United States Government Accountability Office

GAO

Report to Congressional Requesters

February 2005

STORM WATER POLLUTION

Information Needed on the Implications of Permitting Oil and Gas Construction Activities

GAO-05-240

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GAO Accountability·Integrity·Reliability

Highlights

Highlights of GAO-05-240, a report to congressional requesters

Why GAO Did This Study

To prevent pollutants from entering storm water runoff, the Clean Water Act's National Pollutant Discharge Elimination System Storm Water Program requires controls for construction activities that disturb land. Phase I of this program requires permitting for construction activities that disturb 5 acres or more, while Phase II requires permitting for activities disturbing between 1 and 5 acres. The Environmental Protection Agency (EPA) extended the Phase II compliance date for discharges associated with oil and gas construction activities until March 2005 to analyze the impact of Phase II on the oil and gas industry. GAO was asked to provide information about oil and gas construction activities—such as well drilling and pipeline construction—affected by Phase I and likely to be affected by Phase II, as well as Phase II's financial and environmental implications.

What GAO Recommends

GAO recommends that EPA's Administrator complete the agency's analysis of the Phase II program before making a final decision on its implementation.

In reviewing our draft report, EPA officials agreed with our recommendation. EPA subsequently proposed an extension for the Phase II deadline for small oil and gas activities until June 2006 to allow time to complete its analysis.

www.gao.gov/cgi-bin/getrpt?GAO-05-240.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

A small fraction of total oil and gas construction activities have been permitted under Phase I of EPA's storm water program. Phase I storm water permit data for three of the six largest oil and gas producing states—Louisiana, Oklahoma, and Texas—showed that 433 construction activities were permitted under Phase I over the most recent 12 months for which data were available. About 70 percent, 304 of the 433, were oil and gas pipeline activities, most of which were much larger than the 5 acre criterion under Phase I. About 17 percent, 72 of the 433, were drilling activities. In comparison, these three states reported drilling an average of about 10,000 wells for each of the past 3 years. Industry must decide whether to seek permit coverage, and it has sought to have its drilling activities permitted on few occasions because it has determined that most drilling activity involves distinct projects that disturb less than 5 acres each. In states we reviewed, there were few reported compliance problems associated with oil and gas construction activities.

While it appears that most oil and gas construction activities may have to be permitted under Phase II, the actual number of activities that could be affected is uncertain, and the financial and environmental implications are difficult to quantify. The oil and gas construction activities affected by the rule may lead to increased financial costs for the oil and gas industry and federal agencies implementing the rule. Many of the potential costs stem from meeting permit requirements to review the impact of construction activities on endangered species, although this impact would be site specific and difficult to quantify. Potentially offsetting these costs, the rule may lead to additional environmental protections that are difficult to quantify, such as decreased levels of sediment in water and benefits for endangered species and their habitat. After delaying implementation of this rule for oil and gas construction activities for 2 years to study the impact of Phase II, EPA is analyzing the impact but, as yet, has not quantified the number of activities affected or the potential financial and environmental implications.

Gas Well Construction Site in Wise County, Texas

Source: GAO.

Contents

Abbreviations

DOE	Department of Energy
EPA	Environmental Protection Agency
FWS	Fish and Wildlife Service
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
LADEQ	Louisiana Department of Environmental Quality

G A O
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, D.C. 20548

February 9, 2004

The Honorable James M. Jeffords
Ranking Minority Member
Committee on Environment and Public Works
United States Senate

The Honorable James L. Oberstar
Ranking Democratic Member
Committee on Transportation and Infrastructure
House of Representatives

Polluted storm water runoff can lead to U.S. surface water degradation. Runoff from sites where the ground has been disturbed—in particular, construction sites—can deposit sediment and other harmful pollutants into rivers, lakes, and streams. Sediment—the primary environmental concern associated with construction activities—clouds water, decreases photosynthetic activity; reduces the viability of aquatic plants and animals; and, ultimately, destroys organisms and their habitat. According to the Environmental Protection Agency (EPA), sediment runoff rates from cleared and graded construction sites are typically 10 to 20 times greater than those from agricultural lands and one-thousand to two-thousand times greater than those from forest lands.

Storm water discharges from certain construction activities, as well as from other defined industrial sources and municipal storm water sewer systems, are subject to the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) Storm Water Program. This program is designed to reduce the impact of storm water by requiring the implementation of controls designed to reduce harmful pollutants from being washed by storm water runoff into local water bodies. The NPDES program regulates a variety of municipal, industrial, and construction activities, such as oil and gas construction activities.[1] Oil and gas construction activity includes clearing, grading, and excavating[2] activities associated with oil and gas exploration and production, processing and treatment operations, and transmission facilities. These activities are often

[1]Some oil and gas industry groups are asserting in litigation that the Clean Water Act does not authorize EPA to regulate most oil and gas construction activities under the storm water program.

[2]40 C.F.R. § 122.26(b)(14)(x) and 40 C.F.R. § 122.26(b)(15).

associated with oil and gas well drilling and pipeline construction, as well as other oil and gas construction.

Phase I of this program, which became effective in 1990, regulates storm water discharges from construction activities that disturb 5 acres or more of land, as well as smaller construction activities that are part of a common plan of development that disturbs 5 acres or more.[3] Phase II of the storm water program applies to construction activity disturbing between 1 and 5 acres of land.[4] EPA published the Phase II rule in December 1999 and set a March 2003 compliance date for permit coverage for discharges from small construction sites. EPA had originally assumed that few oil and gas construction activities would be affected by Phase II; but subsequent to rule promulgation, EPA became aware that as many as thirty-thousand oil and gas sites per year might be affected. So that EPA could perform further analysis of key issues, including the likely impact of Phase II's permitting requirements on the oil and gas industry, EPA postponed the Phase II compliance date for storm water discharges from small oil and gas construction sites until March 10, 2005.

Both phases of the rule allow oil and gas companies to obtain storm water permit coverage for their discharges under a general permit. In many other environmental programs, regulated entities obtain individual permits tailored to site-specific conditions. Though oil and gas companies may obtain individual storm water discharge permits, they almost always elect to obtain coverage under an NPDES general permit that contains general conditions applicable to a large number of sites. To obtain coverage, companies file a Notice of Intent to be covered under a general permit. This generally informs the permitting authority—EPA or the state, depending on the type of entity and its location—of planned activities that might involve storm water discharges and requires the operator to develop a plan to manage storm water pollution caused by these activities. The operator must also evaluate other potential impacts, including whether the construction activity is likely to adversely affect endangered or threatened species or their habitats before seeking coverage under EPA's Construction General Permit.

[3]Phase I also regulates storm water discharges from medium and large municipal storm water sewer systems and other sources of industrial discharges.

[4]Phase II also regulates storm water discharges from small municipal storm sewer systems.

This report provides information about (1) oil and gas construction activities that have obtained permit coverage under Phase I and (2) oil and gas construction activities that are likely to be affected by Phase II and its financial and environmental implications.

To gather information about the oil and gas construction activities that have sought permit coverage under Phase I, we spoke to oil and gas industry associations representing both large and small companies, and government representatives, to get a national perspective on the number and types of sites affected. Because there is no centralized database that tracks nationwide oil and gas construction activities subject to Phase I, we reviewed the storm water permitting history of Louisiana, Oklahoma, and Texas—three of the nation's six largest oil and gas producing states. EPA administers the permitting process for oil- and gas-related projects in Oklahoma and Texas, while Louisiana administers the entire NPDES Storm Water Program for its state.[5] We reviewed EPA's and Louisiana's storm water databases and spoke with the administrators of these databases to assess the reliability of these data, which we found to be sufficiently reliable for our purposes. In addition, in order to gather information about the characteristics of oil and gas construction activities, we visited oil and gas construction sites in Louisiana, Oklahoma, and Texas. To obtain information about the number of oil and gas construction activities potentially affected by Phase II, we spoke with industry and government representatives. We discussed the financial and environmental implications of Phase II with storm water stakeholders, including representatives of various federal agencies, an environmental group, and oil and gas associations and member companies. A more detailed description of our scope and methodology is presented in appendix I. We conducted our review between August 2004 and January 2005 in accordance with generally accepted government auditing standards.

Results in Brief

A small fraction of total oil and gas construction activities have obtained permit coverage under Phase I of EPA's Storm Water Program. Although there is currently no centralized, nationwide storm water permit database, our review of Phase I storm water permit data for three of the six largest oil and gas producing states—Louisiana, Oklahoma, and Texas—identified 433

[5]Oklahoma and Texas administer the NPDES programs in their respective states for most nonoil- and nongas-related projects with EPA oversight of those activities. EPA oversees Louisiana's administration of its program.

oil and gas construction activities that obtained Phase I permit coverage in these states over the most recent 12 months. About 70 percent of these activities were oil and gas pipelines, which were generally much larger than the 5-acre threshold, while about 17 percent were drilling activities. In comparison, these three states reported drilling an average of over ten thousand wells for each of the past 3 years. Industry officials must decide whether they should seek permit coverage, and they have sought to have their drilling activities permitted on few occasions because they concluded that most drilling activity involved distinct projects that disturbed less than 5 acres each. Neither EPA nor state officials reported many compliance problems associated with oil and gas construction activities in states we reviewed, although actual compliance rates are not known.

EPA, industry and state officials believe that most oil and gas construction activities involve between 1 and 5 acres of land and will need permit coverage under Phase II of the NPDES Storm Water Program, although the actual number of activities this rule will affect is uncertain. Furthermore, the financial and environmental implications of implementing Phase II for oil and gas construction activities are difficult to quantify. The additional oil and gas construction activities affected by the rule may lead to increased financial costs to the oil and gas industry and to implementing federal agencies. Many of the potential costs that have been identified relate to EPA's permit requirements to review construction activities' impact on endangered species. However, this impact is site specific and difficult to quantify, given that not all sites will have to perform the same level of review. Potentially offsetting these costs, additional environmental protections may result from a greater number of oil and gas construction activities covered by Phase II, including decreased levels of sediment in water and benefits for endangered species and their habitat. Similar to the potential costs, potential environmental benefits are difficult to quantify. After delaying implementation of this rule for oil and gas construction activities for almost 2 years to study the impact of Phase II, EPA has not yet completed its analysis of the Phase II rule, quantified the number of activities affected, or determined the potential financial and environmental implications. We are recommending that EPA's Administrator complete the agency's analysis of the Phase II program before making a final decision on its implementation.

Background

According to EPA, polluted storm water runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies that do not meet water quality standards. Pollutants in storm water can

significantly impact the environmental quality of U.S. waters by destroying aquatic habitat and elevating pollutant concentrations and loadings. Storm water discharges from construction activities can increase pollutants and sediment amounts to levels above those found in undisturbed watersheds.

The NPDES Program was created in 1972 under the Clean Water Act to control water pollution from point sources—any discernible, confined, and discrete conveyance.[6] Though EPA has had authority since 1972 to regulate storm water discharges, it declined to require permits for most of these discharges for over 15 years. However, in 1987, Congress passed the Water Quality Act, which amended the Clean Water Act to require the regulation of storm water discharges.[7] Accordingly, EPA established the NPDES Storm Water Program, which requires certain municipal, industrial, and construction sources to obtain permit coverage for storm water discharges.

The storm water program was implemented in two phases:

1. Phase I, adopted in 1990, which applies to medium and large municipal separate storm sewer systems and 11 categories of industrial activity (including large construction activity disturbing 5 or more acres of land);[8] and

2. Phase II, adopted in 1999, which applies to small municipal separate storm sewer systems and small construction activity disturbing between 1 and 5 acres of land.[9]

The Phase II final rule was published on December 8, 1999, and required storm water dischargers to obtain permit coverage by March 10, 2003. When promulgated, EPA assumed that few, if any, oil and gas sites would be impacted by the construction component of the Phase II rule. Subsequent to rule promulgation, EPA decided to reevaluate how many oil and gas construction sites would be subject to the rule and postponed the deadline for seeking coverage to March 10, 2005, for oil and gas construction

[6]33 U.S.C. § 1342(p).

[7]33 U.S.C. § 1362(14).

[8]NPDES Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47,990 (Nov. 16, 1990).

[9]NPDES - Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. 68,722 (Dec. 8, 1999).

activities disturbing between 1 and 5 acres of land.[10] The postponement was designed to allow EPA enough time to analyze and better evaluate the impact of the permit requirements on the oil and gas industry and to reconsider how key elements of the Phase II regulations would apply to small oil and gas sites.[11]

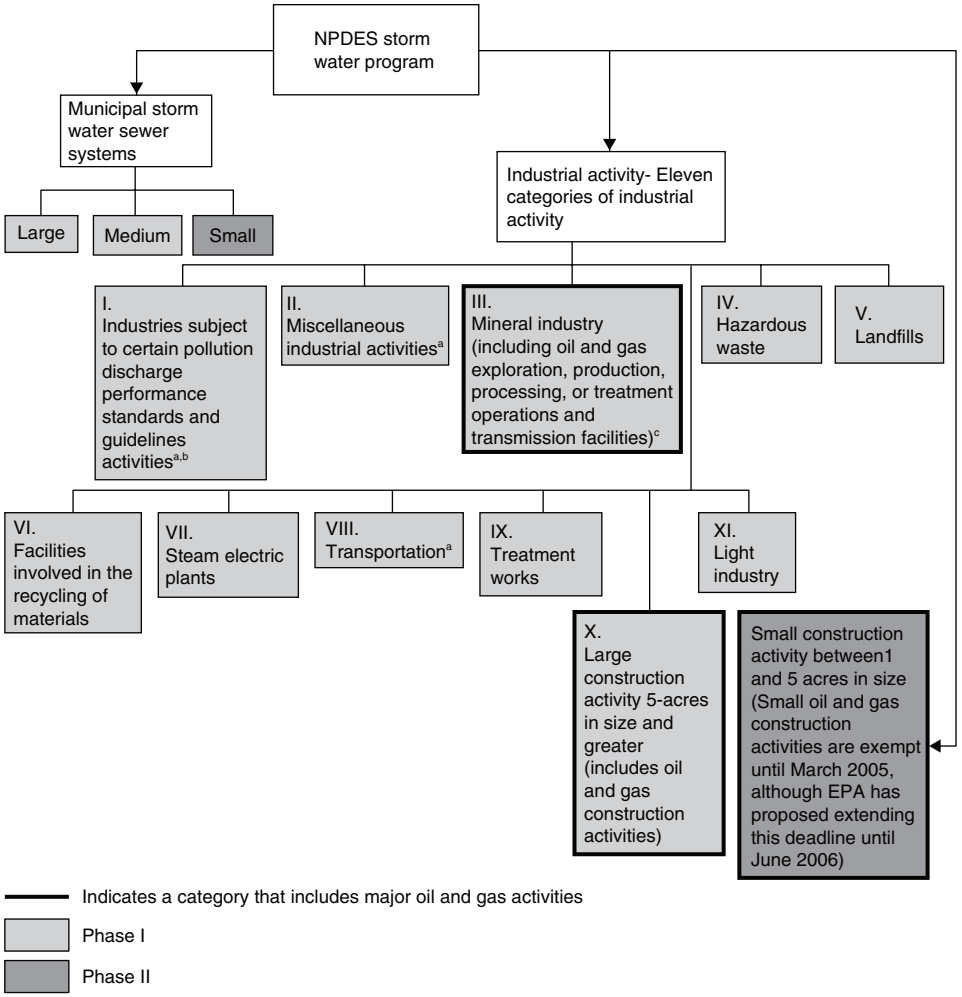
Analyzing the impact of storm water permitting on oil and gas construction activities is important because this type of construction requires companies to undertake a number of earth disturbing activities. These activities include clearing, grading, and excavating,[12] associated with oil and gas exploration and production; processing and treatment operations; and transmission facilities. For example, to prepare a site for drilling, operators must create a pad to support the drilling equipment, such as the derrick. Creating the pad generally requires clearing and grading—or leveling—an area and then placing rock, concrete, or other materials on it to stabilize the surface. If necessary, companies may also construct access roads to transport equipment and other materials to the site as well as additional pipelines to connect the site to existing pipelines. As with other construction activities, storm water runoff containing sediment from oil and gas construction can lead to the degradation of nearby waters if not properly managed. Figure 1 identifies activities, including oil and gas construction, covered under Phase I and II of the NPDES Storm Water Program.

[10]Modification of National Pollutant Discharge Elimination System (NPDES) Permit Deadline for Storm Water Discharges for Oil and Gas Construction Activity That Disturbs One to Five Acres of Land, 68 Fed. Reg. 11325-01.

[11]The NPDES Storm Water Program does not apply to storm water runoff from operational oil and gas sites, as long as the runoff does not come into contact with any raw material or product of any kind. Clean Water Act § 402(l)(2). EPA has asserted that Clean Water Act section 402(l)(2) does not bar EPA from regulating most storm water discharges from construction activities at oil and gas sites. Some industry groups disagree, asserting that section 402(l)(2) bars such regulations. The issue has been raised by industry in a case currently pending in the U.S. Court of Appeals for the Fifth Circuit. Tex. Indep. Producers and Royalty Owners Ass'n v. U.S. EPA, No. 03-60506 (filed Jun. 19, 2003).

[12]40 C.F.R. § 122.26(b)(14)(x) and 40 C.F.R. § 122.26(b)(14).

Figure 1: Activities Covered under Phase I and II of the NPDES Storm Water Program



Source: GAO analysis of EPA documentation.

[a]Industry categories I, II, and VIII also include some minor oil and gas activities: I includes petroleum refining, II includes petroleum products, and VIII includes bulk stations and terminals.

[b]Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 C.F.R. subchapter N.

[c]Oil and gas site operators must obtain storm water permit coverage if their storm water discharges come into contact with raw material or product of any kind.

NPDES storm water programs are administered at both the federal and state level. Under the Clean Water Act, states whose programs EPA has

approved may manage their state's programs. Forty-five states,[13] including Louisiana, are responsible for administering their own NPDES program, including its storm water component; and EPA is responsible for administering and enforcing the NPDES Storm Water Program in five states.[14] In addition, EPA is the NPDES storm water permitting authority for oil and gas activities in Oklahoma and Texas.

In many environmental programs, regulated entities obtain individual permits. In contrast, under the storm water program, regulated entities may seek coverage under a single document called a general permit. A general permit is issued by EPA or by the state environmental regulator and is available to all eligible operators in the EPA or state program.[15] With respect to regulated discharges of storm water associated with construction activity, EPA's general permit is called the Construction General Permit. Each general permit, whether it is issued by EPA or by a state program, sets forth many steps that regulated entities must take to ensure the minimization of storm water pollution.

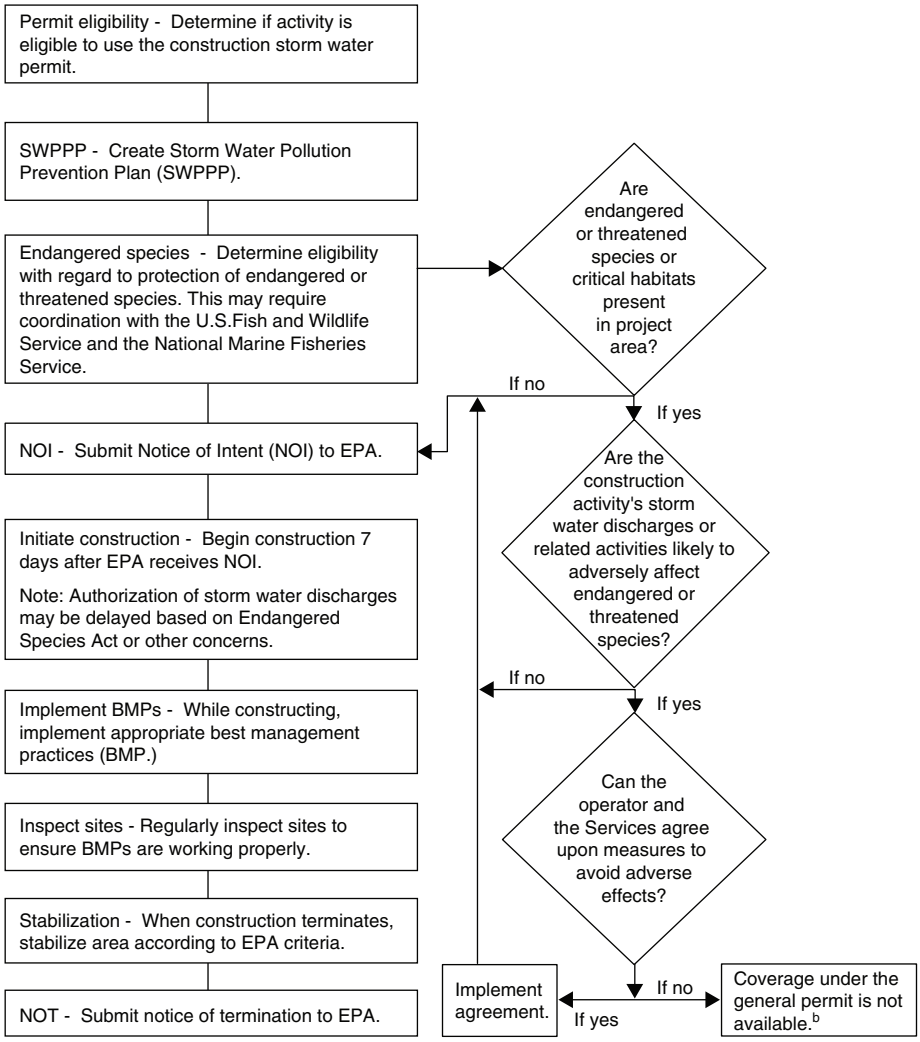
To obtain coverage under the EPA Construction General Permit, regulated entities must file a complete and accurate Notice of Intent to be covered under the general permit prior to initiating the construction activities. The Notice of Intent includes a signed certification statement from a company official acknowledging that the operator has met all eligibility conditions of the permit, including development and implementation of a plan to control the discharge of pollutants from the site. Examples of types of sediment and erosion controls that can be included in the plan consist of vegetative cover, rocks, and hay bales to filter storm water, or terracing slopes to divert and slow runoff. Figure 2 diagrams the steps that must be completed to obtain coverage under EPA's Construction General Permit.

[13]The Virgin Islands are also authorized to administer their own NPDES program.

[14]These five states include Alaska, Idaho, Massachusetts, New Hampshire, and New Mexico plus the District of Columbia and most U.S. Territories. EPA is also the permitting authority on all Indian lands and for federal facilities in Colorado, Delaware, Vermont, and Washington.

[15]Though states may implement the storm water program without issuing general permits, all states with a storm water program have authority to issue general permits. In addition, regulated entities may apply for individual storm water discharge permits (40 C.F.R. § 122.28(b)(3)(iii)); however, regulated entities typically apply for general permit coverage.

Figure 2: Steps to Obtain Coverage under EPA's Construction General Permit[a]



Source: GAO analysis of EPA documentation.

Note: Construction activities must comply with applicable state, tribal, and local provisions. Additionally, construction site operators must determine if their construction activity has the potential to discharge storm water into a water with a total maximum daily load (TMDL) established—a state limit required by the Clean Water Act on the amount of pollutants that may enter that body of water. If so, additional steps may be needed to ensure discharges from the site are consistent with any applicable limits established by the TMDL.

[a]State programs must have requirements that are at least as stringent as those in the EPA program. 40 C.F.R. § 123.25.

[b]Operators may submit an application for coverage under an individual permit.

One of the steps operators must complete when filing a Notice of Intent involves determining whether the construction activity meets the permit's eligibility conditions that address endangered species. The purpose of the Endangered Species Act is to conserve endangered and threatened species and the ecosystems upon which they depend. The act prohibits the "taking"[16] of any endangered fish or wildlife. Under the act and implementing regulations, federal agencies, including EPA, must determine whether their activities might affect a listed species or habitat identified as critical. If effects are likely, the agencies, including EPA, must consult with the Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS) to ensure that the activities, such as issuing permits, will not jeopardize a species' continued existence or adversely modify its designated critical habitat.[17]

In an effort to satisfy its responsibilities under the Endangered Species Act, EPA consulted with FWS and NMFS to create language for its Construction General Permit that requires operators to self-certify that they have examined their project's potential effects on endangered species. Specifically, language in appendix C of EPA's Construction General Permit sets out the procedures operators are to follow in meeting permit conditions that address endangered species for coverage under the permit. Briefly, the procedures in the permit require companies to

- determine if federally listed threatened or endangered species or their critical habitats are present on or near the project area,
- determine if the construction activity's storm water discharges or related activities are likely to affect any threatened or endangered species or designated critical habitat on or near the project area,
- determine if measures can be implemented to avoid adverse effects, and

[16]The term "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." 16 U.S.C. § 1532(15).

[17]FWS is the agency in the Department of the Interior to which the Secretary has delegated authority for implementing the Endangered Species Act for all terrestrial species as well as most aquatic, nonmarine species. Similarly, NMFS is the agency to which the Department of Commerce has delegated authority for protecting ocean-dwelling and anadromous species, such as salmon.

- if adverse effects are likely, work with FWS or NMFS to modify the project and/or take other actions to gain authorization for the activity.

Permit Coverage under Phase I Has Been Obtained by a Small Fraction of Total Oil and Gas Activities

A small fraction of total oil and gas construction activities have sought permit coverage under Phase I of EPA's storm water program. Industry and state officials we spoke with confirmed that few of their sites obtained permit coverage under the Phase I rule, since their activities rarely exceeded Phase I's 5-acre size threshold. However, EPA clarified that since industry decides whether to seek permit coverage for their oil and gas construction activities, the total number of activities for which permit coverage should have been obtained is unknown. EPA representatives told us they expect that pipeline projects are more likely to obtain permit coverage than individual drilling sites due to the higher visibility of pipelines, additional preconstruction approval processes under other laws, and the higher likelihood of pipeline construction being conducted by larger companies with more experienced legal and environmental staff.

Although there is currently no centralized storm water permit database that tracks storm water permit coverage nationwide, our review of Phase I storm water permit data for three major oil and gas producing states—Louisiana, Oklahoma, and Texas—confirmed that permit coverage has been obtained for only a small number of oil and gas construction activities, compared with the thousands of drilling activities occurring in those states.[18] Our review found 433 sites in Louisiana, Oklahoma, and Texas that have obtained construction storm water permit coverage for their oil and gas activities in the most recent 12-month period for which data were available. Table 1 shows the breakdown of permit coverage by state for the most recent 12 months that data were available.

[18]Storm water permit data reflects the number of sites that obtained permit coverage. It does not necessarily represent the number of sites that should have obtained coverage.

Table 1: Oil and Gas Activities for Which Storm Water Construction Permit Coverage Was Obtained, by State

State	Number obtaining permit coverage
Louisiana	22
Oklahoma	119
Texas	292
Total	**433**

Sources: Louisiana Department of Environmental Quality for Louisiana and EPA's Office of Water for Oklahoma and Texas.

Note: For Oklahoma and Texas, these data covered December 2003 through November 2004. For Louisiana, the data covered November 2003 to October 2004.

Further analysis of Phase I storm water permitting data showed that the principal activity for which oil and gas companies sought storm water permit coverage in these states was for pipeline construction. Three hundred four of the 433 activities for which permit coverage was obtained in the most recent 12-month period—about 70 percent—were for pipeline construction activities. Table 2 shows the breakdown of permit coverage by state and activity.

Table 2: Oil and Gas Activities for Which Storm Water Permit Coverage Was Obtained, by State and Construction Activity

	Construction activity			
State	Pipelines	Drilling	Other[a]	Total
Louisiana	12	2	8	**22**
Oklahoma	104	3	12	**119**
Texas	188	67	37	**292**
Total	**304**	**72**	**57**	**433**

Sources: Louisiana Department of Environmental Quality for Louisiana and EPA's Office of Water for Oklahoma and Texas.

[a]Other activities include the construction of refineries, compressor stations, tank batteries, etc.

Note: For Texas and Oklahoma, these data covered December 2003 through November 2004. For Louisiana, the data covered November 2003 to October 2004.

Fifty-four percent of the 304 pipeline activities in these states disturbed more than 10 acres of land. Eighty-seven pipeline activities—almost 30 percent of all the pipeline permittees—exceeded 20 acres in size.

Another key oil and gas construction activity in these states was oil and gas well drilling, with 72 of the 433 permits—about 17 percent—involving drilling activities. Fifty-six percent of these drilling activities disturbed between 5 and 8 acres of land. The drilling activities for which storm water permit coverage was sought represents a small portion of the total number of oil and gas drilling activities occurring in these three states. We reviewed onshore well completion data for Louisiana, Oklahoma, and Texas and found that between 2001 and 2003, an average of ten-thousand wells was completed each year.[19] Table 3 provides data on the number of wells completed in these three states between 2001 and 2003 and the average number of wells completed each year over the 3-year period.

Table 3: Onshore Well Completions from 2001–2003, by State

State	2001	2002	2003	Average per year
Louisiana[a]	877	556	699	711
Oklahoma	2,348	2,339	2,117	2,268
Texas	7,478	5,973	7,622	7,024
Total	**10,703**	**8,868**	**10,438**	**10,003**

Sources: Louisiana Office of Conservation, Oklahoma Corporation Commission, and Railroad Commission of Texas.

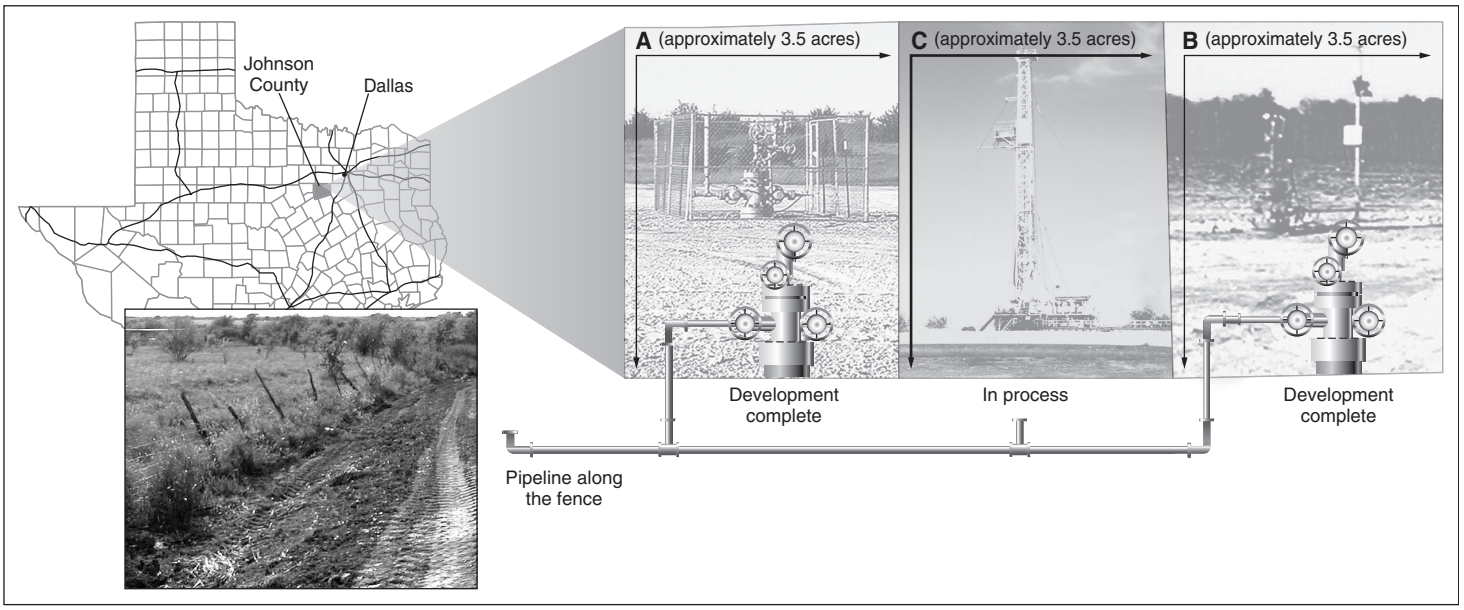
[a]Due to the structure of the Louisiana Office of Conservation's database, this figure may contain a small number of offshore wells.

Industry officials must decide whether or not they will apply for permit coverage, and some may have applied for storm water permit coverage on few occasions because they broke their construction activities—which taken together would exceed 5 acres—into what they believed were distinct projects that disturbed less than 5 acres each. During our site visit to a Texas gas construction location, we observed three drilling sites

[19]Operators typically file completion reports with state oil and gas agencies upon termination of drilling a well. Although the number of completion reports filed does not translate exactly to the number of construction activities subject to EPA's Phase I and II storm water rules, completion numbers do provide context for understanding the magnitude of oil and gas drilling activities occurring in different states. Depending on how a state manages its completion records, completion data may include modifications to wells that do not require significant amounts of construction and therefore may not be subject to EPA's storm water rules. Additionally, because completion data pertains to wells drilled, it does not reflect other construction activities, such as pipeline construction, that may be subject to the storm water rules.

situated adjacent to each other with an attached pipeline. Although the total acres disturbed by these activities exceeded 5 acres, industry officials did not believe these three sites needed permit coverage because each of the four activities—three drilling sites and a pipeline—was less than 5 acres, under construction at different times and stabilized prior to constructing the next activity. Figure 3 illustrates the layout of this area.

Figure 3: A Texas Gas Construction Location Including Three Adjacent Drilling Operations



Source: GAO.

Sites A, B, and C each disturbed approximately 3.5 acres of land and were connected by pipeline to an existing pipeline located about a mile from this site. According to industry officials, site A was financed, drilled, deemed a productive well, shut-in and the area stabilized prior to subsequent wells being drilled. The company did not decide to drill exploratory well B until A was identified as profitable. Once it drilled well B and found it to be profitable, the company drilled a well on site C between well A and B. Prior to well C being drilled, a different company agreed to construct a pipeline to connect this site with an existing pipeline. The industry officials estimated the pipeline disturbed less than 5 acres and said it was stabilized prior to starting construction on site C. The total acres disturbed by these sites exceeded 5 acres; individually the sites disturbed less than 5 acres of

land. Neither the drilling company nor the pipeline company constructing these activities obtained a permit under Phase I, although each of the four activities would require permitting under Phase II after the postponement period passes and small oil and gas sites are required to comply with the Phase II rules.

EPA's Phase I rule requires that activities disturbing 5 acres or more of land—as well as smaller construction activities that are part of a common plan of development that disturbs 5 acres or more—obtain permit coverage. EPA guidance defines a common plan of development as a contiguous area where multiple separate and distinct construction activities occur under a single plan. As this definition relates to oil and gas activities, EPA guidance considers lease roads, pipeline activities, and drilling pads to be a single "common" activity if they are under construction at the same time—provided there is an interconnecting road, pipeline or utility project, or if the activities are within one-fourth mile of each other. EPA headquarters officials said that the aforementioned example highlights a unique situation in which the definition of the common plan is difficult to interpret without more information from the site operator(s). They said that depending on the operator's reasons for drilling the second and third wells, permit coverage may or may not have been required in this example. Many oil and gas industry groups assert that EPA's definition of "common plan" is confusing and illegal because it does not adequately consider oil and gas industry practices. These oil and gas groups have raised the issue of EPA's definition of "common plan" in two lawsuits pending against EPA in federal courts.[20]

Although actual compliance rates in the field are unknown, neither EPA nor state officials reported many compliance problems associated with oil and gas construction activities that are 5 acres or more in size in Louisiana, Oklahoma, and Texas. Currently, EPA's Region 6—responsible for administering the Oklahoma and Texas storm water programs for oil and gas activities—has not completed any enforcement actions against oil and gas construction companies for violations of the storm water program, although it currently has one enforcement action under way. Region 6 enforcement officials told us they primarily depend on citizen complaints

[20]Wisc. Builders Ass'n v. U.S. EPA, No. 03-2908 (7th Cir. filed Jul. 16, 2003); Tex. Indep. Producers and Royalty Owners Ass'n v. U.S. EPA, No. 03-60506 (5th Cir. filed Jun. 19, 2003). Among the industry groups' assertions is that EPA's definition of "common plan" fails to adequately consider oil and gas industry practices: according to the industry groups, drillers do not know at the onset of drilling activity how much land they will ultimately disturb.

and state referrals to identify oil and gas construction activities that may adversely impact water quality. Similar to EPA Region 6's program, the Louisiana Department of Environmental Quality's (LADEQ) construction storm water inspections are complaint driven. A Louisiana inspections representative whom we spoke with said that due to the traditionally short time frames for completing oil and gas construction activities, LADEQ found including these activities in the state's annual compliance monitoring strategy to be impractical. As a result, the state relies on citizen complaints and routine surveillance to provide cause for conducting storm water inspections of construction activities. Although LADEQ does not track storm water enforcement actions for oil and gas construction separately from those of other types of construction activities, Louisiana officials with whom we spoke said they did not believe the state had carried out any storm water enforcement actions against oil and gas construction activities.

Most Oil and Gas Construction Activity Will Likely Be Affected by Phase II, but the Financial and Environmental Implications of Phase II Are Difficult to Quantify

EPA, industry and state government representatives agree that Phase II permit coverage will be required for most oil and gas construction activities, but the actual number of activities that will be affected by the rule is unknown. In addition, the financial and environmental implications of implementing Phase II for oil and gas construction activities are difficult to quantify. Phase II may lead to increased costs for federal agencies with a role in the storm water permitting process, as well as for members of the oil and gas industry who obtain permit coverage. However, Phase II may also lead to environmental benefits for local waters and endangered species and their habitats, even though these benefits are difficult to quantify. As EPA approaches the end of a 2-year period to study the impact of Phase II on oil and gas construction activities, EPA has not yet quantified the number of sites impacted or the financial and environmental implications of the Phase II rule's implementation.

Most Oil and Gas Construction Activities Will Likely Be Required to Obtain Storm Water Permit Coverage under Phase II, but the Actual Number of Activities That Will Be Affected by the Rule Is Unknown

EPA, industry and state government representatives agree that most oil and gas construction activities will disturb 1 acre or more of land and, as such, will have to obtain permit coverage under the Phase II rule. However, the precise number of oil and gas construction activities that will require storm water permit coverage under the Phase II rule is unknown, and estimating the specific number of sites that will be affected by Phase II is problematical because there is no data source that comprehensively identifies the disparate oil and gas construction activities subject to the rule and categorizes them by size. Industry representatives that we spoke with said most, if not all, of their oil and gas construction activities not covered by Phase I would be required to seek permit coverage under Phase II. These representatives said that their typical drilling construction site disturbs more than 1 acre but less than 5 acres of land. Similarly, representatives from the Oklahoma Corporation Commission and Railroad Commission of Texas indicated that almost all of the oil and gas well construction in their states would disturb over 1 acre of land and would have to obtain storm water permit coverage. Furthermore, EPA officials generally concurred that most oil and gas construction activities would need to obtain coverage, or seek a waiver, under Phase II. A company may receive an optional waiver from permit coverage in more arid areas where there is low rainfall. EPA officials told us that in arid areas, such as western Oklahoma and Texas, most operators could qualify for waivers with expeditious construction schedules and careful timing.

Phase II May Lead to Additional Costs that Are Difficult to Quantify

The Phase II rule may lead to additional costs for industry and federal agencies, but these costs are difficult to quantify. For example, the EPA Construction General Permit requires companies to implement erosion and sediment controls to minimize pollutants in storm water discharges, which will lead to additional costs for operators. Industry representatives we spoke with were less concerned with these particular costs, however, because they said that the oil and gas industry routinely takes similar preventative measures. These officials did express concerns about the costs associated with storm water inspections required by the permit. These inspections are designed to ensure companies properly implement practices to minimize storm water pollution and require that sites be inspected (1) at least once every 7 days or (2) at least once every 14 days and within 24 hours of certain storm events. Industry officials explained that oil and gas activities typically occur in remote, rural areas, which makes it costly for them to inspect sites as required by the permit. Furthermore, since sites may not always have personnel present, these

representatives said it can be difficult to determine when a storm event has occurred. EPA maintains that it has reduced the inspection burden by allowing less difficult pipeline inspections and authorizing monthly inspections under certain circumstances, such as when a site is temporarily stabilized or when winter conditions make runoff unlikely.

The Phase II storm water rule may also lead to additional costs for federal agencies and the oil and gas industry associated with the endangered species requirements of the storm water permit. The EPA Storm Water Construction General Permit provides coverage under the permit only if the storm water discharges are not likely to jeopardize the continued existence of any species that is listed as endangered or threatened, pursuant to the Endangered Species Act, or result in the adverse modification or destruction of critical habitat. Because companies seeking storm water permit coverage must evaluate the impact their construction activities might have on endangered species, the workload of agencies such as the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), which are the regulatory agencies for the Endangered Species Act, could increase if a significantly larger number of sites initiated communications or consultation requests. NMFS headquarters representatives and FWS field representatives we spoke with indicated that the increased workload from a greater number of Phase II consultation requests could exceed staff capabilities. However, they also said they were unsure what impact Phase II would have on their activities, because they did not know how many additional oil and gas construction sites would be affected by the rule.

Oil and gas industry representatives were most concerned about costs that stem from delays companies may face when identifying a construction activity's impact on endangered species. These representatives said that endangered species reviews are often extremely time intensive and require interactions with federal agencies that introduce delays into the construction process and lead to increased costs. Various forms of interactions with FWS and NMFS (the Services) may be used to ensure that provisions of the storm water permit concerning endangered species are met—including the more common informal consultations and less frequent

formal consultations.[21] Informal consultation can be used to determine whether an activity will adversely affect endangered or threatened species or critical habitat. If during informal consultation the action agency—in this case EPA—determines that no adverse impact is likely and FWS and NMFS agree, the consultation process is terminated with the written concurrence of the Services. Although there is no regulatory deadline for completing an informal consultation, the Services' policy is to respond to informal consultations about endangered species within 30 days. Formal consultations are necessary if an activity is likely to adversely affect a listed species. The Endangered Species Act requires most formal consultations to be conducted within 90 days. In addition, the implementing regulations require the Services to document in a biological opinion, within 45 days after the conclusion of the consultation, whether the activity is likely to jeopardize the listed species' continued existence or adversely modify its designated critical habitat. If necessary, the biological opinion may also provide reasonable and prudent alternatives that, if taken, would avoid jeopardizing a species or adversely modifying its critical habitat. However, the Services may postpone the start of any of these time frames until they have the best available information on which to base their opinions.

The total time needed to consult with the Services is difficult to quantify, given that not all sites will have to perform the same level of review and because not all construction activities occur in areas where endangered species are present. In a March 2004 report on the overall consultation process, we identified concerns from federal agencies and nonfederal entities about the time it takes to complete the consultative process. In one limited review that we conducted of 1,550 consultations, about 40 percent exceeded established time frames. However, we found that FWS and NMFS needed more complete and reliable information about the level of effort devoted to the process. Specifically, these time frames did not capture sometimes significant amounts of preconsultation time spent discussing a project before the consultation officially was considered to have begun.[22] Even without the requirements of EPA's Construction General Permit and

[21]The Endangered Species Act requires federal agencies such as EPA–not regulated entities such as individual construction site operators–to consult with the Services regarding endangered species. However, EPA's Construction General Permit requires applicants to self-certify that they have examined their project's potential effects on endangered species. In doing so, the Construction General Permit specifies that operators must satisfy certain criteria, two of which are entering into formal and informal consultations with the Services.

[22]U.S. GAO, *Endangered Species: More Federal Management Attention Is Needed to Improve the Consultation Process*, GAO-04-93 (Washington, D.C.: Mar. 19, 2004).

associated consultations under the Endangered Species Act, operators of oil and gas construction activities would still have to spend time complying with the act by ensuring that their activities do not result in a "take" of an endangered species.

Phase II May Lead to Additional Benefits that Are Difficult to Quantify

The Phase II storm water rule may lead to additional environmental benefits, although these benefits can be difficult to quantify. Officials from EPA's Office of Water indicated that while it is difficult to quantify all the benefits associated with the rule, the principal benefits are based on decreased quantities of sediment in water. These officials told us that excess amounts of sediment in water can affect aquatic habitat, water quality, waters' use as a source of drinking water and water supply reservoir capacity, navigation, and recreational activities. According to FWS officials, construction activities may affect listed species in both direct and indirect ways. Direct effects may include killing or injuring members of listed species. Indirect effects may include changing essential behavior patterns like feeding, breeding, or sheltering, as a result of modifications to the species' habitat. Additionally, the NMFS acknowledged that land disturbance activities that increase the amount of sediment in water and turbidity can indirectly influence endangered species' productivity and ultimately cause changes in migratory behavior, reduce prey abundance, reduce the survival and emergence of larvae, and contribute to increased temperatures and chemical pollutants that can cause habitat loss.

An environmental group representative we spoke with said that voluntary initiatives are not a viable method for resolving storm water pollution issues and that the permit process provides a mechanism for ensuring that practices to mitigate water pollution from construction activities are implemented. This representative also commented that EPA has not provided any evidence that the environmental consequences of oil and gas construction activities are different from those of other types of construction activities or that the oil and gas industry's controls are any better. Finally, this representative said that a single industry should not be exempted from regulations with which other industries must comply and added that the large number of oil and gas activities potentially subject to the rule shows the significant amount of environmental damage that could occur if these activities went unregulated. EPA is currently studying the environmental impact of oil and gas construction activities but has not completed its analysis.

Industry representatives, however, believe that the Phase II storm water rule provides only negligible environmental benefits and that the current system of regulation encourages environmentally friendly construction practices. For example, one industry representative stated that with only the Phase I rule in effect, companies have an incentive to keep construction activity to less than 5 acres—thus minimizing the land disturbance and associated environmental effects. If the Phase II rule were implemented as written, this representative maintained the industry would have no incentive to minimize the acreage used in order to keep the site under 5 acres.

EPA Has Not Completed Its Assessment of the Number of Oil and Gas Sites Impacted by Phase II or Its Financial and Environmental Implications

Almost 2 years after delaying the implementation of Phase II for oil and gas activities in order to study and evaluate the impact on the industry, EPA initiated an analysis of the rule but has not completed the study, quantified the number of activities affected, or determined its potential financial and environmental implications. In March 2003, EPA extended the deadline for operators to obtain Phase II permits for oil and gas activities in order to allow itself additional time to analyze and better evaluate the impact of the rule on the oil and gas industry. This 2-year extended deadline will expire on March 10, 2005. However, as we performed audit work for this engagement, EPA had not issued any analysis of the rule's impact; nor could EPA management representatives provide a specific estimate of when its analysis would be completed or when a final decision would be reached. We provided a draft of this report with our recommendation to EPA. Subsequently, on January 18, 2005, the agency proposed a further extension of the compliance date to June 12, 2006, to complete its review and take final action. Within 6 months of a final action on the January 18, 2005, proposal, EPA intends to propose rulemaking to address storm water discharges from oil and gas sites and invite public comment. Separate from EPA's efforts, oil and gas industry representatives informed us of a Department of Energy (DOE) study to evaluate the impact of the Phase II rule on the oil and gas industry. During our study, officials from DOE's Office of Fossil Energy told us that DOE's study was still in draft form. These officials would not provide an explanation of the purpose, costs, or estimated completion date of the study.[23]

[23]As we finalized our report, DOE completed and posted its economic analysis study on its Web site at http://www.fossil.energy.gov/programs/oilgas/publications/storm_water_analysis/Storm_Water_Analysis.html.

Conclusions

Our review indicated that it is probable that substantially more oil and gas activities will be impacted by Phase II of the NPDES storm water rule than by Phase I. Given that EPA has not been able to quantify the number of oil and gas activities required to obtain storm water permit coverage under either rule, it remains important that EPA identify the universe of oil and gas activities that would most likely be affected. This analysis would provide the necessary foundation for understanding the implications that the rule may have for the environment and the oil and gas industry and determine the overall effectiveness of the NPDES storm water program.

Recommendation for Executive Action

So that EPA may fully understand the implications of Phase II of its storm water rule prior to deciding whether the oil and gas industry should be subject to it, we recommend that EPA complete its Phase II analysis before making any final decision. Furthermore, as a part of this analysis, we recommend that EPA assess

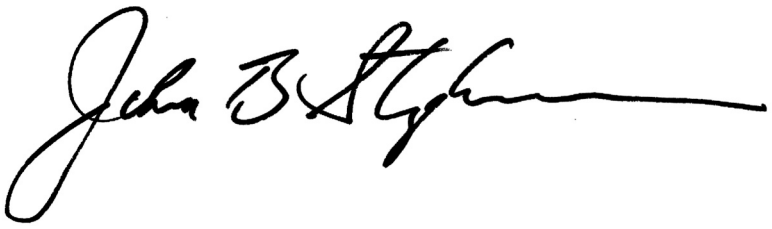
- the number of oil and gas sites impacted by the Phase II rule;
- the costs to industry of compliance with the rule and whether these costs are solely attributable to the storm water rule; and
- the environmental implications and benefits of the storm water rule, including, but not limited to, potential benefits for endangered species.

Agency Comments and Our Evaluation

We requested comments on a draft of this report from the Administrator of the Environmental Protection Agency (EPA). EPA provided oral comments and agreed with our findings and recommendation. In addition, EPA included technical and clarifying comments, which we included in our report as appropriate.

As agreed with your staffs, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of the report to the EPA Administrator and other interested parties. We will also provide copies to others on request. In addition, the report will be available at no charge at GAO's Web site at http://www.gao.gov.

Questions about this report should be directed to me at (202) 512-3841. Other key contributors to this report are listed in appendix II.



John Stephenson
Director, Natural Resources
and Environment

Objectives, Scope, and Methodology

This report provides information about (1) oil and gas construction activities for which permits have been obtained under Phase I and (2) oil and gas construction activities that are likely to be affected by Phase II and its financial and environmental implications.

To address the number of oil and gas activities for which permits have been obtained under Phase I, we limited our analysis to three of the top five natural gas producing states and three of the top six crude oil producing states in 2003, according to available data from the Energy Information Administration. We chose states with storm water programs implemented by both state and federal authorities. Louisiana's Department of Environmental Quality administers the National Pollutant Discharge Elimination System's Storm Water Program (NPDES) for its state, while Oklahoma's and Texas' storm water programs for oil and gas activities are administered by the Environmental Protection Agency's (EPA) Region 6. Additionally, Oklahoma and Texas are unique in that only the oil and gas portions of their storm water program are administered by EPA; the remainder of their storm water program is administered by the state.[1]

To determine the number of oil and gas construction activities requesting storm water permit coverage under Phase I in those three states and to get a national perspective on the number and types of sites affected, we spoke with oil and gas industry and government representatives. We also reviewed EPA's (for Oklahoma and Texas) and Louisiana's storm water database that contains information about Notices of Intent filed with the program authority to indicate a company's plan to begin a construction activity that disturbs 5 acres or more of land. We reviewed the most recent 12-month period of data available: EPA's information for Oklahoma and Texas from December 2003 to November 2004 and Louisiana's information from November 2003 to October 2004. Because the database contained more than just oil and gas construction information, we isolated data for those companies within the oil and gas industry and reviewed relevant characteristics of those Notices of Intent. While this data provides information about the number of companies that requested storm water permit coverage for their oil and gas construction activities, it does not indicate the universe of companies that should have filed. Furthermore, these data are not generalizible to the nation as a whole. We spoke with the administrator of this database to assess the reliability of this data and

[1]EPA also administers the storm water program for certain agricultural activities in Oklahoma.

found the data from 2003 and 2004 to be sufficiently reliable for our purposes. Additionally, to provide us with context for understanding how the number of drilling activities covered by Phase I compares with the total number of oil and gas drilling activities being carried out, we reviewed oil and gas well completion data from Louisiana, Oklahoma, and Texas. These data provided us with an additional perspective about the magnitude of oil and gas activities occurring in these states and proved sufficiently reliable for our purposes. We gathered these data from the Louisiana Office of Conservation, Oklahoma Corporation Commission, and Railroad Commission of Texas. In order to gather information about the characteristics of oil and gas construction activities, we visited oil and gas construction sites in Louisiana, Oklahoma, and Texas and viewed pollution control measures implemented in various terrains. In Louisiana and Texas, we were accompanied by industry representatives who were members of the Domestic Petroleum Council; in Oklahoma, we were accompanied by EPA and oil and gas industry representatives. Both EPA and industry officials provided perspectives on the choice of pollution control measures implemented. We spoke with the storm water enforcement coordinator for oil and gas activities in EPA's Region 6, as well as the state official responsible for storm water program permitting at the Louisiana Department of Environmental Quality. We discussed their respective storm water programs and strategies for enforcing the storm water regulations. When possible, their offices provided data about enforcement actions and inspections.

To determine the number of oil and gas activities that may be affected by Phase II and the financial and environmental implications of implementing Phase II for oil and gas construction activities, we spoke with storm water stakeholders, including the Natural Resources Defense Council. Finally, we spoke with oil and gas industry representatives, including the Domestic Petroleum Council, the American Petroleum Institute, and the International Petroleum Association of America and representatives from some of these organizations' members. These stakeholders offered contrasting views about the environmental benefits and economic costs of these regulations. We also reviewed written comments that environmental groups and oil and gas industry groups provided to EPA when the agency first proposed postponing the Phase II deadline for oil and gas activities.

To formulate a more thorough understanding of federal agencies with a role in implementing the Storm Water Program and level of interagency coordination, we spoke with U.S. Fish and Wildlife and National Marine Fisheries officials responsible for carrying out section 7 of the Endangered

Species Act, which requires federal cooperation to protect endangered species. Specifically, we spoke with representatives from the U.S. Fish and Wildlife Service's headquarters, Arlington, TX and Tulsa, OK offices, as well as with the National Marine Fisheries Service's headquarters and southeast regional offices.

We conducted our review between August 2004 and January 2005 in accordance with generally accepted government auditing standards.

GAO Contacts and Staff Acknowledgments

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