposed rule, Options 1, 2 and 4 also build on current state and local stormwater control requirements by adding increased specificity and consistency to them. See Chapter Three for more information on the options EPA considered. The methodology chapter (Chapter Four) provides further detail on how the options are designed to be implemented.

2.2.2 Industry Definition

For the purposes of this economic analysis, the "C&D industry" is assumed to include those establishments within the construction sector (NAICS 23) that could be involved in activities that disturb the ground at construction sites. This includes site clearing or site preparation activities, such as tree removal, excavation, blasting, scraping, grading, etc. EPA believes that many establishments in NAICS 233 (building, developing, and general contracting) and NAICS 234 (heavy construction) are likely to engage in such activities on a regular basis. Establishments within selected five-digit industries that are part of NAICS 235 (special trade contractors) could also engage in land-disturbing activities. The latter could include NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors). The remainder of the special trades industry is considered unlikely to engage in such activities. Table 2-3 identifies the industry groups that could be covered by the Final Action.

As seen in Table 2-3, each NAICS industry is comprised of one or more industry groups defined under the former Standard Industrial Classification (SIC) system. With the 1997 Census, the Census Bureau switched from reporting data on a SIC basis to a NAICS basis, thereby making it difficult to compare data from 1997 with that from the 1992 and earlier census reporting periods. Within this economic profile, the objective is to provide data at the most detailed level as possible, while still maintaining the ability to provide meaningful comparisons between 1997 and earlier census periods. With this goal in mind, EPA made further adjustments to the groups of affected industry groups later in this chapter and in Chapter Four to correspond to assessments of the likelihood that the industry groups will disturb land or that they will disturb only small sites and, thus, meet the site size exclusions reflected

Table 2-3. Industry Definitions for C&D Industry Profile

1997 NAICS Code	Description	Relevant SIC Codes ^a
233	Building, developing, and general contracting	
2331	Land subdivision and development	
23311	Land subdivision and development	6552 Land subdividers and developers, except cemeteries
2332	Residential building construction	
23321	Single-family housing construction	1521 General contractors–single-family houses 1531 Operative builders (partial) 8741 Management services (partial)
23322	Multifamily housing construction	1522 General contractors–residential buildings other than single-family (partial) 1531 Operative builders (partial) 8741 Management services (partial)
2333	Nonresidential building construction	
23331	Manufacturing and industrial building construction	1531 Operative builders (partial) 1541 General contractors–industrial buildings and warehouses (partial) 8741 Management services (partial)
23332	Commercial and institutional building construction	1522 General contractors–residential buildings, other than single-family (partial) 1531 Operative builders (partial) 1541 General contractors–industrial buildings and warehouses (partial) 1542 General contractors–nonresidential buildings except industrial buildings and warehouses 8741 Management services (partial)
234	Heavy Construction	
2341	Highway, street, bridge, and tunnel construction	
23411	Highway and street construction	1611 Highway and street construction contractors, except elevated highways 8741 Management services (partial)
23412	Bridge and tunnel construction	1622 Bridge, tunnel, and elevated highway construction
2349	Other heavy construction	
23491	Water, sewer, and pipeline construction	1623 Water, sewer, pipeline, and communications and power line construction (partial) 8741 Management services (partial)
23492	Power and communication transmission line construction	1623 Water, sewer, pipeline, and communications and power line construction (partial) 8741 Management services (partial)
23493	Industrial nonbuilding structure construction	1629 Heavy construction, n.e.c. (partial) 8741 Management services (partial)
23499	All other heavy construction	1629 Heavy construction, n.e.c. (partial) 7353 Heavy construction equipment rental and leasing (partial) 8741 Management services (partial)
235	Special trade contractors	
23593	Excavation contractors	1794 Excavation work special trade contractors
23594	Wrecking and demolition contractors	1795 Wrecking and demolition work special trade contractors

^a NAICS replaced the SIC (Standard Industrial Classification) System.
Source: U.S. Census Bureau (2000).

in the regulatory options. The statistical tables contained in this profile reflect these adjustments.⁴ Certain categories are also excluded later in this EA based on qualitative assessments that they are unlikely to bear the ultimate impact of the regulatory options.

The NAICS covered in this EA include:

- NAICS 233, except 2331—Building, developing, and general contracting, except land subdivision and land development
- NAICS 2331—Land subdivision and land development
- NAICS 234—Heavy construction (when possible, covered industries are only to include NAICS 23593 [excavation contractors] and NAICS 23594 [wrecking and demolition contractors].)
- NAICS 235—Special trades contractors

2.3 INDUSTRY CHARACTERISTICS

As in the proposed rule, several steps are used to define the number of C&D establishments that could be affected by the options EPA considered. First, EPA identifies all C&D establishments, as defined above, using data from the 1997 Census of Construction (see Table 2-1). Second, EPA estimates the number of establishments classified as C&D establishments that are primarily engaged in remodeling work, using data from the National Association of Home Builders (NAHB) and the Joint Center for Housing Studies at Harvard University (Joint Center). Third, EPA estimates the number of establishments classified as C&D establishments that are engaged in C&D activities, but unlikely to disturb 1 or more acres of land or 5 or more acres of land, using data from the Census Bureau and various secondary sources. Section 2.3.1 examines the industrywide characteristics, including the number and size of establishments, employment, and geographic distribution of establishments. Section 2.3.2

⁴ Some detailed breakdowns are available only at the three-digit NAICS level. Separate data for NAICS 2331 cannot be provided and will be included with data for all of NAICS 233. NAICS 233, except 2331, includes data for both residential and nonresidential construction activities. Where more detailed data are available, they are included in this profile. In some cases, data at a more detailed NAICS level are available (e.g., five-digit NAICS) but are too detailed to present in the body of this profile. The availability of such data is noted throughout the profile, and reference is made to Appendix 2A in the Economic Analysis of the proposed rule, where tables present this data (U.S. EPA, 2002).

describes firm-level data for the C&D industry. Section 2.3.3 presents the number of small entities, and Section 2.3.4 examines the number of entities that disturb less than 1 acre during the normal course of business. The estimated number of in scope and potentially affected establishments is presented in Section 2.3.5.

2.3.1 Establishment-Level Data

This section presents data for all establishments within the C&D industry as defined in Section 2.2, based primarily on 1997 Census of Construction sources. It includes information on the number and size, geographic distribution, employment, payroll and benefits, and level of specialization of establishments.

2.3.1.1 Number and Size of Establishments

Data from the Census of Construction indicate that there were a total of 261,617 establishments with payrolls in the C&D industry in 1997 (i.e., NAICS 233, 234, 23593, and 23594; see Tables 2-1 and 2-4). Of these establishments, the largest number are in NAICS 233 (building, developing, and general contracting). This subsector includes 199,289 establishments, representing 76.2 percent of all C&D establishments. Within NAICS 233, single-family home construction (NAICS 23321) accounted for the majority of establishments (138,849 out of 199,289 or 69.7 percent).

Land development and subdevelopment (NAICS 2331) accounted for 8,185 establishments or 3.1 percent of all establishments in the C&D industry. NAICS 234 (heavy construction) includes 42,557 establishments or 16.3 percent of the total. Of these establishments, 27 percent are primarily highway and street construction contractors, while 27 percent are contractors that work on water, sewer, pipeline, communications, and power line projects and 43 percent are engaged in other types of heavy construction (all other heavy construction). Within the special trades contractors subsector (NAICS 235), NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) account for 19,771 establishments, or 7.6 percent of the C&D industry total. Excavation contractors account for more than 90 percent of these establishments.

Table 2-4. Number of Establishments in the C&D Industry, Based on the 1997 Census of Construction

NAICS	Description	Establishments With Payrolls	
		Number	Percent of Total
233	Building, developing, and general contracting	199,289	76.2%
2331	Land development and subdivision	8,185	3.1%
23321	Single-family residential building construction	138,849	53.1%
23322	Multi-family residential building construction	7,543	2.9%
2333	Nonresidential construction	44,710	17.1%
234	Heavy construction	42,557	16.3%
235 ^a	Special trade contracting	19,771	7.6%
SUBTOTAL		261,617	100.0%

^a Covered industry groups include NAICS 23593 (excavation contractors) and NAICS 23594 (wrecking and demolition contractors) only.

Across the board, C&D industry groups are dominated by small establishments.⁵ As shown in Table 2-5, the Census Bureau reports that 60.6 percent of establishments with payrolls have fewer than 5 employees, 77.8 percent have fewer than 10 employees, and 87.1 percent have fewer than 20 employees.⁶ Overall, only 1.1 percent of C&D establishments with payrolls have 100 or more employees. On average, establishments in NAICS 234 (heavy construction) are somewhat larger than those in the other NAICS industry groups, with a lower percentage of establishments appearing in each of the smaller establishment size classes.

⁵ The SBA uses size standards based on either the number of employees or annual revenue (13 CFR 121) to classify establishments as “small”. Qualifying revenue levels differ among NAICS industry groups, and, within the C&D industries, there is a range of qualifying revenue levels, from \$5.0 million for NAICS 23311 (land subdivision and development) to \$27.5 million for the majority of industry groups within NAICS 233 and 234. Under the new 2002 NAICS structure, size standards for construction firms have been updated to \$6.0 million for NAICS 23311 (land subdivision and development) and \$28.5 million for the majority of industry groups within NAICS 233 and 234 (U.S. SBA, 2002). A more detailed review of industry size distribution based on the SBA definitions will be presented as part of the Small Entity Impact Analysis.

⁶ As noted above, 450,338 establishments in the C&D industry have *no* employees.

The preponderance of small establishments is equally apparent when analyzed on the basis of revenue size class. In 1997, 37.1 percent of establishments with payrolls had annual revenues below \$250,000, 54.7 percent had annual revenues below \$500,000, and 69.6 percent had annual revenues below \$1.0 million. These data are shown in Table 2-6. Only 9,118 establishments, representing 3.5 percent of the total, had annual revenues in excess of \$10.0 million. The small business analysis is presented in Chapter 6 of this EA.

In addition to the small establishments with payrolls, a large number of establishments— 450,338 in 1997⁷—operate with no paid employees and are not included in the totals in Tables 2-4 through 2-6. Available data suggest these establishments are very small relative to establishments with payrolls. While employer establishments in NAICS 233 and 234 had \$517.7 billion in receipts for 1997, nonemployer establishments had only \$36.5 billion in receipts, which represents only 7 percent of the receipts of employer establishments.

Table 2-5. Number of Small Establishments with Payrolls in the C&D Industry, Based on Employment

NAICS	Description	Total	Establishments with less than 5 employees		Establishments with less than 10 employees		Establishments with less than 20 employees	
			No.	Percent of Total	No.	Percent of Total	No.	Percent of Total
233 ^a	Building, developing, and general contracting	199,289	138,926	69.7%	172,079	86.3%	187,672	94.2%
234	Heavy construction	42,557	18,956	44.5%	26,802	63.0%	33,337	78.3%
235 ^b	Special trade contractors	19,771	700 ^c	3.5%	4,690	23.7%	6,833	34.6%
TOTAL		261,617	158,582	60.6%	203,571	77.8%	227,842	87.1%

^a Data below the three-digit NAICS (i.e., for NAICS 2331 Land development and subdevelopment) are not publishable.

^b Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).

^c Data for NAICS 23593 (excavation contractors) are not included in this calculation because data did not meet publication standards.

Figures do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2000).

⁷ This figure only includes establishments in NAICS 233 and 234. Data on nonemployer establishments were not available at the five-digit NAICS level for NAICS 235. Thus information for NAICS 23593 and 23594 could not be separated from the rest of NAICS 2359 (other special trade contractors). Including all nonemployer establishments in NAICS 2359 (339,521), the total number of such establishments in the C&D industry is 789,859.

Table 2-6. Number of Small Establishments in the C&D Industry, Based on Value of Business Done

NAICS	Description	Total	Establishments with less than \$250,000 in business		Establishments with less than \$500,000 in business		Establishments with less than \$1 million in business	
			No.	Percent of Total	No.	Percent of Total	No.	Percent of Total
233 ^a	Building, developing, and general contracting	199,289	83,536	41.9%	118,493	59.5%	147,917	74.2%
234	Heavy construction	42,557	13,364	31.4%	20,238	47.6%	26,726	62.8%
235 ^{b,c}	Special trade contractors	19,771	269	1.4%	4,344	22.0%	7,385	37.4%
TOTAL		261,617	97,169	37.1%	143,075	54.7%	182,028	69.6%

^a Data below the three-digit NAICS (i.e., for NAICS 2331 Land development and subdevelopment) are not publishable.

^b Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).

^c Figures could be low due to lack of sufficient data for NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) for values under \$250,000.

Figures do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2000).

The average level of receipts among nonemployer establishments is \$81,000 versus \$1.98 million for establishments with payrolls. A recent study by the Joint Center indicates that a substantial number of the nonemployer establishments—at least 141,000 of those classified as general building contractors (NAICS 233)—are actually remodelers (Joint Center, 2001).⁸ The Joint Center estimates do not account for nonemployer establishments outside NAICS 233 (i.e., NAICS 234 [heavy construction] or 235 [special trades]).

2.3.1.2 Legal Form of Organization

The Census Bureau defines construction establishments according to how they are organized legally, using the following classification scheme: (a) corporations, (b) proprietorships, (c) partnerships, and (d) other. In 1997, a total of 173,602 C&D establishments with payrolls (66.4 percent of the total) were organized as corporations (see Table 2-7). A further 64,733 (24.7 percent) were organized as

⁸ The estimate of 141,000 establishments may be an underestimate. The Joint Center applied the percentage of establishments with payrolls known to be remodelers to the nonemployer establishments. In practice, remodelers probably account for a larger percentage of nonemployer establishments than employer establishments. As the report states, “our procedures thus generate a conservative estimate of the number of businesses concentrating their activities in residential remodeling” (Joint Center, 2001, p. 35).

Table 2-7. Number of Establishments in the C&D Industry with Payrolls, by Legal Form of Organization

NAICS	Description	Corporations		Proprietorships		Partnerships		Other		Total	
		Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
233	Building, developing, and general contracting, except land subdivision and development (2331)	124,475	65.1%	50,235	26.3%	9,827	5.1%	6,567	3.4%	191,104	100.0%
2331	Land subdivision and development	6,268	76.6%	327	4.0%	1,323	16.2%	267	3.3%	8,185	100.0%
234	Heavy construction	30,682	72.1%	8,401	19.7%	2,115	5.0%	1,359	3.2%	42,557	100.0%
235 ^a	Special trade contractors	12,177	61.6%	5,770	29.2%	1,048	5.3%	776	3.9%	19,771	100.0%
TOTAL		173,602	66.4%	64,733	24.7%	14,313	5.5%	8,969	3.5%	261,617	100.0%

^a Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
Source: U.S. Census Bureau (2000).

proprietorships, while 14,313 (5.5 percent) operated as partnerships and 8,969 (3.5 percent) operated under some other legal form of organization. Organization as a corporation is most prevalent in NAICS 2331 (land subdivision and development), at 76.6 percent, and least prevalent in NAICS 235 (special trade contractors), at 61.6 percent. See Appendix 2A in the Economic Analysis of the proposed rule for more detailed industry-level data (U.S. EPA, 2002).

2.3.1.3 Geographic Distribution

Figure 2-1 shows a geographic distribution of establishments by state. The largest concentrations of establishments are in California, New York, Texas, Florida, and Pennsylvania. Combined, these states account for approximately 25 percent of C&D establishments in the United States.

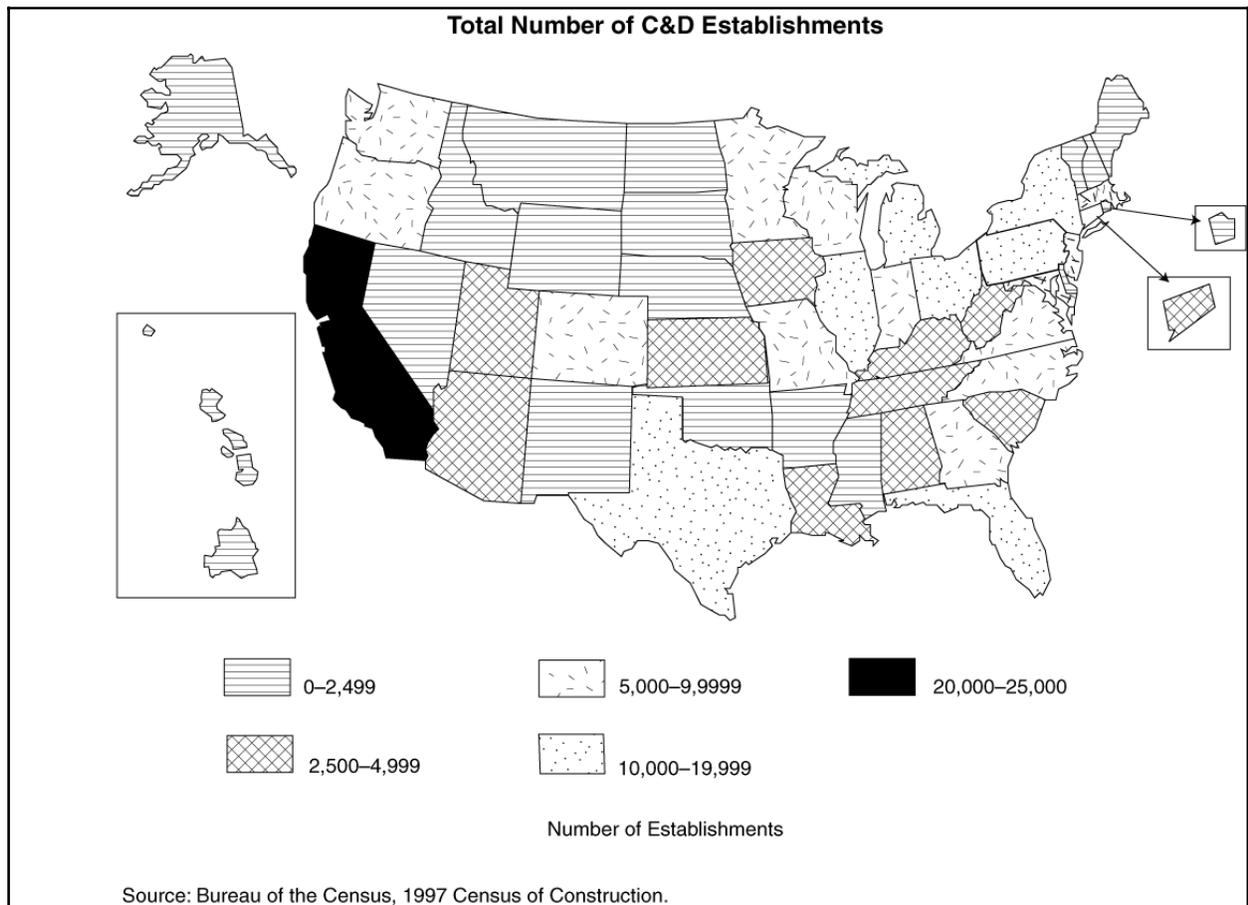


Figure 2-1. Number of Establishments in the C&D Industry, by State, in 1997.

Some commenters said that it was possible that EPA underestimated the number of establishments affected by the options and, therefore, understated costs of the options. EPA believes the estimates are reasonable; the estimates do not affect national costs, which are calculated using the total number of disturbed acres (see Chapter Four).

2.3.1.4 Employment

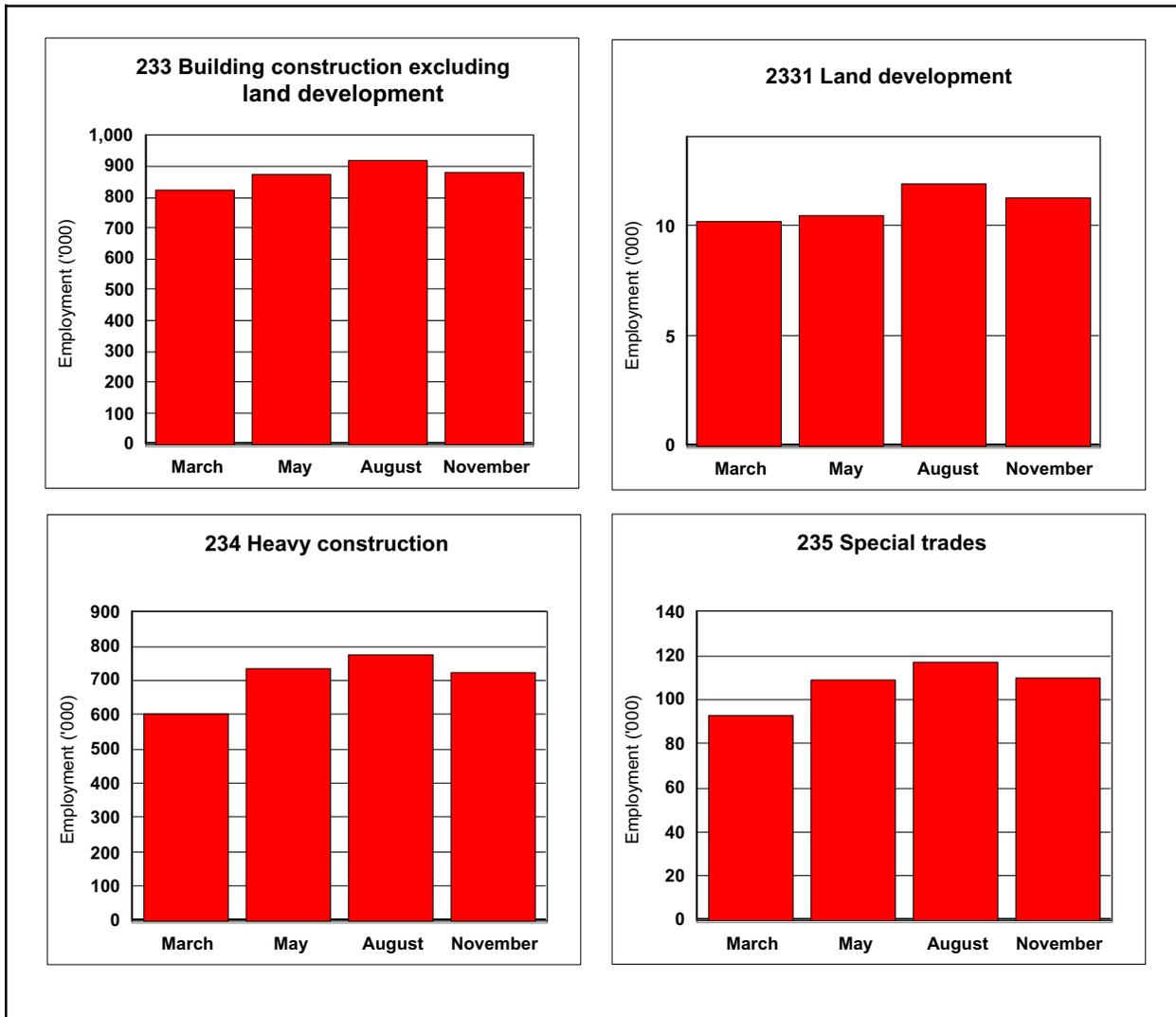
In 1997, establishments with payrolls in the C&D industry employed a total of nearly 2.4 million people. Table 2-8 shows a distribution of employment by NAICS industry group. NAICS 2331 (land subdivision and land development) accounts for 41,827 employees (1.8 percent of the total), while the rest of NAICS 233 (building, developing, and general contracting) accounts for 1.3 million employees, or 55.2 percent of the total. NAICS 234 (heavy construction), employs 880,400 people (37.3 percent of the total), and NAICS 23593 and 23594 (excavation contractors and wrecking/demolition contractors) employ 135,057 people (5.7 percent of the total).

Table 2-8. Number of Employees in the C&D Industry, Establishments With Payrolls, in 1997

NAICS	Description	Number of Employees	Percent of Total
233, except 2331	Building, developing, and general contracting, except land subdivision and land development	1,301,126	55.2%
2331	Land subdivision and land development	41,827	1.8%
234	Heavy construction	880,400	37.3%
235 ^a	Special trade contractors	135,057	5.7%
TOTAL		2,358,410	100.0%

^a Only includes NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).
Source: U.S. Census Bureau (2000).

Construction is a seasonal activity in many parts of the country, and employment data from the industry reflect this fact. Figure 2-2 shows quarterly employment data for all NAICS groups in the C&D industry. It also displays the annual average. Employment of construction workers was lowest in March, at 1.59 million, and highest in August at 1.83 million.



Source: U.S. Census Bureau (2000)

Figure 2-2. Seasonal Trends in Employment in the C&D Industry, 1997.

2.3.1.5 Payrolls and Benefits

In 1997, the payrolls of all C&D industry groups totaled \$76.8 billion (see Table 2-9). Of this number, \$48.3 billion (62.9 percent) went to construction workers and \$28.5 billion (37.1 percent) went

to other employees.⁹ In addition, the C&D industry incurred \$11.2 billion in legally required fringe benefit expenditures and \$6.5 billion in voluntary fringe benefits expenditures, for a total of \$17.6 billion in fringe benefits.¹⁰ Table 2-9 shows detailed data on payrolls and benefits for each of the C&D industry groups.

2.3.1.6 Specialization

Specialization in the C&D industry refers to the percentage of establishment revenues earned from different types of construction activity. Specialization data provide insight into the homogeneity of businesses classified within the same NAICS industry group. Each establishment reports its degree of specialization to the Census Bureau, based on the percentage of revenue earned from each type of construction work. Some establishments in NAICS 23321, for example, are specialized, (i.e., earn 51 percent or more of revenues in either detached single-family housing construction or attached single-family housing construction).¹¹ Establishments that are 100 percent specialized in detached, single-family housing construction performed construction work worth \$90.4 billion, or 64.4 percent of all work done by establishments with specialization in construction work. Similarly, 52.8 percent of the work (\$6.6 billion) was done by establishments with complete specialization in attached single-family houses. Further analysis of the specialization and value of construction work performed by the C&D industry groups can be found in the Economic Assessment for the proposed rule (U.S. EPA, 2002).

⁹ *Construction workers* include all workers, through the working supervisor level, directly engaged in construction operations, such as painters, carpenters, plumbers, and electricians. Included are journeymen, mechanics, apprentices, laborers, truck drivers and helpers, equipment operators, and onsite recordkeepers and security guards. *Other employees* include employees in executive, purchasing, accounting, personnel, professional, technical and routine office functions.

¹⁰ *Legally required contributions* include Social Security contributions, unemployment compensation, workman's compensation, and state temporary disability payments. *Voluntary expenditures* include life insurance premiums, pension plans, insurance premiums on hospital and medical plans, welfare plans, and union negotiated benefits.

¹¹ Although some of them earn revenues from other types of construction (e.g., highway construction) they are no longer be classified in NAICS 23321 if they earn 51 percent or more of their revenue from such sources.

Table 2-9. Payrolls and Benefits for Employees in the C&D (Thousands of 1997 Dollars)

NAICS	Description	Payrolls ^a			Fringe Benefits (All Employees)		
		Construction Worker ^b	Other Employees ^c	All Employees ^d	Legally Required Expenditures ^e	Voluntary Expenditures ^f	Total Fringe Benefits ^g
233	<i>Building, developing, and general contracting</i>	\$23,135,832	\$19,410,280	\$42,546,112	\$5,929,710	\$3,011,115	\$8,940,824
23311	Land subdivision and land development	\$254,247	\$1,255,526	\$1,509,773	\$164,669	\$71,648	\$236,317
23321	Single-family housing construction	\$7,739,858	\$7,224,726	\$14,964,583	\$2,000,118	\$623,079	\$2,623,197
23322	Multifamily housing construction	\$1,022,265	\$744,361	\$1,766,627	\$255,879	\$76,644	\$332,523
23331	Manufacturing and industrial building construction	\$3,322,347	\$1,806,620	\$5,128,967	\$777,829	\$446,522	\$1,224,351
23332	Commercial and institutional building construction	\$10,797,116	\$8,379,046	\$19,176,160	\$2,731,214	\$1,793,222	\$4,524,436
234	<i>Heavy construction</i>	\$22,218,582	\$8,073,267	\$30,291,850	\$4,665,757	\$3,120,979	\$7,786,736
23411	Highway and street construction	\$7,095,139	\$2,432,488	\$9,527,626	\$1,507,465	\$1,109,177	\$2,616,641
23412	Bridge and tunnel construction	\$1,378,759	\$468,401	\$1,847,160	\$344,821	\$263,297	\$608,117
23491	Water, sewer, and pipeline construction	\$4,087,007	\$1,435,273	\$5,522,281	\$844,394	\$493,761	\$1,338,155
23492	Power and communication transmission line construction	\$1,748,715	\$638,717	\$2,387,432	\$374,145	\$231,538	\$605,683
23493	Industrial nonbuilding structure construction	\$2,734,020	\$988,343	\$3,722,363	\$486,625	\$302,813	\$789,439
23499	All other heavy construction	\$5,174,943	\$2,110,046	\$7,284,989	\$1,108,307	\$720,394	\$1,828,701
235 ^h	<i>Special trade contractors</i>	\$2,940,440	\$1,005,609	\$3,946,050	\$582,157	\$329,925	\$912,082
23593	Excavation contractors	\$2,525,857	\$828,017	\$3,353,874	\$483,764	\$283,952	\$767,716
23594	Wrecking and demolition contractors	\$414,583	\$177,592	\$592,176	\$98,393	\$45,973	\$144,366
TOTAL		\$48,294,854	\$28,489,156	\$76,784,012	\$11,177,624	\$6,462,019	\$17,639,642

^a The payroll figures include the gross earnings paid in the calendar year 1997 to all employees on the payrolls of construction establishments. They include all forms of compensation, such as salaries, wages, commissions, bonuses, vacation allowances, sick leave pay, prior to such deductions as employees' Social Security contribution, withholding taxes, group insurance, union dues, and savings bonds.

^b Construction workers include all workers, through the working supervisor level, directly engaged in construction operations, such as painters, carpenters, plumbers, and electricians. Included are journeymen, mechanics, apprentices, laborers, truck drivers and helpers, equipment operators, and onsite recordkeepers and security guards.

^c Other employees include employees in executive, purchasing, accounting, personnel, professional, technical and routine office functions.

^d Sum of construction workers and other employees.

^e Legally required contributions include Social Security contributions, unemployment compensation, workman's compensation, and state temporary disability payments.

^f Voluntary expenditures include life insurance premiums, pension plans, insurance premiums on hospital and medical plans, welfare plans, and union negotiated benefits.

^g Total fringe benefits represent the expenditures made by the employer during 1997 for both legally required and voluntary fringe benefit programs for employees.

^h Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).

Source: U.S. Census Bureau (2000).

2.3.2 Firm-Level Data

The SBA Office of Advocacy contracts with the U.S. Census Bureau to produce firm-level data for U.S. industries. Currently, distributions by employment size are available on a NAICS basis for 2000 and distributions by receipt size are available on a SIC basis for 1997.

The SBA data is based primarily on administrative records and is not generated in conjunction with, or linked to, data collected through the Census of Construction. As a result, there could be minor inconsistencies between data reported by SBA and those reported by the Census of Construction.¹² The SBA/Census of Construction data, however, are the *only* firm-level data available for C&D industry groups, so EPA is including them in this analysis. These data are valuable to the economic modeling and the small entity analysis, which applies at the firm, not the establishment, level.¹³

2.3.2.1 Number and Size of Firms (SBA Data)

Table 2-10 presents the number of firms with payrolls (firms with paid employment) and the number of establishments in the C&D industry in 2000, as reported by SBA.¹⁴ These data indicate that a majority of firms operate a single establishment and have fewer than 20 employees. Of the 214,651 C&D firms tallied by SBA for 2000, approximately 99 percent operate only one establishment, and 93 percent have fewer than 20 employees; less than 1 percent of firms have more than 500 employees. In 2000, there were 38,304 firms in heavy construction, which operated 39,516 establishments. Almost 97

¹² The SBA data, for example, provide estimates of the number of establishments operated by C&D firms. These establishment counts, however, do not match those reported in the Census of Construction. This inconsistency is partially due to differences in coverage (the SBA data include administrative establishments while the Census of Construction does not) as well as differences in data collection methods.

¹³ For clarification, an *establishment* is defined as “a relatively permanent office or other place of business where the usual business activities related to construction are conducted” (U.S. Census Bureau, 2000). A *firm* refers to the aggregation of all establishments owned by one company; one firm, therefore, could consist of several establishments.

¹⁴ “The data excludes non-employer businesses, thus excluding many self-employed individuals (employment is measured in March, so firms starting after March, firms closing before March, and seasonal firms can have zero employment).” SBA Office of Advocacy Website, <<http://www.sba.gov/advo/stats/data.html>>.

percent of the heavy construction firms operate a single establishment, and approximately 78 percent of these firms have fewer than 20 employees.

Table 2-10. Firms and Establishments by Employment Size and NAICS Codes, 2000–(SBA Data)

Description	NAICS	Firms					Establishments				
		Total	0	<20	<500	500+	Total	0	<20	<500	500+
<i>Building, developing, and general contracting</i>	233	214,651	33,472	200,611	214,250	401	216,354	33,474	200,662	214,785	1,569
Land subdivision and land development	23310	12,902	2,982	12,127	12,811	91	13,111	2,984	12,141	12,884	227
Single-family housing construction	23321	150,685	24,403	145,864	150,594	91	151,296	24,403	145,880	150,770	526
Multifamily housing construction	23322	8,208	1,312	7,518	8,177	31	8,254	1,312	7,518	8,191	63
Manufacturing and industrial building construction	23331	6,984	723	5,561	6,920	64	7,039	723	5,562	6,934	105
Commercial and institutional building construction	23332	36,022	4,052	29,549	35,815	207	36,654	4,052	29,561	36,006	648
<i>Heavy construction</i>	234	38,304	4,243	29,702	38,008	296	39,516	4,246	29,724	38,320	1,196
Highway and street construction	23411	10,434	1,267	7,631	10,339	95	10,889	1,267	7,637	10,440	449
Bridge and tunnel construction	23412	872	58	480	846	26	906	58	481	861	45
Water, sewer, and pipeline construction	23491	7,390	578	5,316	7,344	46	7,483	579	5,319	7,371	112
Power and communication transmission line construction	23492	3,411	469	2,630	3,364	47	3,644	470	2,632	3,389	255
Industrial nonbuilding structure construction	23493	631	51	407	568	63	689	51	407	574	115
All other heavy construction	23499	15,702	1,820	13,239	15,594	108	15,905	1,821	13,248	15,685	220
<i>Excavation contractors</i>	23593	26,980	4,966	25,570	26,967	13	27,005	4,966	25,570	26,982	23
<i>Wrecking and demolition contractors</i>	23594	1,733	375	1,447	1,727	6	1,752	375	1,447	1,733	19

Source: U.S. SBA (2000), based on data provided by the U.S. Census Bureau.

2.3.2.2 Firm-Level Revenues (SBA Data)

Table 2-11 shows SBA's data on the number of employer firms and establishments, in 1997, based on NAICS industry group and revenue size class. These data also show that most firms in the C&D industry are small. Approximately three-quarters (75.2 percent) of the firms in the target industry sectors reported under \$1.0 million in revenues for 1997; nearly 94 percent of firms reported revenues lower than \$5.0 million.

2.3.3 Number of Small Entities

SBA uses size standards based on either number of employees or annual revenue to define small entities (13 CFR 121). For all of the C&D industry groups, the size standards are based on annual revenues. Table 2-12 presents the SBA revenue thresholds for the C&D industry, which range from \$5.0 million for NAICS 23310 (land subdivision and land development) to \$27.5 million for the majority of NAICS 233 (building, developing, and general contracting) and NAICS 234 (heavy construction).¹⁵ An estimated 189,805 C&D businesses, representing 99.5 percent of all businesses in the C&D industry, fall below the SBA-defined revenue thresholds for this industry and, therefore, could qualify as small businesses under SBA definitions. Table 2-12 shows the total estimated number of businesses and total small businesses in the C&D industry; the number of potentially affected small businesses is developed in Chapter Six.

2.3.4 Entities Not Covered by the Final Action

Not all establishments and firms that fall within the industry definitions outlined in the previous sections will be affected by the Final Action. The Final Action will apply only to those establishments engaged in activities that disturb land. EPA believes that some entities will be excluded from regulatory coverage under Options 1, 2, and 4 because they are primarily engaged in remodeling activities that will

¹⁵ SBA has revised the small business size standards for some NAICS codes. The new size standards for construction firms have been updated to \$6.0 million for NAICS 23311 (land subdivision and development) and \$28.5 million for the majority of industries within NAICS 233 and 234 (U.S. SBA, 2002).

Table 2-11. Firms and Establishments with Payrolls by Revenue Size Class, 1997^a (SBA Data)

Description	Firms							Establishments ^b						
	Total Number of Firms	< \$1 Million	< \$5 Million	< \$7.5 Million	< \$25 Million	< \$100 Million	More than \$100 Million	Total Establishments	< \$1 Million	< \$5 Million	< \$7.5 Million	< \$25 Million	< \$100 Million	More than \$100 Million
Land subdivision and Development	11,036	7,744	10,207	10,501	10,851	10,948	88	11,205	7,746	10,218	10,514	10,896	11,018	186
Single-family housing Construction	149,130	123,414	145,305	146,917	148,634	148,975	155	149,823	123,420	145,339	146,962	148,736	149,161	661
Multifamily housing Construction	6,911	5,128	6,347	6,518	6,791	6,877	34	7,009	5,129	6,354	6,527	6,810	6,910	99
Manufacturing and industrial building construction	7,950	4,674	6,841	7,156	7,692	7,879	71	8,075	4,675	6,847	7,166	7,713	7,914	160
Commercial and institutional building construction	38,195	22,518	32,523	34,085	36,964	37,882	313	39,044	22,526	32,560	34,133	37,075	38,124	920
Highway and street construction	10,778	5,683	8,681	9,291	10,320	10,679	99	11,117	5,683	8,689	9,302	10,349	10,758	359
Bridge and tunnel construction	875	287	583	638	788	847	28	915	288	584	640	795	859	56
Water, sewer, and pipeline construction	7,916	4,475	6,861	7,245	7,768	7,883	33	8,075	4,476	6,864	7,251	7,791	7,938	137
Power and communication transmission line construction	2,781	1,572	2,411	2,546	2,729	2,770	11	2,837	1,572	2,412	2,548	2,738	2,789	48
Industrial nonbuilding structure construction	3,941	2,786	3,612	3,713	3,860	3,909	32	4,023	2,787	3,617	3,720	3,874	3,936	86
All other heavy construction	12,973	9,110	11,873	12,213	12,697	12,863	111	13,594	9,118	11,920	12,279	12,814	13,087	507
Excavation contractors	22,046	19,093	21,659	21,820	22,002	22,038	8	22,072	19,093	21,661	21,823	22,005	22,055	17
Wrecking and demolition contractors	1,270	840	1,165	1,204	1,249	1,261	9	1,285	840	1,166	1,205	1,252	1,271	14
TOTAL	275,802	207,324	258,068	263,847	272,345	274,811	992	279,074	207,353	258,231	264,070	272,848	275,820	3,250

^a Data are for 1997. SBA does not report revenue size class data in NAICS format and will not do so until the 2002 Economic Census is published. These figures were calculated using percentages provided in the Census Bureau's NAICS to SIC bridge, which is available at www.census.gov/epcd/ec97brdg.HTM.

^b The number of establishments reported here could differ from the number reported in previous tables due to the different sources used (see Table 2-2 and accompanying text for further discussion). Earlier tables are based on data from the 1997 Economic Census; Table 2-11 is based on 1997 data from SBA/Census of Construction and was converted from SIC to NAICS for the purposes of this analysis.

Source: U.S. SBA (2000)

Table 2-12. Number of Firms and Establishments Above and Below SBA Thresholds for Small Business Definition: (SBA Data)

NAICS	SBA Revenue Threshold (million \$)	Total Estimated Number of Businesses	Estimated Number of Small Businesses	Small Businesses as a Percent of Total
23321: Single-family housing construction	\$27.5	138,732	138,583	99.9%
23322: Multifamily housing construction	\$27.5	7,534	7,491	99.4%
23331: Manufacturing and industrial building construction	\$27.5	7,257	7,050	97.1%
23332: Commercial and institutional building construction	\$27.5	37,220	36,681	98.6%
TOTAL	–	190,743	189,805	99.5%

Note: For those industry groups with a \$27.5 million SBA cutoff, the table shows the number of firms and establishments with revenues below \$25.0 million (the next closest SBA data break point). For industry groups with a \$11.5 million SBA cutoff, figures shown are for firms and establishments with revenues below \$7.5 million. SBA has adopted the 2002 NAICS classification and revised small business size standards. The new size standards for construction firms have been updated to \$6.0 million for NAICS 23311 (land subdivision and development) and \$28.5 million for the majority of industry groups within NAICS 233 and 234 (U.S. SBA, 2002). This change is not reflected in this study because since the SBA data break points remain unchanged. Source: U.S. SBA (2000); also, see Chapter Six.

not result in land disturbance. Others will be excluded because they are, generally, not the primary NPDES permit holder. As discussed in Section IV.A in the preamble of the proposed rule, special trade contractors are typically not identified as NPDES permit holders and are therefore unlikely to be covered by the Final Action. In this section, EPA provides estimates of the number of establishments that fall into this category. The resulting estimates are brought together in Section 2.3.5 to derive final estimates of the number of establishments covered by the Final Action.

2.3.4.1 Establishments Engaged in Remodeling

Two sources provide information on the potential number of C&D establishments that are actually remodelers. In an article published in *Housing Economics*, NAHB economists estimated that, in 1997, approximately 45,952 establishments in the residential building industry were involved in *remodeling activities only* (Ahluwalia and Chapman, 2000). This count is based on analysis of census microdata on establishments, receipts, and source of receipts. Establishments were classified as remodelers in this study if they earned *100 percent* of revenues from remodeling activities.

The Joint Center recently published a report on the remodeling industry (Joint Center, 2001). This report classified establishments that derive *at least half* of their revenues from remodeling activities as remodelers. When defined in this manner, the study found that 62,400 establishments classified as general contractors/builders in 1997 were actually remodelers.

Both of these estimates pertain to establishments classified by the Census of Construction as *general contractors/builders*. The Joint Center study goes further to identify establishments classified in various special trades (e.g., carpentry and plumbing) that are primarily engaged in remodeling, but these estimates do not include establishments that are considered part of the C&D industry (i.e., NAICS 23593, excavation contractors, and 23594, wrecking and demolition contractors).¹⁶ NAHB does not address the issue of special trades contractors in its report. Neither report addresses the number of establishments in NAICS 234 (heavy construction) that could be engaged primarily in remodeling activities; EPA, however, does not expect that establishments in the heavy construction sector would be engaged primarily in remodeling activities.

After reviewing these studies, EPA concluded that the Joint Center's estimate of the number of remodelers included in C&D industry statistics was the best. This study defines remodelers as establishments that earn at least 50 percent of their revenues from remodeling (and thus earn less than 50 percent from building activity). EPA concludes that these establishments, when engaged in building

¹⁶ The Joint Center study does provide an estimate for the number of remodelers classified in "miscellaneous special trades" (NAICS 2359), which includes NAICS 23593, NAICS 23594, and several other industry groups. The number of remodelers classified primarily in NAICS 23593 and 23594, is not necessarily large, however, as the total number in NAICS 2359 is only 6,600.

activity, are unlikely to disturb more than 1 acre of land and would, therefore, not be covered by the Final Action.

2.3.4.2 Establishments That Are Not NPDES Permittees

In the universe of potentially affected establishments, EPA has included all establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors) because such establishments engage in land disturbing activities. In reality, however, establishments in these industries generally act as subcontractors on C&D projects and are hired by developers or general contractors to perform specific tasks. EPA does not believe that such establishments generally appear as NPDES permittees or copermitees. While these establishments are included among the universe of potentially affected establishments (and appear in Table 2-13), EPA has not included them in the subsequent economic analysis chapters (e.g., Chapters Four, Five, and Six).

2.3.5 Number of Potentially Affected Entities

EPA took several steps to adjust the number of affected entities to account for regulatory coverage and data availability. Previous sections estimated that the total number of establishments in the C&D industry is 261,617 (see Table 2-4). Subtracting the 62,400 remodeling establishments estimated in Section 2.3.4.1 from this figure yields a *potentially affected* universe of 199,217 establishments. EPA allocated the 62,400 residential remodeling establishments between the single-family and multifamily building construction industry groups (NAICS 23321 and NAICS 23322), based on their respective share of all residential building establishments.

In preparing its economic impact analysis, EPA concluded that data limitations on land developers (NAICS 2331) would preclude retaining them as a separate industry group for purposes of regulatory analysis.¹⁷ Rather than excluding establishments in this industry group (which would cause EPA to potentially underestimate the number of affected entities and associated impacts), EPA distributed

¹⁷ Specifically, EPA could not obtain equivalent financial data with which to build financial models of the land development industry.

them among the four building construction industry groups (single-family, multifamily, commercial, and industrial construction), based on each industry group's share of total establishments.¹⁸

Table 2-13 reflects this allocation, which was completed after removing establishments primarily engaged in remodeling.

EPA has further adjusted the population of affected establishments to account for differences in regulatory coverage. As described in Chapter Three, the Final Action considers three erosion and sediment control (ESC) options. Option 1 applies to sites that disturb 1 acre or more of land, while Options 2 and 4 apply to operations that disturb 5 acres or more of land at a site. Option 3 is the no-rule option, meaning that no sites or establishments would be affected.

EPA used data from the Census Bureau 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 classes of establishments that would be excluded based on their likelihood of disturbing less than 1 acre (Option 1) or 5 acres (Options 2 and 4) on a project basis. EPA believes that these estimates (of establishments unaffected by the Final Action) are conservative. First, while the regulatory threshold applies to each *site*, EPA excluded establishments if the estimated number of acres disturbed *in a year* was below the regulatory threshold. In addition, the analysis was not adjusted for the percentage of site area normally left undisturbed.¹⁹

¹⁸ EPA provides further justification for and details about this step in Chapter Four.

¹⁹ An establishment that completes 15 houses per year, for example, is estimated to account for 5.6 acres of converted land, based on the average housing density of 2.67 new single-family housing units per acre. EPA would include this establishment among those covered under Option 2, although the actual area disturbed could be less than 5 acres after factoring in open space, buffers, and other "undisturbed" areas. Furthermore, as noted, EPA assumes that all of the housing units are covered by a single NPDES permit, while in reality the establishment could operate on several sites, none of which exceeds the 5-acre threshold.

Table 2-13. Number of Potentially Affected and In-scope Establishments in the C&D Industry

NAICS	Description	Total Number of Establishments	Total Number of Establishments with Removal of 62,400 Remodelers	Allocation of NAICS 2331 to NAICS 233	Option 1		Options 2 and 4	
					<1 Acre Exclusion ^b	Excluding Special Trades	<5 Acre Exclusion ^c	Excluding Special Trades
233210	Single-family housing construction	138,849	79,664	84,731	34,070	34,070	21,362	21,362
233220	Multifamily housing construction	7,543	4,328	4,603	4,603	4,603	2,699	2,699
233320	Commercial and institutional building construction	37,430	37,430	39,810	39,810	39,810	39,810	39,810
233310	Manufacturing and industrial building construction	7,279	7,279	7,742	7,742	7,742	7,742	7,742
Total NAICS 233, except 2331		191,104	128,701	136,886	86,225	86,225	71,613	71,613
2331	Land subdivision and development	8,185	8,185	--	--	--	--	--
234	Heavy construction	42,557	42,557	42,557	42,557	42,557	42,557	42,557
235 ^a	Special trade contractors	19,771	19,771	19,771	19,771	--	19,771	--
Total		261,617	199,217	199,217	148,553	128,782	133,941	114,170

^a Only covers establishments in NAICS 23593 (excavation contractors) and 23594 (wrecking and demolition contractors).

^b Excludes 50,661 firms constructing single-family homes.

^c Excludes 12,708 firms constructing single-family homes and 1,904 firms constructing multifamily housing.

Note: Numbers do not necessarily add to totals due to rounding.

Source: U.S. Census Bureau (2000).

Based on this analysis, EPA assumed that establishments in the single-family building construction industry (NAICS 2331) that complete between one and four housing units each year are excluded under Option 1. Under Option 2, EPA also assumed that establishments in the single-family building construction industry (NAICS 2331) that complete between five and nine housing units and establishments in the multifamily building construction industry (NAICS 2332) that complete between two and nine housing units each year, are excluded. Although comments were received on this assumption, EPA believes it is justified in making this adjustment (see Chapter One and the Response to Comments Document [U.S. EPA 2004]). Chapter Four contains further detail on the data sources and method used to make this adjustment.

Table 2-13 summarizes the steps followed to make the adjustment, from the 261,617 establishments reported in Table 2-4 to the distribution of establishments potentially affected under Options 1, 2, and 4. It shows the removal of remodelers, the redistribution of land developers (NAICS 2331), and the removal of small builders considered exempt under the site size exclusions of each option. It also shows the removal of the special trades industry groups under each option. As discussed in Section XII of the Preamble of the proposed rule, special trade contractors are not included in Chapter Five (Economic Impact Analysis Results) of this report. Special trade contractors are typically subcontractors and generally are not NPDES permittees. These contractors, therefore, will not be directly affected by any of the options considered, regardless of EPA's choice. Due to limited data, the number of establishments in NAICS 234 (heavy construction) affected under each option could not be refined further, so no adjustments were made to these establishment counts.

2.4 INDUSTRY DYNAMICS

For purposes of the economic analysis, EPA selected 1997 as the baseline year for constructing financial models. In part this reflects the availability of data from the 1997 Census of Construction, but in addition, EPA believes 1997 to be a reasonably representative year for the affected industry group. Costs, however, reflect year 2000 dollars (see Chapter Four). Before reaching the conclusion to use 1997 financial data, EPA examined historical activity data for the construction industry, reviewed analyses of recent trends, and looked at projections for the future. As a result of this review, EPA concluded the following:

- Historically, construction activity has been highly cyclical. Data from 1959 through 2002 for new housing units authorized by building permit show an overall growth trend that is punctuated by cyclical swings (see Figure 2-3). Highs were reached in 1972, 1978, and 1986 and lows were reached in 1974, 1982, and 1991.
- Since 1991, the industry has been on a fairly continuous growth trend. Single-family housing, for example, grew from an annual level of 0.7 million new units in 1991 to 1.3 million new units in 2002, which represents an average annual growth rate of 6.8 percent. During this same period, real GDP grew by an average of 3.8 percent per year (BEA, 2003).
- Structural changes in the market have made construction less cyclical than before. In a recent analysis, the NAHB identified several factors that contributed to the reduction in cyclical activity of housing market activity. These factors include the easing of rules on credit availability, the subsequent development of adjustable-rate mortgage instruments, and the maturation of the secondary market for mortgage-backed securities (NAHB, no date).
- The Next Decade for Housing, an NAHB report, predicts that between 2001 and 2010 the nation will build an average of 1.82 million new homes per year, up from an average of 1.66 million per year between 1991 and 2000 (see Table 2-14).
- A surprising feature of the most recent economic slowdown is that it has not significantly affected construction activity, particularly, new home construction. As NAHB's chief economist wrote in early 2002, "Believe it or not, 2001 turned out to be a record year for sales of both new and existing homes, despite three quarters of economic recession and the shock of the terrorist attacks" (Seiders, 2002).

Based on this review, EPA concluded that financial data from the year 1997 provide a reasonable basis for characterizing the industry groups likely to be affected by the Final Action. In particular, EPA concluded that there is nothing to suggest that 1997 represents a particularly robust year.

2.5 INTERNATIONAL COMPETITIVENESS

Construction activities are highly localized, with most activities being performed either in the state of the establishment or in neighboring states. Some of the largest builders could perform work nationwide. The Census of Construction includes only construction activities within the United States; it does not mention construction work that U.S. establishments conducted outside the U.S. (U.S. Census Bureau, 2000). EPA concludes that U.S. construction firms conduct a negligible amount of work outside of the United States.

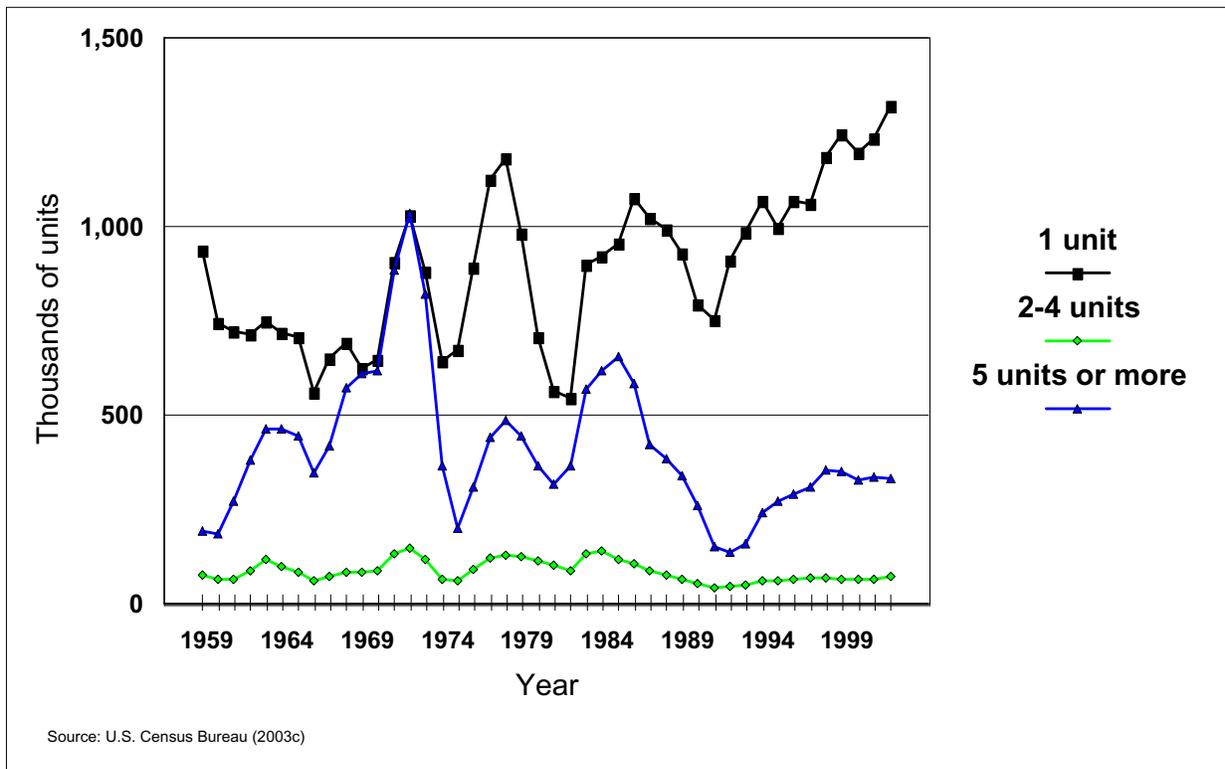


Figure 2-3. New Privately Owned Housing Units Authorized by Building Permits in Permit-Issuing Places: Annual Data

Table 2-14. Housing Supply and Demand - Historical Data and Projections for 2001-2010 (average per year in thousands)

	1971-1980	1981-1990	1991-2000	2001-2010 Projection
Change in households	1,578	1,281	1,137	1,255
Change in vacancies	151	219	184	223
Net removals	333	214	343	344
TOTAL DEMAND	2,062	1,714	1,664	1,822
New single-family	1,110	979	1,108	1,203
New multifamily	602	491	257	343
Mobile homes	349	244	298	276
TOTAL SUPPLY	2,062	1,714	1,664	1,822

Source: NAHB (no date); based on U.S. Census Bureau data and NAHB forecasts.

2.6 REFERENCES

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Appendix 2a. Crosswalk between 1997 NAICS and 2002 NAICS structures

2002 NAICS Code	Description	Relevant 1997 NAICS codes
236	Construction of buildings	
2361	Residential building construction	
23611	Residential building construction	
236115	New single-family housing construction (except operative builders)	233210 Single-family housing construction (except operative builders and remodeling contractors)
236116	New multifamily housing construction (except operative builders)	233220 Multifamily housing construction (except barrack and dormitory construction, operative builders, and remodeling contractors)
236117	New housing operative builders	233210 Single-family housing construction (operative builders) 233220 Multifamily housing construction (operative builders)
236118	Residential remodelers	233210 Single-family housing construction (remodeling contractors) 233220 Multifamily housing construction (remodeling contractors)
2362	Nonresidential building construction	
236210	Industrial building construction	233310 Manufacturing and industrial building construction (except grain elevators, dry cleaning plants, and manufacturing and industrial warehouses) 234930 Industrial nonbuilding structure construction (process batch plants, incinerators, industrial furnaces and kilns, mining appurtenance, and construction management of these projects) 234990 All other heavy construction (waste disposal plant construction)
236220	Commercial and institutional building construction	233220 Multifamily housing construction (barrack and dormitory construction) 233310 Manufacturing and industrial building construction (grain elevators, dry cleaning plants, and manufacturing and industrial warehouses) 233320 Commercial and institutional building construction 235990 All other special trade contractors (indoor swimming pools)
237	Heavy and civil engineering construction	
2371	Utility system construction	
237110	Water and sewer line and related structures construction	234910 Water, sewer, and pipeline construction (water/sewer pumping stations, sewage collection and disposal lines, storm sewers, sewer/water mains and lines, water storage tanks and towers, and construction management of these projects) 234990 All other heavy construction (irrigation systems, sewage treatment and water treatment plants, construction management of these projects) 235810 Water well drilling contractors

Appendix 2a. Crosswalk between 1997 NAICS and 2002 NAICS structures

2002 NAICS Code	Description	Relevant 1997 NAICS codes
237120	Oil and gas pipeline and related structures construction	213112 Support activities for oil and gas operations (construction of field gathering lines on a contract basis) 234910 Water, sewer, and pipeline construction (gas and oil pumping stations, gas and oil pipeline construction, gas mains, gas and oil storage tank construction, and construction management of these projects) 234930 Industrial nonbuilding structure construction (petrochemical plants, refineries, and construction management of these projects)
237130	Power and communication line and related structures construction	234920 Power and communication transmission line construction 234930 Industrial nonbuilding structure construction (power generation plants (excluding hydroelectric dams), transmission and distribution transformer stations, and construction management of these projects)
2372	Land subdivision	
237210	Land subdivision	233110 Land subdivision and land development
2373	Highway, street, and bridge construction	
237310	Highway, street, and bridge construction	234110 Highway and street construction 234120 Bridge and tunnel construction (bridge construction) 235210 Painting and wall covering contractors (highway and traffic line painting)
2379	Other heavy and civil engineering construction	
237990	Other heavy and civil engineering construction	234120 Bridge and tunnel construction (tunnel construction) 234990 All other heavy construction (except waste disposal plant construction, irrigation systems, sewage treatment and water treatment plants, right-of-way cleaning and line slashing, blasting, trenching, and equipment rental with operator) 235990 All other special trade contractors (anchored earth retention contractors)
238	Special trade contractors	
2389	Other specialty trade contractors	
238910	Site preparation contractors	213112 Support activities for oil and gas operations 213113 Support activities for coal mining 213114 Support activities for metal mining 213115 Support activities for nonmetallic minerals (except fuels) 234990 All other heavy construction (right-of-way cleaning and line slashing, blasting, trenching, and equipment rental (except cranes) with operator) 235110 Plumbing, heating, and air-conditioning contractors (septic tank, cesspool, and dry well construction contractors) 235930 Excavation contractors 235940 Wrecking and demolition contractors 235990 All other special trade contractors (dewatering contractors, core drilling for construction, and test drilling for construction)

Source: U.S. Census Bureau (2003b).

CHAPTER THREE

DESCRIPTION OF THE REGULATORY OPTIONS

Chapter One provided a summary of the Phase I and Phase II National Pollutant Discharge Elimination System (NPDES) Stormwater Regulations and the Construction General Permit (CGP) for the construction industry. This chapter describes the effluent limitation guidelines and standards (ELGS) program (Section 3.1), recaps the existing requirements under the CGP (Section 3.2), and presents EPA’s options that are considered for the Final Action (Section 3.3).

3.1 EFFLUENT LIMITATION GUIDELINES AND STANDARDS

The Federal Water Pollution Control Act, passed in 1972 (CWA, 33 U.S.C. §1251 *et seq.*), established a comprehensive program to “restore and maintain the chemical, physical, and biological integrity of the Nation's waters” (§101(a)), often referred to as “fishable, swimmable” status. The statute was amended in 1987 to provide for a program to address stormwater discharges. In addition, under sections 301, 304, 306, and 307 of the Clean Water Act (CWA), EPA is authorized to establish ELGs and pretreatment standards for industrial dischargers. EPA is authorized to publish the following standards:

- ***Best Practicable Control Technology Currently Available (BPT)***. These rules apply to direct dischargers. Generally, BPT limitations are based on the average of the best existing performances by plants of various sizes, ages, and unit processes within a point source category or subcategory.
- ***Best Available Technology Economically Achievable (BAT)***. These rules apply to direct discharges of toxic and nonconventional¹ pollutants.

¹ Toxic pollutants are listed in Table 1 of U.S.C 1317 section 307(a)(1) and currently include 64 pollutants and their organic and inorganic compounds. This list includes arsenic, DDT, lead, and mercury. Nonconventional pollutants are any pollutants that are not statutorily listed (not covered by the list of toxic or conventional pollutants) or which are poorly understood by the scientific community.

- **Best Conventional Pollutant Control Technology (BCT).** These rules apply to direct discharges of conventional pollutants.² BCT limitations are generally established using a two-part cost-reasonableness test. BCT replaces BAT for control of conventional pollutants.
- **Pretreatment Standards for Existing Sources (PSES).** PSES are analogous to BAT controls. These rules apply to existing indirect dischargers (i.e., dischargers to publicly owned treatment works (POTWs)).
- **New Source Performance Standards (NSPS).** These rules apply to discharges of all pollutants from new sources.
- **Pretreatment Standards for New Sources (PSNS).** PSNS are analogous to NSPS controls. These rules apply to new indirect dischargers (i.e., dischargers to POTWs).

Under the ELGs analyzed in this EA, EPA considered BAT, BPT, BCT, and NSPS guidelines and standards for erosion and sediment control (ESC) during the active construction phase.

3.2 REQUIREMENTS UNDER THE EXISTING CONSTRUCTION GENERAL PERMIT

EPA's CGP, published in 1992, replaced in 1998, and replaced again in July 2003, directs NPDES permittees to prepare a stormwater pollution prevention plan (SWPPP) for certain construction activities. The CGP also calls for installation of temporary sediment basins for construction sites with disturbed area of 10 acres or more. For projects disturbing less land, no specific ESCs are required. A description of ESCs is to be contained in the SWPPP. The CGP requires the SWPPP to contain a description of all post-construction stormwater management measures that will be installed during the construction process to control pollutants in stormwater discharges after construction operations have been completed, but no specific measures are required. As with ESCs, selected best management practices (BMPs) are to be described in the SWPPP. The latest revision of the CGP expands the scope of the permit to cover sites of 1 acre or more (the Phase II sites). See Chapter One for more information on the recently revised CGP.

² Conventional pollutants include biochemical oxygen demand (BOD), total suspended solids (TSS), fecal coliform, pH, and oil and grease.

3.3 SUMMARY OF REGULATORY OPTIONS/TECHNOLOGY ALTERNATIVES

EPA presents the analyses of four regulatory options in this EA:

- Option 1, which requires enhanced inspection and BMP certification for all construction sites where 1 acre of land or more is disturbed;
- Option 2, which provides for codification of the CGP with enhanced inspection and BMP certification for all construction sites where 5 acres of land or more are disturbed;
- Option 3, which is a no-rule option; and
- Option 4, a modified Option 2, which provides for codification of the CGP and applies to all sites where 5 acres of land or more are disturbed, but does not require enhanced inspection and BMP certification.

EPA has defined the baseline for the Final Action as full compliance with the current Phase I and Phase II NPDES stormwater regulations (see Chapter One). EPA also assumes full compliance with applicable state regulations (See Chapter Four, Section 4.1.2 for a discussion of EPA’s state regulation equivalency analysis). Table 3-1 summarizes the regulatory options under this baseline. Throughout the analysis presented in this report, EPA treats the baseline as “Option 3.” This table also provides a crosswalk between current options, proposed options, and the options as they are labeled in certain final ELG option selection materials that are found in the Rulemaking Record.

EPA’s choice of option for the Final Action is discussed in the Preamble to the Final Action. All four options (Options 1, 2, 3, and 4) are discussed in this report as equally possible choices for EPA’s Final Action.

3.3.1 Option 1

Option 1 is designed to amend the section of the Code of Federal Regulations (CFR) covering NPDES permitting, 40 CFR Part 122, adding a new paragraph (t) entitled *Inspection and Certification for Construction Site Stormwater Discharges* to § 122.44. These provisions are unchanged from proposal and are designed to include:

Table 3-1. Summary of Regulatory Options Considered for the Final Action

Option	Description	Regulatory Mechanism	Applicability	Option at Proposal	Option Label in EPA Briefing Materials
Option 1	Enhanced inspection and BMP certification	Amendment to NPDES stormwater permitting regulations	Sites of 1 acre or more	Option 1 (unchanged)	NA
Option 2	Provisions to codify the CGP with enhanced inspection and BMP certification requirements	ELGs	Sites of 5 acres or more	Option 2 (unchanged)	Option B
Option 3	No regulation (baseline)	N/A	All sites	Option 3 (unchanged)	Option C
Option 4	Provisions to codify the CGP	ELGs	Sites of 5 acres or more	NA	Option A

- (a) Site log book. The permittee for a point source discharge under § 122.26(b)(14)(x) or § 122.26(b)(15) shall maintain a record of site activities in a site log book. The site log book shall be maintained as follows:
- (i) A copy of the site log book shall be maintained on site and be made available to the permitting authority upon request;
 - (ii) In the site log book, the permittee shall certify, prior to the commencement of construction activities, that any plans required by the permit meet all Federal, State, Tribal and local erosion and sediment control requirements and are available to the permitting authority;
 - (iii) The permittee shall have a qualified professional (knowledgeable in the principles and practices of erosion and sediment controls, such as a licensed professional engineer, or other knowledgeable person) conduct an assessment of the site prior to groundbreaking and certify in the log book that the appropriate best management practices (BMPs) described in plans required by the permit have been adequately designed, sized and installed to ensure overall preparedness of the site for initiation of groundbreaking activities. The permittee shall record the date of initial groundbreaking in the site log book. The permittee shall also certify that any inspection, stabilization and BMP maintenance requirements of the permit have been satisfied within 48 hours of actually meeting such requirements; and

- (iv) The permittee shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis;
- (b) Site Inspections. The permittee or designated agent of the permittee (such as a consultant, subcontractor, or third-party inspection firm) shall conduct regular inspections of the site and record the results of such inspection in the site log book in accordance with paragraph (t)(1) of this section.
 - (i) After initial groundbreaking, permittees shall conduct site inspections at least every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. These inspections shall be conducted by a qualified professional. During each inspection, the permittee or designated agent shall record the following information:
 - (A) Indicate on a site map the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14 days;
 - (B) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;
 - (C) Indicate all disturbed site areas that have not undergone active site work during the previous 14 days;
 - (D) Inspect all sediment control practices and note the approximate degree of sediment accumulation as a percentage of the sediment storage volume (for example 10 percent, 20 percent, 50 percent, etc.). Note all sediment control practices in the site log book that have sediment accumulation of 50 percent or more; and
 - (E) Inspect all erosion and sediment control BMPs and note compliance with any maintenance requirements such as verifying the integrity of barrier or diversion systems (e.g., earthen berms or silt fencing) and containment systems (e.g., sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document in the site log book any excessive deposition of sediment or ponding water along barrier or diversion systems. Note the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water.
 - (ii) Prior to filing of the Notice of Termination or the end of permit term, a final site erosion and sediment control inspection shall be conducted by the permittee or designated agent. The inspector shall certify that the site has undergone final stabilization as required by the permit and that all temporary erosion and

sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

Option 1 is also designed to amend §122.44(i)(4) to *exclude* construction activities from requirements for monitoring of stormwater discharges.

Option 1 is designed to apply to sites where 1 acre of land or more is disturbed.

3.3.2 Option 2

Option 2 is designed to add a new section to the ELGs section of the CFR (i.e., Part 450—Construction and Development Point Source Category). Option 2 remains unchanged from proposal. This section is intended to essentially codify in the CFR the provisions of the CGP (see Section 3.2) and, in addition, is intended to add the provisions for inspection and certification introduced under Option 1 (Section 3.3.1). Option 2 is designed to amend 40 CFR 122(i)(3) to specify that discharges from construction activity are instead governed by Part 450.

40 CFR Part 450, Subpart A describes applicability and provides definitions. Subpart B is intended to establish the ESC requirements based on application of BPT, BAT, BCT, and NSPS.

Under Option 2, Part 450 is intended to apply to C&D activities subject to an NPDES permit under the definition of “construction activity” at 40 CFR 122.26(b)(14)(x). Section 450.11 establishes some general definitions for the following terms: BMPs, commencement of construction, final stabilization, groundbreaking, new source, operator, perimeter controls, qualified professional, runoff coefficient, and stabilization.

Section 450.21 is designed to establish effluent limitations reflecting BPT, as follows:³

³ Parts 450.22, 450.23, and 450.24 would establish identical requirements for BAT, BCT, and NSPS, respectively.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the application of BPT. Permittees with operational control of construction plans and specification, including the ability to make modifications to those plans and specifications (e.g., developer or owner), must ensure the project specifications that they develop meet the minimum requirements of a SWPPP, which are listed in § 450.21(d):

- (a) General Erosion and Sediment Controls. Each SWPPP shall include a description of appropriate controls designed to retain sediment on site to the extent practicable. These general erosion and sediment controls shall be included in the SWPPP developed pursuant to paragraph (d) of this section. The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Stabilization practices may include:
 - (1) Establishment of temporary or permanent vegetation;
 - (2) Mulching, geotextiles, or sod stabilization;
 - (3) Vegetative buffer strips;
 - (4) Protection of trees and preservation of mature vegetation.

- (b) Sediment Controls. The SWPPP must include a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable.
 - (1) For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2 year, 24-hour storm from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location it is not necessary to include flows from off-site areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin.
 - (2) In determining whether a sediment basin is attainable, the operator may consider factors such as site soils, slope, available area on site, etc. In any event, the operator must consider public safety, especially as it relates to children, as a

design factor for the sediment basin, and alternative sediment controls shall be used where site limitations would preclude a safe basin design.

- (3) For portions of the site that drain to a common location and have a total contributing drainage area of less than 10 disturbed acres, the operator should use smaller sediment basins and/or sediment traps.
- (4) Where neither a sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

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

- (1) Litter, construction chemicals, and construction debris exposed to stormwater shall be prevented from becoming a pollutant source in stormwater discharges (e.g., screening outfalls, picked up daily); and
- (2) A description of construction and waste materials expected to be stored on-site with updates as appropriate, and a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response.

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

- (1) A narrative description of the construction activity, including a description of the intended sequence of major activities that disturb soils on the site (major activities include grubbing, excavating, grading, and utilities and infrastructure installation, or any other activity that disturbs soils for major portions of the site);
- (2) A general location map (e.g., portion of a city or county map) and a site map. The site map shall include descriptions of the following:
 - (i) Drainage patterns and approximate slopes anticipated after major grading activities;
 - (ii) The total area of the site and areas of disturbance;

- (iii) Areas that will not be disturbed;
 - (iv) Locations of major structural and nonstructural controls identified in the SWPPP;
 - (v) Locations where stabilization practices are expected to occur;
 - (vi) Locations of off-site material, waste, borrow or equipment storage areas;
 - (vii) Surface waters (including wetlands); and
 - (viii) Locations where stormwater discharges to a surface water;
- (3) A description of available data on soils present at the site
 - (4) A description of BMPs to be used to control pollutants in stormwater discharges during construction as described elsewhere in this section
 - (5) A description of the general timing (or sequence) in relation to the construction schedule when each BMP is to be implemented;
 - (6) An estimate of the pre-development and post-construction runoff coefficients of the site;
 - (7) The name(s) of the receiving water(s);
 - (8) Delineation of SWPPP implementation responsibilities for each site owner or operator;
 - (9) Any existing data that describe the stormwater runoff characteristics at the site.
- (e) Updating the SWPPP. The operator shall amend the SWPPP and corresponding erosion and sediment control BMPs whenever:
- (1) There is a change in design, construction, or maintenance that has a significant effect on the discharge of pollutants to waters of the United States which has not been addressed in the SWPPP; or
 - (2) Inspections or investigations by site operators, local, State, Tribal or Federal officials indicate that the SWPPP is proving ineffective in eliminating or significantly minimizing pollutant discharges.

- (f) Site Log Book/Certification. The operator shall maintain a record of site activities in a site log book, as part of the SWPPP. The site log book shall be maintained as follows:
- (1) A copy of the site log book shall be maintained on site and be made available to the permitting authority upon request;
 - (2) In the site log book, the operator shall certify, prior to the commencement of construction activities, that the SWPPP prepared in accordance with paragraph (d) of this section meets all Federal, State and local erosion and sediment control requirements and is available to the permitting authority;
 - (3) The operator shall have a qualified professional conduct an assessment of the site prior to groundbreaking and certify in the log book that the appropriate BMPs and erosion and sediment controls described in the SWPPP and required by paragraphs (a), (b), (c) and (d) of this section have been adequately designed, sized and installed to ensure overall preparedness of the site for initiation of groundbreaking activities. The operator shall record the date of initial groundbreaking in the site log book. The operator shall also certify that the requirements of paragraphs (g), (h) and (i) of this section have been satisfied within 48 hours of actually meeting such requirements;
 - (4) The operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.
- (g) Site Inspections. The operator or designated agent of the operator (such as a consultant, subcontractor, or third-party inspection firm) shall conduct regular inspections of the site and record the results of such inspection in the site log book in accordance with paragraph (f) of this section.
- (1) After initial groundbreaking, operators shall conduct site inspections at least every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. These inspections shall be conducted by a qualified professional. During each inspection, the operator or designated agent shall record the following information:
 - (i) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
 - (ii) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

- (iii) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;
 - (iv) Inspect all sediment control practices and note the approximate degree of sediment accumulation as a percentage of the sediment storage volume (for example 10 percent, 20 percent, 50 percent, etc.). Record all sediment control practices in the site log book that have sediment accumulation of 50 percent or more; and
 - (v) Inspect all erosion and sediment control BMPs and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document in the site log book any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water.
- (2) Prior to filing of the Notice of Termination or the end of permit term, a final site erosion and sediment control inspection shall be conducted by the operator or designated agent. The inspector shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.
- (h) Stabilization. The operator shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instances:
- (1) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;
 - (2) Where construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within 21 days, temporary stabilization measures need not be initiated on that portion of the site.
 - (3) In arid areas (areas with an average annual rainfall of 0 to 10 inches), semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th

day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, the operator shall initiate stabilization measures as soon as practicable.

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

Option 2 is designed to apply to construction sites where 5 acres of land or more are disturbed.

3.3.3 Option 3

Option 3 is the “no regulation” option. Under this option, stormwater runoff from C&D activities continues to be managed in accordance with existing requirements. Where EPA is the permitting authority, this generally means that discharges associated with the construction projects disturbing at least 1 acre will be controlled in accordance with the CGP (or an individual EPA-issued permit, as appropriate). In states that are authorized to conduct their own NPDES programs, the state requirements will continue to apply. Under this option, there are no incremental compliance requirements and, similarly, no incremental compliance costs or benefits.

3.3.4 Option 4

Option 4 is a modification of Option 2 and also applies to sites where 5 acres of land or more are disturbed. As such, it is identical to Option 2 in all particulars, with the exception of the exclusion of the I&S requirements. It modifies the same section of the CFR, with the same intent to codify the provisions of the CGP. The following lists the requirements that apply under Option 4:

- Codify provisions of the EPA CGP
- Prepare a SWPPP prior to groundbreaking
 - Description and schedule of construction activity
 - Site map indicating drainage patterns, area, locations of controls, surface waters, discharge points, BMP descriptions, etc.

- Install sediment basins or equivalent controls for common drainage locations of 10 or more acres, where attainable, designed to store runoff from the 2-year, 24-hour storm or 3,600 ft³/acre
- Install smaller sediment basins and/or sediment traps for common drainage areas of between 5 and 10 acres
- Where neither sediment basins nor equivalent controls are attainable, install other controls such as silt fences or vegetated buffer strips
- Stabilize exposed soil areas within 14 days after construction activity has temporarily or permanently ceased except:
 - Arid and semi-arid areas
 - During droughts or seasonally arid conditions
 - Where precluded by snow and frozen ground
 - Where construction activity will resume within 14 days
- Conduct inspections at least every 7 calendar days OR every 14 days and following 0.5” or greater rainfall except:
 - Once a month if site is temporarily stabilized, during winter, during seasonal arid periods
 - Waiver available until one month before thawing conditions expected if project is located in area with extended frozen conditions and land disturbance has been suspended
- Implement pollution prevention measures to prevent contamination of stormwater with litter, construction chemicals, construction materials and construction debris and waste materials