

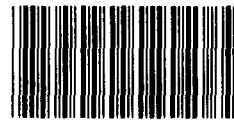
GAO

Report to the Chairman, Environment,  
Energy, and Natural Resources  
Subcommittee, Committee on  
Government Operations, House of  
Representatives

July 1991

# WATER POLLUTION

## Stronger Efforts Needed by EPA to Control Toxic Water Pollution



144453

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**Resources, Community, and  
Economic Development Division**

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July 19, 1991

The Honorable Mike Synar  
Chairman, Environment, Energy,  
and Natural Resources Subcommittee  
Committee on Government Operations  
House of Representatives

Dear Mr. Chairman:

As requested, we reviewed the Environmental Protection Agency's (EPA) and states' efforts to implement the Clean Water Act requirements for controlling toxic pollutants discharged into the nation's waters. Specifically, this report discusses (1) EPA's and states' efforts to identify waters impaired by toxic pollutants and to develop strategies to control discharges into these waters and (2) the extent to which existing water pollution control programs and activities comprehensively control all types and sources of toxic pollution. In addition, we reviewed innovative approaches EPA and states are using to address resource constraints hampering effective control of toxic discharges.

As arranged with your office, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to other appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to other interested parties.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111. Other major contributors to this report are listed in appendix III.

Sincerely yours,



J. Dexter Peach  
Assistant Comptroller General

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# Executive Summary

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## Purpose

While the quality of some of the nation's rivers, lakes, and streams has improved in recent years, many of these waters remain polluted by toxic pollutants such as heavy metals, pesticides, and organic chemicals. These toxic pollutants pose serious threats to aquatic life and may be linked to cancer and other human health problems.

As requested by the Chairman, Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, GAO assessed (1) how the Environmental Protection Agency (EPA) and states have implemented the Clean Water Act's requirement to identify and clean up waters impaired or threatened by toxic pollutants and (2) whether existing water pollution control programs and activities comprehensively control all types and sources of toxic pollutants being discharged into the nation's waters. In addition, GAO reviewed innovative approaches EPA and states are using to address resource constraints hampering effective control of toxic discharges.

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## Background

In 1972 the Clean Water Act established programs that control the amounts of harmful pollutants facilities can discharge directly into the nation's receiving waters and indirectly into these waters through sewage treatment plants. As a result of subsequent amendments, EPA developed a list of 126 "priority" toxic chemicals and promulgated national effluent guidelines to control toxic discharges from certain categories of industries.

The Water Quality Act of 1987, which amended the Clean Water Act, reaffirmed the Congress' interest in controlling toxic water pollution by requiring EPA and states to identify, on a one-time basis, waters impaired by toxic pollutants ("hotspots") and by nontoxic pollutants and to develop strategies to clean up these waters. Among its other provisions, this act established deadlines for identifying and cleaning up the impaired waters and implementing other key toxic pollution control requirements, including adoption of numeric toxic discharge limits.

Overall, EPA's and states' efforts to control toxic pollution generally involve four key functions: (1) monitoring water quality, (2) developing national effluent guidelines and criteria documents for setting toxic discharge limits, (3) incorporating toxic limits into states' water quality standards and/or discharge permits, and (4) having dischargers comply with, and EPA and states enforce, these limits. In addition, states have developed program plans to address nonpoint source pollution that

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comes from multiple sources such as mining, construction, and agricultural runoff.

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## Results in Brief

EPA and states did not identify many of the nation's impaired waters because most states have monitored only a minority of their waters. Also, less than 3 percent of the 18,770 impaired waters identified are targeted for more stringent regulatory controls or cleanup.

Some of the problems EPA and states encountered when trying to identify impaired waters are indicative of broader problems affecting their overall efforts to effectively control toxic pollution entering the nation's waters. For example, the same monitoring problems that hindered identification of impaired waters have also affected states' abilities to determine the full extent and sources of toxic pollution problems. In addition, the comprehensiveness of monitoring varies widely among states. GAO also found problems in the other three functions intended to control toxic pollution. Moreover, these functions primarily address pollution discharged from point sources such as municipal and industrial facilities; little attention is focused on controlling toxic pollution caused by nonpoint sources.

EPA and state officials attribute many of the problems affecting their efforts to effectively implement water pollution control programs to financial resource constraints. To respond to these problems, some states use alternative financing mechanisms, such as fees, to generate additional revenue to support their programs. Also, EPA and some states and industries have begun integrating prevention practices into their existing pollution control programs to prevent toxic discharges to surface waters. A number of barriers, however, currently impede wider use of both approaches.

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## Principal Findings

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### Few Impaired Waters Targeted for Cleanup

Many of the nation's impaired waters were not identified and targeted for cleanup as required by the Water Quality Act. First, most states have monitored the quality of less than half of their surface waters. For example, only 29 percent of the nation's total river miles has been monitored. Second, more stringent regulatory controls are required only for waters impaired by any of the 126 priority pollutants from point

sources—effectively ignoring impairments caused by nonpriority and conventional pollutants and nonpoint sources. These waters constitute only 529 of 18,770 impaired waters identified nationwide. Finally, cleanup strategies for these waters consist primarily of revised discharge permits that do not necessarily make pollution controls more stringent.

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### EPA and State Efforts to Control Toxic Pollution Are Not Comprehensive

Among the problems GAO found with EPA's and states' broader efforts to identify and control toxic water pollution were the following:

- **Monitoring.** Monitoring for toxic pollution is limited. Only one of the four states GAO visited routinely conducts ambient monitoring to test for toxic substances in its receiving waters, fish tissue, or sediment.
- **Setting Discharge Limits.** EPA has been slow to develop and revise national effluent guidelines (which include discharge limits) for categories of industries discharging toxic pollutants; many of the guidelines date back to the 1970s. Also, EPA has been slow to develop and revise criteria documents used to set individual discharge limits for toxic pollutants.
- **Incorporating Discharge Limits.** Few states have adopted numeric discharge limits for toxic pollutants in their water quality standards and, subsequently, discharge permits, because many believe that (1) EPA's criteria for setting such limits are often too stringent and (2) the scientific data and methodology used to set the limits are not legally defensible and are therefore open to legal challenges.

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### Alternative Financing and Prevention Strategies

Because resource constraints are the primary causes of problems affecting states' water pollution control programs, at least 30 states use alternative financing mechanisms to generate additional revenue for their programs. In many cases, however, the mechanisms generate only a small fraction of program needs. Also, revenues collected are sometimes returned to a general fund and therefore are not targeted for water pollution programs or activities. GAO found that some states are reluctant to use or rely more on these mechanisms, in part because they fear the added cost of pollution control will result in industries' moving to states without such mechanisms.

Even after actions are taken to correct problems identified in existing pollution control programs, there are limits to how effectively these programs can address toxic water pollution. For instance, some toxic pollution problems can be remedied only at enormous expense, and some

hazardous chemicals cannot be effectively removed from receiving waters at any price. Accordingly, EPA and a few states and industries have begun emphasizing prevention as an alternative to correcting pollution problems. Here, too, a number of barriers currently hinder greater use of prevention practices, including state officials' reluctance to encourage or require industries to adopt prevention strategies. GAO believes that a national pollutant-based fee system, similar to the one recently authorized by the Clean Air Act, could help raise additional revenue to support water pollution programs while also encouraging industries to reduce or eliminate their toxic discharges.

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## Recommendations

GAO recommends that the Administrator, EPA, accelerate the development and revision of national effluent guidelines and criteria documents. Other recommendations to improve EPA's and states' toxic water pollution control efforts are included in chapter 3.

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## Matter for Congressional Consideration

In light of existing resource constraints and barriers hindering greater use of innovative approaches to financing water pollution programs and preventing toxic discharges to the nation's waters, the Congress may wish to consider directing EPA to develop a pollutant-based fee system that would (1) generate additional revenue for water pollution control programs and (2) serve as an incentive for dischargers to use pollution prevention techniques to reduce or eliminate their toxic discharges.

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## Agency Comments

GAO discussed the contents of this report with EPA officials, who generally agreed with the information presented. Their comments have been incorporated where appropriate. However, as agreed, GAO did not obtain official EPA comments on a draft of this report.

# Contents

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<b>Executive Summary</b>		2
<hr/>		
<b>Chapter 1</b>		8
<b>Introduction</b>	Sources of Toxic Water Pollution	9
	Evolution of Regulatory Requirements for Controlling Toxic Pollution	9
	Existing Toxic Pollution Control Programs and Functions	12
	Objectives, Scope, and Methodology	13
<hr/>		
<b>Chapter 2</b>		16
<b>Few Impaired Waters Are Targeted for More Stringent Regulation</b>	Water Quality Act Required Identification of Impaired Waters	16
	Priority Pollutant List Is Not All-Inclusive	17
	Insufficient Monitoring Done to Identify Impaired Waters	17
	Other Reasons Why Impaired Waters Were Not Listed	18
	Few Listed Waters Are Targeted for More Stringent Regulation	19
	Conclusions	20
<hr/>		
<b>Chapter 3</b>		21
<b>Existing Water Pollution Programs Are Not Effectively Controlling Toxic Pollution</b>	States Do Limited Monitoring to Identify Extent and Sources of Toxic Pollution Problems	21
	National Standards Control Only a Limited Number of Toxic Discharges	27
	States Have Few Numeric Limits in Their Water Quality Standards and Discharge Permits	29
	More Stringent Toxic Requirements May Increase Noncompliance and Enforcement Problems	32
	Conclusions	34
	Recommendations to the Administrator, EPA	34
<hr/>		
<b>Chapter 4</b>		36
<b>Innovative Approaches Are Needed to Finance Water Pollution Programs and Prevent Toxic Discharges</b>	Alternative Funding Sources Are Needed to Support Pollution Control Activities	36
	Pollution Prevention as an Alternative to Controlling Toxic Water Pollution	41
	Encouraging Greater Use of Alternative Financing Mechanisms and Prevention Practices	46
	Conclusions	47
	Matter for Consideration by the Congress	48



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**Appendixes**

Appendix I: National Summary of Identified Impaired Waters by State (as of March 31, 1991)	50
Appendix II: Industrial Categories Covered by National Effluent Guidelines	52
Appendix III: Major Contributors to This Report	53

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**Figures**

Figure 3.1: Status of States' River Quality Assessments	24
Figure 3.2: Status of States' Lake Quality Assessments	24

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**Abbreviations**

AFM	alternative financing mechanism
CWA	Clean Water Act
EPA	Environmental Protection Agency
ICS	individual control strategy
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
PCBs	polychlorinated biphenyls
POTW	publicly owned treatment works

# Introduction

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While the quality of our nation's rivers, lakes, and streams has improved significantly in recent years, many of these surface waters still remain severely polluted. Currently, one of the most serious water quality problems results from excessive levels of toxic pollutants getting into these waters. The Environmental Protection Agency (EPA) estimates that 554.7 million pounds of toxic pollutants were discharged to surface waters in 1987.

Toxic pollutants pose serious threats to people and aquatic life that consume fish or swim in the polluted waters. Specifically, they can cause immediate short-term human health effects such as respiratory irritation, as well as long-term and permanent health problems such as cancer, kidney and liver damage, anemia, and heart failure. Toxic pollutants can also cause tumors or reproductive problems in fish, and genetic defects in shellfish and wildlife living in the toxic-infested waters. Some of the adverse impacts of toxic pollutants may appear only after long-term exposure to the harmful substances.

In addition to adverse impacts on human health and aquatic life, there may be significant economic damages associated with toxic water pollution. According to EPA, toxic discharges to surface waters cause losses of approximately \$800 million per year in recreational fishing, swimming, and boating opportunities.

Toxic pollutants generally include organic chemicals (such as solvents, dioxins, and PCBs), metals (such as mercury, lead, copper, chromium, and cadmium), and pesticides. Because toxic pollutants are less visible than conventional pollutants,<sup>1</sup> they are more difficult to identify and control. Also, limited data are available on the complex interactions of these pollutants once they get into waterbodies. Currently, over 65,000 chemical substances are manufactured or processed in this country; over 1,000 new substances are introduced each year. Many of these chemical substances can be harmful even at low concentration levels.

Cleaning up toxic water pollution nationwide can be enormously expensive. For example, we reported in August 1988 that it will cost at least \$1.8 billion to clean up Michigan's Rouge River,<sup>2</sup> which is one of 42 surface water areas in the Great Lakes Basin impaired or likely to be impaired by toxic chemicals.

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<sup>1</sup>Conventional pollutants include hydrocarbons, fats, acids, bacteria, and organic wastes.

<sup>2</sup>Water Pollution: Efforts to Clean Up Michigan's Rouge River (GAO/RCED-88-164, Aug. 10, 1988).

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## Sources of Toxic Water Pollution

Toxic pollutants get into the nation's waters from both point and nonpoint sources. Point sources include discrete and identifiable sources such as municipal and industrial facilities that discharge their wastewaters directly to surface waters. Municipal wastewaters generally consist of domestic wastes or toxic substances used in the home and in manufacturing and commercial businesses. These toxic substances may include motor oil, paint, household cleaners, and pesticides. Industrial wastewaters frequently include toxic metals and organic chemicals.

Unlike pollution from point sources, nonpoint pollution comes from multiple, diffuse sources. These sources include runoff from urban and agricultural areas; mining, construction, and hazardous waste sites; and air emissions that later settle into receiving waters. Runoff may contain heavy metals, organic chemicals, acids, crankcase oil and gasoline, pesticides, and other harmful toxic substances. Because nonpoint pollution is generated from several sources, it is more difficult to identify which water quality problems are caused by which nonpoint sources.<sup>3</sup>

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## Evolution of Regulatory Requirements for Controlling Toxic Pollution

During the past 2 decades, the Congress has enacted several pieces of legislation to address its increasing concerns about the quality of our nation's waters and problems caused by toxic pollutants. These laws have served as building blocks for a regulatory framework for controlling all types of pollutants—conventional, nonconventional, and toxic—discharged from point and nonpoint sources.

Before 1972, EPA and states used a “water quality-based” approach to controlling water pollution. Under this approach, states developed water quality standards that defined the required levels of cleanliness for all their surface waters to support designated uses. States currently are required to review and, where necessary, revise their water quality standards at least once every 3 years.

Under the water quality approach, states were to consider pollution from point and nonpoint sources. Also, if water quality standards for a particular waterbody were being violated, individual dischargers could be directed to reduce the amounts of their pollutant discharges. Before 1972 this approach was difficult to implement because neither EPA nor states had the scientific data and technical expertise to determine how much pollution each discharger along a specific surface water segment

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<sup>3</sup>For additional information on nonpoint source pollution, see Water Pollution: Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution (GAO/RCED-91-10, Oct. 15, 1990).

could release to prevent pollution problems. The lack of enforceable discharge permit limits also was a major constraint.

In 1972 the Congress enacted the Federal Water Pollution Control Act Amendments, commonly referred to as the Clean Water Act (CWA), which established specific goals and objectives for eliminating or reducing the amounts of pollution being discharged to the nation's waters. To achieve these objectives, the law directed EPA and states to use a "technology-based" approach in addition to the water quality-based approach to control discharges from point sources. Specifically, all point source dischargers were required to adhere to minimum technology-based standards before discharging wastes directly to surface waters or indirectly to these water through publicly owned treatment works (POTW). These standards, which are referred to as pretreatment standards and effluent guidelines, are implemented through the National Pretreatment and National Pollutant Discharge Elimination System (NPDES) programs.

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### Increased Emphasis on Controlling Toxic Pollutants

In 1977 the Congress amended the CWA to provide additional water pollution control requirements, but it also placed greater emphasis on regulating toxic and nonconventional pollutants. As a result of the 1977 and subsequent amendments, EPA developed a list of 126 "priority" toxic chemicals and promulgated national effluent guidelines to control toxic discharges from certain categories of industries.

In 1987 the Congress enacted additional pollution control requirements as part of the Water Quality Act, which amended the CWA. This law also required EPA and states to continue using a combination of the water quality- and technology-based approaches to control toxic discharges to surface waters. It also reemphasized the Congress' intent to control toxic water pollution by establishing deadlines for EPA and state actions to address toxic pollution from point and nonpoint sources.

One of the most notable requirements of the Water Quality Act, which added a new section 304(i) to the CWA, directed states to develop, by February 4, 1989, lists of their "impaired" waters. These are waters that do not meet or are not expected to meet established water quality standards, even after technology-based controls have been implemented, because of excessive levels of conventional, nonconventional, and/or

toxic pollutants discharged by point and nonpoint sources.<sup>4</sup> States were also required to identify point source facilities causing pollution problems and to develop strategies, by February 4, 1989, to control toxic discharges into the impaired waters. The listing of impaired waters was a one-time requirement.

In addition to identifying impaired waters, the CWA, as amended, required the following:

- States were to adopt numeric criteria as part of their water quality standards for all priority pollutants (for which EPA had published criteria documents), the discharge or presence of which could reasonably be expected to interfere with designated uses.<sup>5</sup> Where such numeric criteria were not available, states were to adopt criteria based on EPA's biological monitoring or assessment methods. States were required to adopt the criteria by February 4, 1990. (Section 303(c))
- States were to assess the extent to which nonpoint sources caused water quality problems and develop programs for addressing these problems. Also, states were required to submit their assessment reports and management program plans to EPA by August 4, 1988. (Section 319)
- EPA was to review and approve or disapprove states' lists of impaired waters, control strategies, water quality standards, and nonpoint source assessments and management program plans.
- EPA was to publish by February 4, 1988, and every 2 years thereafter, a schedule for the annual review and revision of existing effluent guidelines.<sup>6</sup> EPA must also identify categories of industries discharging toxic and nonconventional pollutants for which guidelines have not been published and establish a schedule for promulgating guidelines for these industries. (Section 304(m))

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<sup>4</sup>Nonconventional pollutants are any chemical substances, such as nitrogen and phosphorus, that are not classified as "conventional" or "toxic."

<sup>5</sup>Unlike narrative criteria, which are expressed in states' water quality standards in general terms, such as "free from toxic pollutants in toxic amounts," numeric criteria are expressed as concentrations of chemicals necessary to protect designated uses.

<sup>6</sup>These guidelines include limits on the amounts of specific pollutants that may be discharged into publicly owned treatment works (POTW) and directly into surface waters. Among other things, these limits are based on best available treatment technologies that are economically achievable.

## Existing Toxic Pollution Control Programs and Functions

EPA and states currently identify and control toxic discharges entering surface waters as part of existing water quality-based and technology-based pollution programs. These programs primarily include the surface water quality monitoring and standards, effluent guidelines, National Pretreatment, NPDES, and nonpoint source programs. EPA's and states' efforts to implement these programs generally involve four key functions: (1) monitoring surface water quality; (2) developing national effluent guidelines for certain categories of industries and criteria documents for setting individual toxic discharge limits for the priority pollutants; (3) incorporating toxic limits into discharger permits or state water quality standards; and (4) having dischargers comply with, and EPA and states enforce, established toxic discharge limits. EPA and states share responsibility for performing most of these functions.

Monitoring. States have primary responsibility for monitoring their surface waters to determine whether these waters meet established water quality standards for designated uses. When conducting monitoring activities, states use a variety of methods and procedures to assess water quality and to identify the extent and sources of toxic pollution problems. EPA assists states by developing regulations and guidance for establishing appropriate monitoring methods and procedures. EPA also provides technical assistance, whenever necessary, to develop the methods and procedures.

Developing discharge limits. To control the amounts of pollutants entering and adversely affecting waterbodies, EPA and states establish pollutant limitations for industrial and municipal dischargers. To do this, EPA and state officials may use technology-based limits, water quality-based limits, or a combination of the two. Technology-based limits define a minimum level of control and are imposed at the point of discharge or "end-of-pipe." These limits are established using (1) national effluent guidelines that contain consistent discharge limits for categories of industries discharging pollution into POTWs or directly to receiving waters or (2) permit writers' best professional judgment.

Water quality-based limits are usually more stringent than technology-based limits and are established to achieve or ensure the designated use of a particular waterbody is maintained. To establish these limits, EPA and state officials may use either (1) EPA's criteria documents to set specific discharge limits for the priority pollutants and other pollutants and/or (2) criteria established by state officials on the basis of their own analyses of receiving waters.

Incorporating limits. Once appropriate technology-based or water quality-based toxic limits are determined, EPA or state officials incorporate them, along with other requirements, into facilities' NPDES permits or pretreatment agreements. Under the NPDES program, all facilities must obtain a permit to discharge their wastes directly to the nation's waters. These permits are the principal tools EPA and states use to control toxic pollution entering surface waters. Under the pretreatment program, facilities discharging into POTWS must "pretreat" their wastes to prevent passage of harmful toxic pollutants through the POTWS and to surface waters. EPA, states, or local authorities set limits on the amounts of pollutants facilities can discharge to the POTWS.

Complying with and enforcing limits. When EPA or states incorporate toxic limits into discharge permits, the limits are legally enforceable. States and, in some cases, EPA review compliance with established limits through monitoring reports submitted by the facilities and by periodically sampling dischargers' wastewaters. If violations are detected, either EPA or states can take enforcement actions against violators.

As required by the CWA, states must also assess the extent to which nonpoint sources cause water quality problems and develop program plans for addressing these problems. EPA is charged with reviewing and approving the assessment reports and program plans. Control of toxic pollution through this program largely relies on voluntary implementation of best management practices, such as land use controls and restrictions, rather than on enforceable regulatory tools, such as permits.

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## Objectives, Scope, and Methodology

Citing growing concerns about toxic water pollution, the Chairman, Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, asked us to review EPA's and states' efforts to implement key requirements of the Clean Water Act to identify and control toxic pollutants discharged to the nation's waters. On the basis of subsequent discussions with the Chairman's office, we agreed to review

- EPA's and states' efforts to identify "toxic hotspots," i.e., waters impaired by toxic pollutants, and implement other key requirements of the Clean Water Act, as amended by the Water Quality Act of 1987, and
- the extent to which existing water pollution control programs and activities comprehensively control all types and sources of toxic pollutants discharged to the nation's waters.

In addition, we reviewed (1) innovative approaches EPA and states are using to address resource constraints that hamper effective implementation of existing water pollution control programs and activities and (2) barriers inhibiting greater use of these approaches.

We performed our audit work at EPA headquarters in Washington, D.C., and four EPA regional offices—Region I in Boston, Region III in Philadelphia, Region IV in Atlanta, and Region V in Chicago. We also visited state water program officials in Georgia, Massachusetts, Michigan, and Pennsylvania. In addition, we contacted representatives of environmental and public interest groups, such as the Natural Resources Defense Council, the Association of State and Interstate Water Pollution Control Administrators, the Chesapeake Bay Foundation, and the Water Pollution Control Federation.

To accomplish the first objective, we interviewed and obtained data from officials responsible for identifying impaired waters at EPA headquarters and regional offices and at state water program offices. Specifically, we gathered information on the criteria and data used to identify and list impaired waters and to prepare required control strategies. Also, we reviewed pertinent EPA regulations, guidance, and other relevant documents, as well as state guidance for implementing the CWA requirements. We also discussed with EPA officials the criteria and/or rationale used to approve and/or disapprove states' lists and strategies.

To address the second objective, we interviewed EPA and state water program officials and reviewed pertinent regulations, policies, procedures, and guidance documents to understand how existing water pollution programs are designed to control all types and sources of toxic pollution that enter the nation's surface waters. In doing so, we focused attention on EPA's and states' pollution control efforts as they related to the four key functional areas—monitoring water quality; developing national effluent guidelines for categories of industries and criteria documents for setting individual toxic discharge limits; incorporating toxic limits into discharger permits and state water quality standards; and having dischargers' comply with, and EPA and states enforce, established toxic limits.

To obtain information on innovative approaches to address resource constraints, we reviewed the results of studies conducted by EPA and the National Governors' Association to obtain information on (1) projected impacts of the toxic control requirements specified by the 1987 amendments on states and (2) financing alternatives that some states use to



generate additional resources for their water pollution programs. We discussed the projected impacts and use of financing alternatives with officials at EPA headquarters, regional offices, and state offices. We also obtained information from EPA and state officials about their efforts and those of permitted facilities to prevent toxic discharges. Through discussions with the officials, we identified barriers currently hindering greater use of financing alternatives and prevention techniques and potential solutions to overcome the barriers.

Finally, we reviewed the Office of Water's Financial Integrity Act reports for fiscal years 1987 through 1989.<sup>7</sup> The reports did not identify material weaknesses in EPA's surface water quality program specifically related to toxic water pollution control; however, they cited internal control weaknesses in the pretreatment and NPDES programs.

Our work was conducted from January 1990 through April 1991 in accordance with generally accepted government auditing standards. We discussed our audit findings with EPA officials responsible for implementing and enforcing surface water quality program requirements and incorporated their comments where appropriate. However, as agreed, we did not obtain formal comments from EPA officials on a draft of this report.

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<sup>7</sup>The Federal Managers' Financial Integrity Act requires federal agencies to report "material weaknesses" in their operating programs to the President and the Congress. As part of this requirement, offices within EPA—in this case, the Office of Water—first report issues they deem material or internal control weaknesses to EPA's Office of Administration and Resources Management.

# Few Impaired Waters Are Targeted for More Stringent Regulation

Section 304(1) of the Clean Water Act requires EPA and states, on a one-time basis, to identify waters impaired or threatened by toxic and non-toxic pollutants from point and nonpoint sources and develop individual control strategies (ICS) to clean up the impaired waters by June 1992. However, as implemented by EPA and states, only a small percentage of the nation's impaired waters are targeted for more stringent regulatory controls or cleanup. Among the reasons are the following:

- EPA and state efforts primarily focus on waters impaired by any of the 126 priority pollutants discharged from point sources.
- EPA and states were unable to identify all impaired waters because most states have assessed the quality of less than half of their surface waters.
- EPA required that ICSS be developed only for those waters impaired by point sources discharging any of the 126 priority pollutants.

## Water Quality Act Required Identification of Impaired Waters

The Water Quality Act requires EPA and states to identify impaired waters on three lists, which became known as the long, medium, and short lists:

- The long list was to be the most comprehensive and include waters impaired by point and/or nonpoint source discharges of toxic, conventional, and/or nonconventional pollutants. This list includes 18,770 waters nationwide.
- The medium list, which is a subset of the long list, was to include waters impaired by point and/or nonpoint source discharges of any of the 126 priority pollutants.<sup>1</sup>
- The short list, which is also a subset of the long list, was to include waters whose impairment was due entirely or substantially to point source discharges of any of the 126 priority pollutants. These waters are commonly referred to as "toxic hotspots." This list includes 529 impaired waters and 686 facilities.

EPA regulations only required states to identify and list point sources discharging priority pollutants to waters included on the short list. By definition, this list excludes waters that may be impaired by conventional or nonpriority toxic pollutants or by unidentifiable point sources and nonpoint source discharges.

<sup>1</sup>We could not determine the number of waters included on this list because EPA did not compile these national data.

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## Priority Pollutant List Is Not All-Inclusive

EPA and state officials said that the priority pollutant list does not include all of the most harmful toxic pollutants causing surface water quality problems, even though it includes some of the most common pollutants. According to EPA and the Natural Resources Defense Council (NRDC), this list was intended to initially identify some of the most common and harmful pollutants; it was not to be considered a final or an all-inclusive list.

Some state officials believe that nonpriority toxic pollutants are causing serious water quality problems. For example, the Commissioner of the Connecticut Department of Environmental Protection testified in June 1989 before the Senate Committee on the Environment and Public Works that nonpriority pollutants were causing many of the state's most serious pollution problems. The Commissioner noted that many of the 54 point source discharges Connecticut identified as causing toxic effects on aquatic organisms were not priority pollutants. The toxicity problems in many cases were caused by chlorine and other chemicals. The Commissioner further stated that EPA guidance and regulations overemphasize regulating priority pollutants to achieve water quality goals. Water program officials in at least three of the states we visited agreed that priority pollutants are not causing all of their water pollution problems.

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## Insufficient Monitoring Done to Identify Impaired Waters

Many EPA regional and state water program officials we visited acknowledged that they probably did not identify all of their impaired waters because they had limited data available for identification purposes. In addition, impaired waters were not always identified because most states have (1) assessed the quality of less than half of their total surface water miles, (2) traditionally focused their limited monitoring efforts on conventional rather than toxic pollutants, and (3) generated very little data on nonpoint source discharges, which are considered to be major sources of toxic pollution in many states.

Furthermore, some officials provided several other reasons for the insufficient monitoring to identify impaired waters. First, there is no national monitoring requirement that compels them to comprehensively collect toxic pollution data for either point or nonpoint sources. Second, many states do not have the laboratory capabilities and financial resources necessary to support an extensive toxic monitoring program. Because monitoring for toxic substances is an expensive and resource-intensive process, states are most likely to monitor waters suspected or known to have toxic problems. Finally, water quality monitoring for

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nonpoint source pollution is even more limited because of (1) the traditional focus on point source discharges, (2) the fact that such pollution is released from diffuse sources, and (3) the lack of resources necessary to perform the more complex and costly nonpoint source monitoring.<sup>2</sup>

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### **Other Reasons Why Impaired Waters Were Not Listed**

Beyond the states' general lack of water quality data, especially for toxic chemicals and nonpoint source pollutants, there are other reasons why facilities and waters were not identified on the states' 304(1) lists. These reasons range from states' overlooking relevant data that showed permit violations to facilities that were initially listed being subsequently deleted.

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### **Discharge Permit Limit Violations Overlooked**

NRDC and other state environmental groups petitioned EPA to add 25 waters and 37 facilities to Georgia's short list and 22 waters and 25 facilities to Virginia's list. NRDC's rationale for adding waters and facilities to Virginia's list was based on evidence an environmental engineer obtained from the state's own monitoring program data—showing violations of permit discharge limits—that warranted inclusion of the additional waters. NRDC maintains that if such a cursory review of available and routine data resulted in more waters and facilities being added to just one state's lists, other such cases could likely be found in additional states. EPA agreed, on the basis of the evidence as presented, to add about half of the waters and facilities to both states' lists.

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### **Many Facilities Initially Listed Were Deleted From States' Lists**

Nationwide, EPA deleted a total of 309 facilities from the states' facilities lists. EPA and state officials in the regions we visited offered two reasons why facilities were deleted from 304(1) lists. First, fear of the negative image associated with being listed as a toxic pollutant discharger prompted certain industries to pressure states to make their water quality standards less stringent. For example, EPA Region IV officials told us that states in their region were completing their triennial water quality standard reviews concurrent with the 304(1) listing exercise. During this period, the officials said that the paper and pulp industries, which commonly discharge the highly toxic pollutant dioxin, pressured states to change their standards for dioxin after the facilities were initially listed under 304(1). In Alabama, this action resulted in 9 out of 10 paper mills being deleted from the 304(1) discharger list because they were no longer in violation of the new, less stringent dioxin standard.

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<sup>2</sup>Ch. 3 discusses states' monitoring efforts in more detail.

Overall, the region's facilities list was reduced from 36 paper mills to 17 after states adopted a less stringent dioxin standard.

The second reason facilities were deleted, according to officials in Regions I, IV, and V, was that the 304(1) requirement induced some facilities to hook up to POTWs to avoid being identified as direct dischargers of toxic pollutants. EPA Region V officials told us of three facilities in Indiana and four in Ohio that hooked up to POTWs, thereby becoming indirect dischargers not subject to 304(1) requirements. Although EPA officials in Regions I and III could not provide statistics, they too speculated that industries in their states hooked up to POTWs to avoid being identified under 304(1) as a toxic discharger subject to more stringent toxic limits.

## **Few Listed Waters Are Targeted for More Stringent Regulation**

As mentioned earlier, 304(1) requires states to develop an individual control strategy (ICS) to clean up the impaired waters by June 1992. While EPA could have required ICSS for all impaired waters, the agency directed states to write ICSS for only the 529 (2.8 percent) of the total 18,770 impaired waters identified nationwide. These were the waters identified as impaired by point sources discharging any of the 126 priority pollutants. (App. I identifies the number of waters and facilities listed under 304(1) by state.) According to EPA officials, ICSS were required only for "toxic hotspots," i.e., waters on the short list because, in the agency's view, the statute contemplates implementation of ICSS through discharger permits, which provide only point source controls. Furthermore, EPA has not required the states to take any specific or accelerated regulatory action to address pollution problems relating to the long-listed waters, nor have the states we visited initiated any such action.

Although EPA initiated an internal study to determine what to do with waters on the 304(1) long lists, it has not made a final decision. Specifically, only waters with point source discharges included on states' short lists are targeted for more stringent controls and are subject to the accelerated compliance schedule. As a result, no new stringent cleanup requirements apply to the medium- or long-listed waters, many of which are impaired by nonpoint source pollutants or by conventional or non-priority toxic pollutants. On March 23, 1989, NRDC filed a petition contending that EPA erroneously interpreted which dischargers must be identified and the ICS requirement under section 304(1). NRDC argued that all facilities discharging to the impaired waters must be identified and that ICSS should apply to all three lists of waters. On September 28,

1990, the U.S. Court of Appeals for the Ninth Circuit ordered EPA to rewrite its regulation interpreting section 304(1) to require states to identify all facilities discharging toxic pollutants into all listed waters and indicate the amount of toxic pollutants discharged by each source. The court also ordered EPA to reconsider its interpretation that ICSS are required only for toxic pollutants discharged from point sources.

An ICS, as defined by EPA, is a revised NPDES discharge permit with a 3-year compliance deadline. Because the strategies relate only to point source dischargers and not to polluted waters, they do not specifically address nonpoint source pollution problems. Moreover, even those point sources identified as the polluting facilities on a state's short list will not necessarily have to meet more stringent discharge limits. The state could decide that a 304(1)-listed facility's existing permit contains sufficient limitations, and simply add a 3-year compliance deadline. EPA Region V officials confirmed that this was sometimes the case with the ICSS in that region.

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## Conclusions

Section 304(1) was a one-time requirement to identify and clean up the nation's impaired waters—especially those impaired by toxic chemicals—within an accelerated time frame. However, this goal will largely not be achieved by the June 1992 deadline because (1) many impaired waters were not identified and (2) only 529 of the 18,770 impaired waters identified are targeted for more stringent regulatory controls. Furthermore, the 304(1) program as implemented by EPA and states focuses almost exclusively on point source discharges of priority pollutants, effectively disregarding nonpriority pollutants and nonpoint source problems. Also, in many cases the ICSS for facilities discharging to the 529 toxic-impaired waters do not necessarily include more stringent discharge limits, but only the addition of a 3-year compliance deadline.

Some of the problems EPA and states encountered when trying to identify impaired waters are indicative of broader problems associated with the existing regulatory framework for controlling pollutants entering the nation's waters. One of the most significant of the broader problems is the gaps in crucial monitoring activities that are essential to identifying and thereby controlling both point and nonpoint sources of water pollution.

# Existing Water Pollution Programs Are Not Effectively Controlling Toxic Pollution

Existing water pollution programs are not effectively controlling excessive levels of toxic chemicals and heavy metals getting into the nation's waters from point and nonpoint sources. This condition exists for several primary reasons:

- Most states have assessed the quality of only a minority of their surface waters, and the quality of monitoring for the assessed waters varies among states.
- EPA has been slow to develop and revise national effluent guidelines (which include specific discharge limits) for categories of industries discharging toxic pollution; some guidelines date back to the 1970s. Also, EPA has been slow to develop and revise criteria documents for setting individual toxic discharge limits.
- Few states have adopted EPA's criteria for setting numeric discharge limits for individual priority pollutants as part of their water quality standards and, subsequently, their discharger permits.
- Many dischargers, particularly POTWS, are not complying with discharge limits included in their permits.

## States Do Limited Monitoring to Identify Extent and Sources of Toxic Pollution Problems

In the absence of a specific national requirement for toxic monitoring, states monitor the quality of their surface waters in different ways. While EPA requires states to establish monitoring methods and procedures, the agency does not have an enforceable requirement that specifies a toxic monitoring method or how often such monitoring should be done to identify toxic pollution from point and nonpoint sources.

## No National Toxic Monitoring Requirement Exists

The CWA requires states to have an EPA-approved water quality monitoring program but does not direct states to conduct monitoring in any certain way. Specifically, section 305(b) of the CWA requires states to analyze the extent to which all of their navigable waters protect human health and aquatic life and support designated uses. Although states are required to report to EPA on their surface water quality every 2 years, the reported data often account for less than half of the states' total surface water miles.

States have latitude in how they assess the quality of their waters. They can either (1) evaluate descriptive information (such as citizen reports and land-use data) and make professional judgments about the water quality or (2) actually test water samples to determine a waterbody's

overall quality. According to EPA, states most often use evaluative data to assess surface water quality. In any case, this process does not involve monitoring to identify the pollutant or source causing any identified pollution.

EPA regulations require states to establish appropriate monitoring methods and procedures to compile and analyze water quality data but do not require states to assess a specific percentage of their waters as part of the biennial water quality review cycle. The regulations state that water quality monitoring activities should include physical, chemical, and biological data collection and analysis. Also, EPA officials told us that such monitoring should be conducted on both dischargers' wastewater (effluent) and in-stream water (ambient) samples.

Effluent monitoring involves testing wastewaters discharged at the end-of-pipe of a specific facility. In contrast, ambient monitoring includes testing the water column, sediment, and fish tissue to evaluate the quality of the receiving water. Ambient monitoring is a fundamental component of the water quality-based approach to controlling toxic pollution because it can account for both point source and nonpoint source discharges. Most EPA and state officials visited agreed that ambient monitoring is essential to determine the extent and sources of toxic pollution problems. However, three of the four states visited do not routinely conduct ambient monitoring for toxic pollution.

In addition to these general requirements, EPA issued in April 1990 technical guidance that encourages states to use an integrated monitoring approach to detect and control toxic pollution problems. This integrated approach is designed to analyze (1) an individual chemical, (2) the aggregate toxicity of all chemicals in a facility's wastewater discharge, and (3) the toxic effects of all chemicals on the receiving water. Notwithstanding its existing regulations and technical guidance, EPA does not have an enforceable requirement that specifies a toxic monitoring method or the frequency of such monitoring to identify toxic pollution from point and nonpoint sources.

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**States Have Assessed Only  
a Minority of Their Waters**

According to summary data in EPA's National Water Quality Inventory: 1988 Report to Congress (herein referred to as the Water Quality Inventory Report), the percentage of waters assessed nationwide varies



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**Chapter 3**  
**Existing Water Pollution Programs Are Not**  
**Effectively Controlling Toxic Pollution**

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among states.<sup>1</sup> For example, 4 of the 48 reporting states have assessed the quality of 10 percent or less of their rivers and streams, whereas only 10 states have assessed almost 100 percent of these waters.

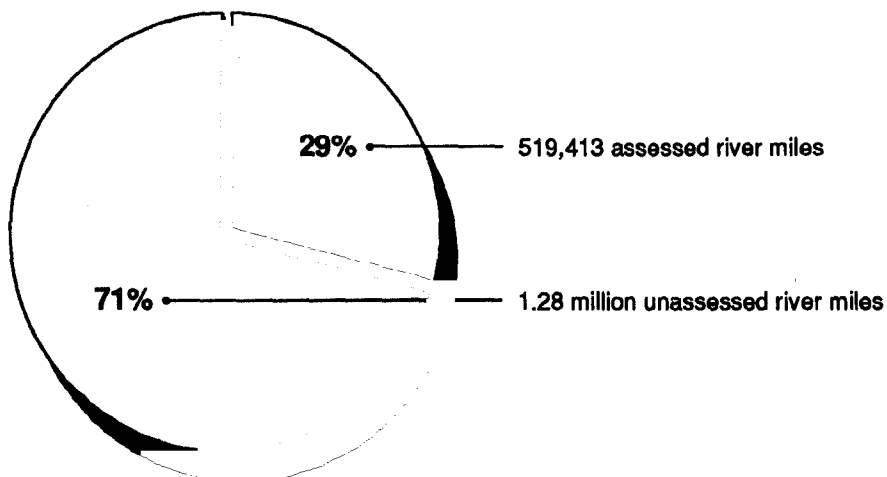
EPA's report also showed that, combined, the states have assessed the water quality of 519,413 river miles<sup>2</sup> (29 percent of the total U.S. river miles) and 16.3 million lake acres (41 percent of the nation's total lake acres). (See figs. 3.1 and 3.2.) EPA and states are uncertain of the water quality of the remaining 71 percent of river miles and 59 percent of lake acres. Acknowledging this deficiency, a division director in EPA's Office of Water told us that states probably should be required to assess a minimum percentage of their receiving waters each year.

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<sup>1</sup>Although EPA published its report in April 1990, information presented in the report is based upon 1986 and 1987 data collected from 48 states. According to EPA officials responsible for compiling these data, this is the most recent national summary information published on the status of states' water quality assessments. However, we obtained copies of the 1990 water quality inventory reports submitted to EPA by the four states we visited.

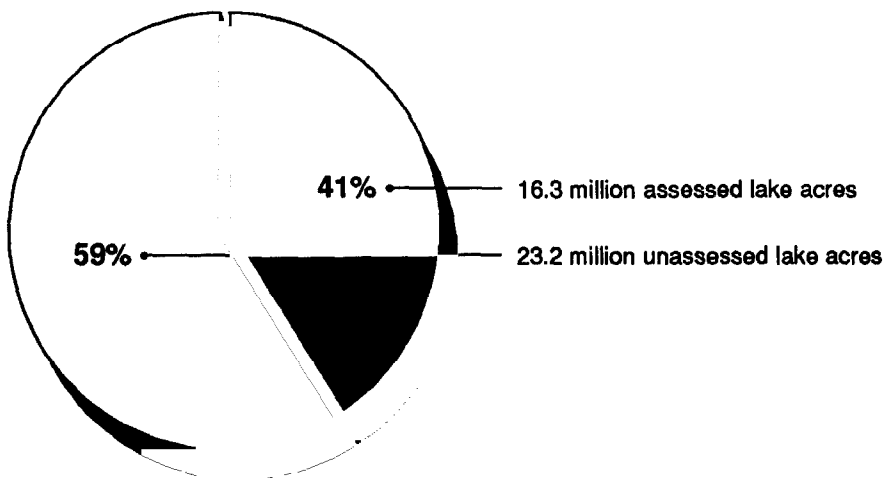
<sup>2</sup>River miles refers to river and stream miles combined.

Figure 3.1: Status of States' River Quality Assessments



Source: EPA's 1988 Water Quality Inventory Report.

Figure 3.2: Status of States' Lake Quality Assessments



Source: EPA's 1988 Water Quality Inventory Report.

### Quality of Monitoring Varies in the Assessed Waters

EPA also acknowledges that when monitoring does occur, the quality varies considerably among the states, and that this too contributes significantly to uncertainty about the full extent of toxic pollution in the nation's waters. Among the key problems affecting the quality of monitoring are that (1) actual sampling of waters is frequently not done to assess water quality, (2) monitoring is largely confined to areas where

known problems exist, and (3) little is done to detect toxic pollution from nonpoint sources.

**Sampling Frequently Not Performed**

As mentioned earlier, EPA allows states to conduct water quality assessments in one of two ways: (1) by evaluating descriptive data, such as citizen complaints and land-use data, and then relying upon professional judgment or (2) by conducting chemical-specific and biological tests on actual in-stream water samples. According to EPA's 1988 Water Quality Inventory Report, only 40 percent of assessed rivers and streams were actually sampled to determine water quality;<sup>3</sup> the remaining 60 percent of assessed waters were evaluated by using descriptive data. EPA acknowledged that assessments based on the evaluative approach represent state officials' judgments about their surface water quality rather than consistent, accurate measures. Many states identified their impaired waters, as required by section 304(1) of the CWA, primarily by using the evaluative approach.

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**Monitoring Focuses on Known Pollution Problems**

In most of the states visited, many officials maintained that their ambient monitoring efforts are largely confined to waters where known pollution problems exist. Even in these waters, the states do limited monitoring to detect the source of toxic pollution. That is, they usually just test for levels of known pollutants being discharged into a particular waterbody rather than for the cause of a pollution problem.

Information included in Massachusetts' 1990 Water Quality Inventory Report illustrates this point. The report states that Massachusetts' monitoring program focuses on surface waters with known or suspected pollution problems. It also notes that since the goal of the water quality assessment is to determine whether waters' designated uses—for recreation, swimming, and fishing—are being maintained, the state usually does not monitor to detect the sources of any water pollution.

Overall, officials in the states we visited generally monitor for a select number of pollutants known or suspected to be in specific waters. For the most part, these are a few of the priority pollutants. Some states also monitor for nonpriority pollutants such as chlorine (a common byproduct of POTWs) that are known or suspected to be causing water quality problems.

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<sup>3</sup>Only 38 of the 48 states that submitted water quality data provided information on what assessment method they used to determine water quality.

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**Little Monitoring for Nonpoint  
Source Toxic Pollution**

Some state and EPA officials acknowledged that they do little or no monitoring of nonpoint source toxic pollution. EPA reported to the Congress in 1989 that it and states have largely focused attention on pollution caused by point sources because these discharges were causing major, visible problems in surface waters. Also, EPA noted in its 1988 Water Quality Inventory Report that while detecting point sources of toxic pollution requires sophisticated tests, nonpoint source discharges are difficult to identify because they are released from diffused sources. Therefore, nonpoint source monitoring is more complex and costly because it is often episodic and unpredictable. In addition, EPA's Monitoring Branch has not developed nonpoint source monitoring techniques because of its resource constraints.

Beyond technical difficulties in identifying these diffuse sources of pollution, state officials said that the Clean Water Act's statutory requirements emphasizing point source controls (such as compliance with permit programs) dictate that these programs take primacy over nonpoint source program activities. As we noted in our report on the barriers to nonpoint source pollution control, a disproportionate amount of resources are dedicated to point source programs, even though nonpoint source pollution may pose comparable health and more serious ecological risks.<sup>4</sup>

**Resource Constraints Hamper  
Monitoring**

EPA and state officials told us that they lack the staff and financial resources necessary to adequately assess and routinely monitor all their waters. They added that when available federal and state funds are reduced, ambient monitoring is often the first water quality activity cut.

The Chief of Georgia's Water Quality Branch, for example, explained to us that the state's monitoring budget is cut before other programs (such as permits and enforcement) because these activities are legally mandated. Currently, Georgia officials conduct ambient monitoring at 10 to 20 sites per year. They emphasized that fewer sites will be monitored in coming years if water quality responsibilities continue to increase without additional resources becoming available.<sup>5</sup> Similarly, Michigan's 1990 Water Quality Inventory Report indicates that the state has already decreased its monitoring activities from 599 sites in 1973 to 64

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<sup>4</sup>Water Pollution: Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution (GAO/RCED-91-10, Oct. 15, 1990).

<sup>5</sup>States receive federal grants under section 106 of the CWA to conduct water quality activities. Monitoring is one of several activities funded by such grants. An official in EPA's Office of Water estimated that federal funds constitute only 20 percent of states' monitoring funds.

sites in 1990 because of limited funds. Also, Massachusetts officials told us that they have reduced some of their toxic monitoring activities because of limited resources.

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## **National Standards Control Only a Limited Number of Toxic Discharges**

Over the past 2 decades, EPA has been slow to revise existing effluent guidelines and to develop new ones to control toxic water pollution. Specifically, some existing effluent guidelines do not reflect the latest advances in treatment technologies available to eliminate toxic and nonconventional discharges. Many categories of industries discharging toxic or nonconventional pollutants are not covered by such guidelines. Also, criteria documents developed by EPA and used by states to establish numeric discharge limits only cover a limited number of toxic pollutants and have been infrequently updated.

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## **National Effluent Guidelines Do Not Address Many Toxic Pollutants and Dischargers**

Since 1974—when effluent guidelines were first issued—EPA has promulgated guidelines for 51 categories of point sources. Guidelines for 35 of the 51 categories are specifically aimed at controlling toxic pollutants. The others focus primarily on conventional pollutants. According to EPA headquarters officials, these guidelines were largely developed as the result of a lawsuit brought against EPA by NRDC and others in 1976.<sup>6</sup>

Our review of summary data prepared by EPA showed that 19 of the 35 guidelines have not been revised in over 5 years, or since they were first issued. In fact, 9 of the 19 guidelines date back to the 1970s. EPA officials acknowledged that they have not reviewed the adequacy of the guidelines and/or updated many of those that need revising to reflect advances in treatment technologies, as required by the CWA. The officials also added that some of the guidelines do not include limits for all toxic pollutants discharged by the industries. In addition, EPA acknowledged that there are industries discharging toxic and nonconventional pollutants for which national guidelines have not been published.

Neither EPA headquarters nor state officials could readily tell us how many facilities with active discharge permits are covered by toxic-related guidelines. However, EPA headquarters officials estimated that only about 20 to 30 percent of permitted facilities—mainly those classified as major dischargers—are covered by national guidelines.

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<sup>6</sup>The consent decree required EPA, among other things, to develop toxic-related guidelines for 34 specific industrial categories. The guidelines were to control any of the 126 priority pollutants found in wastewaters of the “covered” industries. The categories of industries currently covered by existing effluent guidelines are listed in app. II.

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Findings from EPA's 1986 Report to Congress on the Discharge of Hazardous Wastes to Publicly Owned Treatment Works (often referred to as the Domestic Sewage Study) support the fact that existing guidelines do not control harmful toxic pollutants. According to the report, guidelines for the metal finishing, pharmaceutical, and organic chemical industries do not specifically regulate nonpriority toxic pollutants, such as methanol and xylene, despite the fact that these pollutants are being discharged in significant concentrations. The report also identified several industries, such as printing and publishing, equipment manufacturing, and industrial/commercial laundries, not covered by national guidelines that were discharging large quantities of toxic pollutants to POTWs. As part of its efforts to implement requirements of the Water Quality Act, EPA plans to study industries in the industrial laundries category to determine whether guidelines should be developed.

**Resource Constraints Hinder  
Development of Effluent  
Guidelines**

Our review confirmed findings of a March 1990 report issued by EPA's Office of Policy, Planning and Evaluation about the effluent guidelines development process. This report cited the lack of staff and financial resources as the biggest barriers to developing toxic guidelines. Over the past decade, there has been a tremendous decrease in available staff and funds to support program activities, such as data collection and analyses. In addition, there has been a high turnover among staff directly involved in developing guidelines. Because of limited staff, one person is usually responsible for all aspects of reviewing, revising, or developing a number of guidelines, which can involve numerous facilities, products, and complex production processes.

To comply with section 304(m) requirements, EPA issued its plan on January 2, 1990, for reviewing and revising existing guidelines and developing new guidelines for industries not currently covered by national standards.<sup>7</sup> According to EPA officials, this plan outlines their priorities in terms of which existing guidelines to review and revise and which new guidelines to develop over the next 5 years. The officials explained, however, that additional resources will be needed to implement the plan. To address this problem, they have begun to consider alternative ways to obtain additional resources for the guidelines program. In light of resource constraints and the importance of effluent guidelines for controlling toxic water pollution, EPA officials need to follow through with

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<sup>7</sup>Under this plan, EPA intends to promulgate new guidelines for five categories of industries; revise existing guidelines for three categories; review existing guidelines for three categories to determine whether they should be revised; and study eight categories to determine whether guidelines should be developed.

their planned efforts to seek financing alternatives to support this program.

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### **Few Criteria Documents Issued to Help States Set Numeric Limits for Priority Pollutants**

As with the effluent guidelines program, EPA also has been slow in developing and revising criteria documents for setting numeric limits for the 126 priority pollutants, as required by the CWA. To date, EPA has issued 108 human health and 22 aquatic life criteria documents for priority pollutants. EPA has issued 9 human health and 10 aquatic life criteria documents for nonpriority pollutants. EPA issued nearly all of these documents between the early and mid-1980s, and has published updates to less than one-third of the human health criteria documents.<sup>8</sup> According to the Chief of EPA's Criteria Branch, none of the aquatic life documents has been revised. In addition, EPA has not developed criteria documents or comparable technical information for states to use to develop water quality standards for controlling nonpoint source pollution.

EPA officials acknowledged that the criteria documents have not been issued or updated as necessary to control toxic discharges. They also said that such documents should be issued for the numerous nonpriority pollutants that could cause serious health problems. As is the case with the effluent guidelines program, EPA officials told us that the lack of resources has hampered their efforts to issue more timely criteria documents. They added that because of limited resources to develop data and perform analyses, they have to rely on data published in various scientific journals or obtained from members of the scientific community. The officials told us that they use their professional experiences, along with in-house research conducted at one of three EPA laboratories, to fill in data gaps. Here, too, the officials told us that they are considering alternative ways to obtain resources for this activity.

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### **States Have Few Numeric Limits in Their Water Quality Standards and Discharge Permits**

States use EPA's criteria documents for the priority pollutants and some nonpriority pollutants as the basis for incorporating numeric criteria into their water quality standards and, subsequently, numeric limits into their discharge permits. In addition, EPA and state officials use the national effluent guidelines to incorporate limits into discharge permits. We found that even when criteria documents do exist, states are often reluctant to adopt numeric discharge limits based on EPA's criteria. In the absence of effluent guidelines, EPA and state permit writers must

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<sup>8</sup>The CWA requires EPA to periodically review and publish criteria documents for water quality.

rely on their professional judgment to set discharge limits—a process that produces inconsistent and less defensible results.

### States Have Been Reluctant to Adopt Numeric Toxic Discharge Limits

To accelerate states' efforts to control toxic pollutants, section 303(c)(2)(B) of the CWA directs states to adopt numeric criteria as part of their water quality standards for all priority pollutants for which EPA has developed criteria documents and the discharge or presence of which could reasonably be expected to interfere with designated uses. EPA's criteria documents contain scientific data on the (1) effects of a pollutant on human health and aquatic life and (2) concentration of a pollutant in a waterbody that is supposed to protect human health, aquatic life, and designated use. Where EPA has not published criteria documents for specific pollutants, states are to use biological monitoring techniques and assessment methods to establish toxic limits.

According to EPA, only 24 states were in full compliance with the section 303(c) requirement as of March 1991. The reluctance of most states to comply with the 303(c) requirement compelled EPA to issue a notice on January 26, 1990, of its intent to promulgate a national rule to establish toxic water quality standards for states that fail to comply by the February 1990 deadline. EPA officials expect only a few states to be in non-compliance with the 303(c) requirement by the end of 1991, when EPA expects to issue the final rule.

EPA regional and state officials we visited cited three reasons why states have been reluctant to adopt EPA's criteria for setting numeric discharge limits as part of their water quality standards. First, some officials said that states question the validity of scientific data, methodology underlying some toxic criteria, and/or laboratory analyses EPA used to develop the documents. They also told us that the scientific data included in the documents are outdated. In addition, they fear adoption of such criteria could result in legal challenges of a standard or discharge limit. Such legal challenges could put additional strain on states' limited resources and take years to resolve.

Second, some state officials commented that permit limits based on EPA's criteria are too stringent. Also, these officials noted that some pollutant limits included in states' surface water quality standards are more stringent than limitations for the same pollutants regulated by states' drinking water standards. In other cases, state officials commented that some limits are set below the level at which the pollutant can be



detected in the water, thereby creating difficulty in determining whether a facility is in compliance with its permit limits.

Third, some state officials said that incorporating numeric toxic criteria into their water quality standards involves lengthy and burdensome state rulemaking procedures. Therefore, some states, such as Massachusetts and Michigan, have written numeric toxic limits directly into discharge permits without first having these limits in their water quality standards. Other states, such as Georgia, prefer not to impose such permit limitations until the limits are formally adopted in their water quality standards. Georgia officials prefer this approach because they are concerned that they would otherwise be open to legal challenges.

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**Lack of Defensible Limits  
Complicates Permit  
Writer's Job**

In the absence of national effluent guidelines or numeric criteria in state water quality standards, permit writers must rely on their best professional judgment to develop appropriate pollutant limits. EPA and state officials told us, however, that some writers do not have the technical expertise to write effective permits in the absence of national discharge limits. They also believe that some writers may be intimidated by industry representatives and fear possible legal challenges if they include very stringent limits in permits. The officials added that if writers choose to incorporate stringent limits using their judgment, some industry representatives believe that these limits are inherently less legally defensible and may challenge them in court.

This assertion was substantiated by some of the officials we visited. For example, Michigan officials told us that at least 24 permittees appealed permits whose toxic discharge limits were largely based upon best professional judgment. Michigan officials said far fewer permits based on the national effluent guidelines have been challenged in their state. Accordingly, EPA officials and many state officials told us that it is essential to have comprehensive, up-to-date, and legally defensible national guidelines for writing permits.

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## More Stringent Toxic Requirements May Increase Noncompliance and Enforcement Problems

Many EPA and state regulatory officials agree that once more stringent toxic pollution controls are incorporated into NPDES permits, as required by the Water Quality Act of 1987, some facilities, particularly POTWs, will have difficulty complying with these new permit requirements. They also believe that more stringent toxic controls may make the enforcement burden greater and give impetus to additional requests by permittees for variances from these requirements.

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## Expected Noncompliance Problems Focus on POTWs

While EPA and state officials speculate that both industrial and municipal facilities will encounter compliance problems, they believe noncompliance with the more stringent permit conditions is more certain for POTWs. These facilities are already experiencing greater difficulties complying with current permit conditions.

As we noted in our 1989 report, Water Pollution: Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers (GAO/RCED-89-101, Apr. 25, 1989), industrial users of POTWs were in considerable noncompliance with toxic discharge limits, and POTWs are frequently not equipped to treat toxic wastewaters. Also, POTWs are often reluctant to take enforcement action to bring users back into compliance. Because of the 1987 CWA amendments, both the industrial users of sewage treatment plants and the POTWs will eventually be subject to more stringent toxic discharge limitations. Therefore, POTWs will need to (1) better enforce industrial users' pretreatment requirements and/or (2) enhance their plants' operation, maintenance, and treatment capability. Such enhancements will be very expensive for POTWs.

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## Increase in Requests for Variances Expected

EPA's regulations on water quality standards allow states, with EPA approval, to have a provision in their state standards for granting variances. Under EPA regulations, variances may be granted on the basis of one of several factors, including the condition that meeting the established standard could be demonstrated to cause "substantial and widespread economic and social impact." Other provisions, while not technically referred to as variances, can also serve to exempt a facility from complying with permit conditions or water quality standards.

Concerned that states might be "routinely and improperly granting variances," officials in EPA's Office of Water Criteria and Standards Division surveyed the states. The officials found that 32 states have the authority to grant variances, but only 16 states have done so. Among

the other findings were that the 16 states have granted over 400 variances;<sup>9</sup> 7 states granted variances because of economic impact on a discharger; and 15 granted variances because of the economic impact on a community.

The study also found that various state provisions allow variances from water quality standards for individual dischargers, for entire waterbodies, and from discharge limits included in permits, among other situations. The Chief of EPA Region V's permits section said that states can allow "site-specific modifications" to discharge permits, which in effect are permit variances that she believes have been granted too often in many cases. These site-specific modifications can involve changing the numeric criteria in a water quality standard but not its designated use.

According to EPA, variances should not exceed 3 years, the time frame for the review of water quality standards. Fourteen states have granted variances for an unspecified length of time. In addition, we found that three states in Region IV have granted variances to water quality standards. The officials told us that the variances are reviewed once every 5 years instead of 3 years because of resource constraints.

The officials concluded in a November 1990 report, entitled National Assessment of State Variance Procedures, that the data collected did not support the assertion that states are routinely and improperly granting variances. However, these officials did conclude that states are inconsistently granting variances and variance-like exceptions. The officials also predicted that once states incorporate numeric toxic criteria into their water quality standards and increase the stringency of the permit discharge limits that already exist, states will grant additional variances. These variances are likely to be requested by facilities unable to meet the necessary limitations.

The problem with states inconsistently granting variances and the potential increase in variance requests is exacerbated because EPA does not have a clear national policy on how and when states can grant legitimate variances. At the same time, EPA regional authorities have no clear basis for approving or disapproving states' and facilities' requests for exemptions. EPA officials told us of their intention to amend the water quality standards regulation to clarify variance provisions, but they

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<sup>9</sup>Virginia reportedly granted over 200 variances for chlorine, and Florida could not provide data on the number of variances it granted from 1988 to 1990, although it granted 65 between 1983 and 1987.

have not indicated specifically how or when they intend to change the requirement.

## Conclusions

Existing water pollution programs are not effectively controlling toxic pollutants because of significant problems found in the four key functions currently in place to identify and control toxic water pollution. These problems include the following:

- Water quality monitoring is not comprehensive enough to accurately assess the full extent and sources of toxic pollution problems caused by point and nonpoint sources.
- National effluent guidelines and criteria documents used to set numeric toxic limits address only a limited number of toxic discharges and have not been developed and/or updated as necessary to control toxic discharges.
- Some states have been reluctant to adopt numeric toxic discharge limits into their water quality standards and discharge permits.
- Many dischargers, particularly POTWs, are having difficulty complying with existing discharge limits.

As difficult as these problems are for point source discharges, they are even more difficult for nonpoint source discharges because EPA and states have focused little attention on controlling pollution from these sources in the past. In the case of nonpoint pollution, monitoring is less frequent; far fewer standards exist; permit limits rarely take these sources into account; and violators are often not identified, much less subjected to enforcement actions.

Some of these problems can be addressed relatively inexpensively through improved management. However, the most serious problems, particularly those relating to water quality monitoring and development of effluent guidelines and criteria documents, do require increased funds—a difficult problem during a time of budget deficits and fiscal restraint.

## Recommendations to the Administrator, EPA

To improve controls over the discharge of toxic pollutants to the nation's waters, we recommend that the Administrator, EPA, take the following actions:

- Accelerate the development and revision of national effluent guidelines and criteria documents by focusing on the most harmful toxic pollutants

being discharged to the nation's receiving waters. We also recommend that the agency follow through with its initial efforts to find alternative ways to obtain additional resources to support the development of guidelines and criteria documents.

- Issue guidance directing states to conduct more ambient monitoring for toxic pollutants as part of the biennial water quality inventory reporting process and to assess the quality of a minimum percentage of their surface water miles during each biennial review cycle.
- Issue guidance on how and when states may grant variances for state water quality standards and for individual toxic discharge limits in permits.

# Innovative Approaches Are Needed to Finance Water Pollution Programs and Prevent Toxic Discharges

While the types of corrective actions discussed in chapter 3 would help to achieve water quality goals mandated by the Clean Water Act, such measures will add significantly to the financial burden EPA and states are already experiencing in controlling toxic water pollution. To deal with this problem, at least 30 states use alternative financing mechanisms (AFM), such as fees and taxes paid by dischargers, to generate additional revenues for water quality programs and activities. In many states, however, AFMs are either not being used or the revenue generated is only a small fraction of the funds needed to support expenditures for water quality programs. Among the key barriers hindering greater use of these mechanisms are concerns among state officials that imposing additional pollution control costs on dischargers could discourage industrial development or cause some industries to leave the state.

Nevertheless, recent studies indicate that even with maximum contributions, revenue generated by AFMs will not significantly close the gap between program costs and available resources. EPA predicts, for example, that continued use of the command-and-control approach to controlling water pollution is expected to cost about \$58 billion annually by the year 2000.<sup>1</sup> Accordingly, EPA and state officials have begun to rely increasingly on new techniques to prevent toxic water pollution. Here too, however, a number of institutional, technical, financial, and other barriers are preventing wider use of preventive techniques to control toxic water pollution.

## Alternative Funding Sources Are Needed to Support Pollution Control Activities

According to recent studies conducted by EPA and the National Governors' Association, the costs of environmental protection have steadily been increasing over the past decades. In contrast, federal and state resources available to pay for the increased expenditures have remained constant or increased only slightly. As a result, EPA and states are experiencing funding shortfalls. These shortfalls are expected to increase in future years as more statutory requirements become effective.

Nevertheless, EPA predicts that financial responsibility to close the anticipated funding gaps will shift increasingly to the states. Also, EPA officials told us that the lack of adequate resources will severely hinder their abilities to effectively control toxic water pollution. For example, they told us that certain activities, such as water quality monitoring,

<sup>1</sup>EPA cited these predictions in its report entitled *Environmental Investments: The Cost of a Clean Environment*, dated December 1990. These predictions include projected costs for EPA, states, and industries but do not include future costs associated with any additional legislation the Congress might enact before then.

development of national effluent guidelines, and various oversight activities, will continue to be limited by resource constraints.

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### **States' Use of AFMs Varies Considerably**

According to a 1989 study conducted by the National Governors' Association, many states actively use AFMs to generate additional revenue for their water quality and other environmental programs. However, the extent of their reliance on these funding sources varies. Some states use AFMs to support most of their program needs; some use them for only a small fraction of their program needs; and yet others rely entirely on traditional federal and state funding sources.

The Association found that 44 states use a variety of AFMs, including fees, taxes, or bonds to generate additional revenue for their air, hazardous waste, and water quality programs.<sup>2</sup> The Association further reported that 30 states use fee programs to generate additional revenue for their water quality programs. These states primarily rely upon permit application, training, and/or certification fee systems to generate the additional revenue. In 1988 these 30 states collected roughly \$46 million from their fee systems; the average system generated approximately \$536,000.

Five of the 44 states reported using taxes to generate about \$88 million in 1988 for their water quality programs. Approximately 50 percent of the revenue received came from "sin taxes" (e.g., taxes levied on the sales of liquor and cigarettes). Twelve of the 44 states reported using state revolving loan funds, and 9 of the 44 states reported using bonds to finance major capital projects for water treatment systems or facilities.

There are considerable variations among states, however, on the types and number of AFMs used, total amount of revenue generated, and use of the revenue. According to the Association study, AFMs accounted for between 2 percent and 94 percent of the responding states' total water quality program budgets in 1988. Also, the study found that 12 of the 48 states and territories did not use AFMs. Among the four states we visited,

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<sup>2</sup>The National Governors' Association conducted its study between September 1988 and May 1989 to identify, among other things, (1) potential funding gaps confronting states trying to meet federal and state environmental mandates, (2) financing alternatives available to help states finance environmental programs, and (3) how extensively the alternatives are being used by states. Forty-eight states and territories participated in the study, which was supported by a grant from EPA's Office of Cooperative Environmental Management within the Office of the Administrator.

three use AFMS. Only one, Georgia, does not use any AFMS to supplement its water program activities.

Pennsylvania has eight fee systems in place for all its water programs, including drinking water, groundwater, and surface water programs. Four of the fee systems specifically relate to surface water activities mandated by the Clean Water Act. Under these systems, the state charges industrial and municipal facilities both NPDES and state permit fees. Fees collected from industrial facilities total approximately \$150,000 annually. Funds collected go directly to a Clean Water Fund and are used to pay for special projects or studies relating to significant water pollution problems, including toxic pollution problems. Fees collected from municipal facilities total over \$300,000 annually. Importantly, these funds go back into the state's general revenue fund rather than to fund water pollution control activities.

At the other end of the spectrum, New Jersey relies on 19 AFMS to support a variety of its water program activities. A New Jersey official estimated that 61 percent (or about \$31 million) of the Water Resources Division's operating budget came from AFMS in 1990. AFMS are expected to provide 62 percent (or \$31 million) of the operating budget in 1991. All revenue generated by the AFMS is used to support the specific environmental program that generated the funds. For example, revenue collected from NPDES permit fees is used to support personnel and other NPDES program activities.

Between these two cases are a number of other states that use AFMS to generate revenue and earmark funds collected for specific water pollution control activities. For example, West Virginia charges both application and annual NPDES permit fees, which vary with the size and type of facility. In fiscal year 1989, the first year of this system's implementation, state officials collected \$600,000, which was used to pay the NPDES permit staff's salaries and to support other water pollution control activities.

In some cases fees are used to support a broad range of environmental pollution control activities. For example, Massachusetts officials told us that they recently instituted a fee system in which industrial facilities are required to pay a sliding scale fee for all their air, water, and hazardous waste discharge permits. The fee is based on the amount of time state personnel spend processing an application and issuing a permit. This system is expected to generate \$6 million in fiscal year 1991 with



funds going directly to the state's Environmental Permitting and Compliance Fund. Monies deposited in this fund will be used for conducting compliance inspections and other permitting activities.

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### **EPA Is Also Trying to Help Generate Additional Resources**

EPA is attempting to encourage states to make greater use of AFMS through a number of activities. For example, during fiscal year 1991 the Office of Water plans to establish an environmental financing network that will provide information on successful uses of different AFMS by states nationwide. It will also include a national hotline that states can use to obtain the names of experts with considerable public financing experience as well as to request financing publications.

In addition, EPA has also formed an EPA/state advisory committee to facilitate technical assistance and transfer information on AFMS between states and other entities involved with environmental protection, and has provided states access to financial consulting expertise from EPA contractors. Office of Water officials are also available to appear before state agencies and legislatures to support state water program officials' requests for more funds.

EPA is also looking for ways to support its own water pollution control activities. As required by the Omnibus Budget Reconciliation Act of 1990, EPA will begin collecting fees in 1991 from dischargers for preparing their NPDES permits. However, revenue collected is to be deposited into a special account for environmental services in the U.S. Treasury. These funds will be dispersed through appropriations and can only be used to carry out activities for which the fees were collected.

EPA's Office of Policy, Planning, and Evaluation has initiated a project to develop a fee system based on the toxicity of a facility's discharge, according to an official. The system would apply to dischargers in the 12 states for which EPA currently writes NPDES permits. Under this system, facilities would pay a sliding scale fee, based on the toxicity of their wastewater discharges. All revenue collected would be deposited into a Water Pollution Trust Fund managed by EPA. EPA would use a portion of the revenues for administrative expenses; the remaining funds would be distributed to states for implementing pollution prevention practices. In addition to generating revenue, this fee system is to serve as an incentive for facilities to reduce the amount of toxic pollution they produce, according to EPA officials. Although this initiative is still in the early developmental phase, an EPA official told us that he hopes to complete the project by the end of 1991.

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**Barriers Currently**  
**Hindering Greater Use of**  
**AFMs**

Despite the growing support for AFMs as a means of supplementing traditional funding sources for water programs nationwide, these tools still have a long way to go before they can significantly close the gap between funding needs and available resources. As noted earlier, in many states AFMs are generating only a small fraction of the funds needed to support water quality program expenditures.

One of the primary reasons states do not rely more on AFMs is their reluctance to impose additional pollution control costs on industries. Georgia officials, for example, explained that AFMs have received little support from the state legislature because legislators fear that the added cost of pollution control will discourage industrial development, or cause existing industries to move to states that currently do not use such mechanisms. Industrial flight, in turn, would damage the state's economy.

Similarly, Michigan water program officials have drafted legislation for a fee system to support the state's surface water program. Under this system all dischargers would pay an annual NPDES permit fee. The officials estimated that \$3.2 million would be generated in fiscal year 1991. The funds collected will be used to support permit development, issuance or modification, and water quality and compliance monitoring. Michigan officials expect the fees collected to cover approximately 30 percent of program expenditures in fiscal year 1992 and subsequent years. However, an official in Michigan's Department of Natural Resources told us that department officials had not sent the plan to the state legislature because it has not gotten the necessary political support.

According to the EPA and Association studies, the lack of political or state legislative support is a prime barrier hindering states' use of AFMs. To address this barrier, Office of Water officials told us that EPA is working with state governors, legislators, and industry representatives to help them better understand the benefits of AFMs. Also, Office of Water officials are available on request to appear before state agencies and legislatures to discuss ways to overcome existing barriers.

The studies also cited a number of other reasons inhibiting wider use of AFMs, including the following beliefs:

- The administrative costs to start up and manage AFMs could exceed generated revenues. Also, fluctuations in the annual revenues generated by

AFMs, particularly fees and taxes, could make it difficult to achieve a steady or specific level of funding each year.

- If dischargers pay a substantial portion of program costs, they may assert greater influence in states' environmental policy decision-making processes. This influence could result in implementation of less stringent pollution controls, such as inappropriate discharge limits in permits.
- Tax dollars, not industry user fees, should be used to fund environmental programs because environmental protection benefits everyone.
- Revenues collected through AFMs may be offset by reductions in general state funds.

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## **Pollution Prevention as an Alternative to Controlling Toxic Water Pollution**

While greater funding will help to improve implementation of control strategies, EPA and state officials have come to realize that the existing command-and-control approach can go only so far in dealing with pollution problems. As noted earlier, EPA has predicted that continued use of this approach to reduce water pollution is expected to cost about \$58 billion annually by the year 2000.

Even after EPA and states take actions to correct problems identified in the existing pollution control programs, there are limits to how effectively these programs can address toxic water pollution. For instance, some toxic pollution problems can be remedied only at enormous expense, and some hazardous chemicals cannot be effectively removed from surface waters at any price. Furthermore, many pollutants come from a variety of largely unregulated activities such as dry cleaning, paint stripping, and degreasing operations. These and other small sources are so numerous that it is difficult to control them through the command-and-control approach.

Recognizing the limitations of implementing the command-and-control approach, EPA and some states have begun integrating prevention practices into their existing pollution control programs. Similarly, some companies have begun to take steps on their own to reduce their toxic discharges. Nevertheless, a number of institutional, technical, and financial barriers are hindering greater reliance on prevention strategies. EPA has recently begun implementing a number of activities to help alleviate these barriers. Although it is too early to predict their effectiveness, the full potential of EPA's efforts is constrained to some extent by statutory requirements that mandate a focus on controlling pollution while doing little to encourage prevention activities.

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## **State and Industry Pollution Prevention Initiatives**

Nationwide, several states have a range of activities under way to adopt prevention strategies as part of their existing water pollution program structures. According to EPA officials, some states, such as North Carolina and Massachusetts, have been more aggressive in adopting the prevention concept than others. Among other things, some states have set up clearinghouses to provide information about pollution prevention practices and to make referrals for additional information; establish public education and outreach programs; and offer on-site technical assistance to show businesses opportunities for reducing or eliminating pollution. These states and others also offer technical assistance to companies wanting to eliminate or reduce their toxic discharges.

In addition, Massachusetts, North Carolina, and Mississippi, among others, have enacted legislation to promote pollution prevention in water as well as other environmental media. Massachusetts, for example, enacted the Toxic Use Reduction Act in 1989 to reduce by 50 percent the generation of toxic wastes by 1997. North Carolina and Mississippi enacted legislation in 1989 and 1990, respectively, to promote elimination of hazardous materials, including toxic chemicals, and to encourage recycling practices. Under these laws facilities are required to look for ways to reduce their use and discharge of harmful chemicals.

Some industries are also beginning to incorporate pollution prevention into their facility operations to reduce either costs or the amount of toxic pollutants being discharged. For example, in 1987 the Polaroid Corporation established a Toxic Use and Waste Reduction Program to reduce the overall volume of toxic chemicals used and to encourage recycling and reuse of chemicals that might otherwise be dumped into waste streams. The company hopes to achieve a 50-percent waste reduction by 1993. Similarly, a Clairol plant producing hair care products previously flushed its pipes with large quantities of water that carried off the toxic waste material inside the pipes. By installing a \$50,000 system using a foam ball propelled through the pipe to collect wastes, the company reduced its waste load by 395 gallons per day. The company saves about \$240,000 per year using this system.

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## **Barriers Hindering Greater Reliance on Prevention**

EPA and state officials told us that while they are attempting to effectively address toxic pollution through both the control and preventive approaches, a number of interrelated barriers currently hinder their efforts. These include problems that are institutional, technical, financial, and political in nature.

Institutional barriers often arise because federal and state program officials dealing with pollution problems are more accustomed to the traditional command-and-control approach than to promoting prevention. For example, EPA and state pollution control activities are organized along specific media lines (i.e., air, water, and hazardous waste disposal/remediation). According to EPA and state officials, this structure hinders efforts to implement effective prevention strategies because it encourages regulators to focus on a particular medium and therefore discourages a multimedia approach to addressing prevention.

According to some EPA and state officials, technical problems include the lack of expertise necessary to identify and make process changes to eliminate or reduce pollution. These barriers also include the lack of basic information about what others are doing to eliminate or reduce toxic discharges. Furthermore, pollution prevention coordinators in EPA headquarters and Region IV told us that such problems arise most frequently with small companies, which generally believe they do not have the expertise needed to change industrial processes to focus on prevention. Consequently, they often resist incorporation of pollution prevention into their operations.

Resource constraints inhibit industries' efforts to change their manufacturing or treatment processes and EPA's and states' efforts to provide technical assistance. For example, according to EPA and state officials in Region IV, some small companies have expressed concern that they do not have the financial resources necessary to hire competent and experienced experts to help determine or change their manufacturing processes to utilize prevention opportunities. With most of EPA's and states' resources dedicated to mandated programs, officials said that few of their resources are available to provide assistance to these companies.

Political barriers include state and local entities' reluctance to encourage or require industries to adopt prevention strategies for fear that such actions might lead them to relocate elsewhere. State legislatures, for example, have resisted passage of prevention-oriented laws, or have been reluctant to provide funds to implement or support prevention activities. Some officials in EPA headquarters and Georgia told us that this reluctance often stems from political pressure from dischargers.

As difficult as it is to prevent pollution from industrial and municipal point sources, it is even more difficult when dealing with nonpoint sources. In our recent evaluation of EPA's activities to help control

nonpoint source pollution, we identified many of the same technical, resource, and other barriers noted above, which complicate efforts to deal with the problem.<sup>3</sup> The report notes that these problems are generally more difficult to resolve in the case of nonpoint source pollution, in which the sources are not easily identifiable.

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### **EPA Efforts to Overcome Pollution Prevention Barriers**

In recent years EPA has undertaken several activities to incorporate pollution prevention into its own and state environmental programs. A major action was the creation of the Office of Pollution Prevention in 1988, which is responsible for overseeing all of EPA's prevention efforts and for developing EPA's national strategy for implementing prevention practices. Other EPA prevention activities include providing grants to states to address pollution on a multimedia basis, establishing a municipal water pollution prevention program, and establishing cooperative workgroups with states and private sector representatives to exchange information and ideas about pollution prevention practices.

The Office of Pollution Prevention issued EPA's national pollution prevention strategy in January 1991. While the strategy neither seeks to expand EPA's existing authority nor proposes any new regulatory requirements, it does include two major objectives for implementing a national approach to pollution prevention. One primary objective of the strategy is to provide guidance and direction for incorporating prevention into EPA's regulatory and nonregulatory programs. To achieve this objective, EPA plans to

- work with industries to encourage them to identify and profit from prevention opportunities;
- coordinate its own regulatory programs to help industries identify the potential for multimedia prevention strategies that reduce compliance costs;
- encourage the inclusion of pollution prevention conditions in enforcement settlements;
- streamline regulatory and administrative processes involved in testing and applying innovative prevention technologies;
- promote prevention among small and medium-sized businesses through technical and financial assistance and information sharing;

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<sup>3</sup>GAO's recent report on nonpoint source pollution discusses how federal agencies pursuing their missions can conflict with state water quality goals and what actions are under way to address these conflicts.

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**Chapter 4  
Innovative Approaches Are Needed to  
Finance Water Pollution Programs and  
Prevent Toxic Discharges**

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- work with other federal agencies, such as the U.S. Department of Agriculture, to develop prevention strategies for agriculture, energy, and other environmental sectors; and
- strengthen the existing regulatory pollution control framework to provide various incentives for using the preventive approach.

To support many of these and other prevention activities, the Office of Pollution Prevention in fiscal year 1991 began awarding a total of \$11.8 million for a 2-year period to states, EPA regions, EPA headquarters program offices, and selected small businesses for 25 multimedia pollution prevention projects. According to EPA headquarters officials, many of these projects are already under way or being planned. Although these projects are not specifically aimed at surface waters, EPA officials told us that many of these projects will address toxic water pollution problems.

Another key objective of EPA's prevention strategy is to establish an initiative that will achieve specific prevention objectives within a reasonable time frame. To achieve this objective, EPA launched an Industrial Toxics Project in February 1991. This project is aimed at getting facilities to voluntarily reduce their releases and transfers of 17 high priority toxic chemicals, most of which are the priority pollutants, by 33 percent by 1992 and at least 50 percent by 1995. EPA believes that these facilities are the largest contributors to a universe of 1.4 billion pounds of toxic wastes discharged annually into various environmental media as reported through the Toxic Release Inventory established under section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (P.L. 99-499).

In addition to the Office Of Pollution Prevention's efforts, EPA's Office of Water has initiated a number of pollution prevention activities. EPA's regional offices have also increased their emphasis on pollution prevention.

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**Clean Water Act  
Emphasizes Pollution  
Control Rather Than  
Prevention**

Although EPA's actions to emphasize prevention are steps in the right direction, the full potential of these efforts is constrained somewhat by the CWA. The CWA does not promote effective implementation of prevention practices for several reasons:

- It mandates a command-and-control approach, which requires that the bulk of federal, state, and industry resources and attention be devoted to controlling toxic pollution instead of preventing it.

- It does not give EPA or states the authority to compel facilities to incorporate prevention practices into their operations, although such activities can be included in enforcement settlements to ensure dischargers' compliance with permit requirements.
- It does not authorize the use of fees or taxes to promote pollution prevention. As a result, EPA has had to rely on states and industries to voluntarily implement prevention strategies in their operations, and many have been reluctant to do so.
- It is specific to water pollution and does not address multimedia pollution or the transfer of pollution between environmental media. For example, a facility that stops discharging pollution water through end-of-pipe wastewater discharges may transfer and release harmful pollutants through another medium, such as the atmosphere, from the incineration of manufacturing wastes.

EPA regional and headquarters officials, as well as some state officials, told us that an added emphasis on prevention in the CWA could go a long way toward instituting effective prevention practices at the federal, state, and industry levels. As discussed in the following section, a broader national effort to encourage greater use of AFMs could also be designed to further promote pollution prevention practices.

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## **Encouraging Greater Use of Alternative Financing Mechanisms and Prevention Practices**

One alternative to encourage greater use of both AFMs and toxic water pollution prevention practices could be to require, on a nationwide basis, the use of pollutant-based fees or taxes on dischargers. Such a national requirement would (1) help raise revenue to support essential pollution control programs and activities and (2) serve as an incentive for industries to reduce or eliminate their toxic discharges.

As noted earlier, at least 30 states use AFMs to generate additional revenue for their water quality programs. Also, EPA is trying to encourage wider use of these mechanisms by publicizing their usefulness in helping to deal with existing funding problems. However, encouragement alone is likely to do little to close the enormous and growing gap between program needs and available resources because some states officials are concerned that the added cost of pollution control could lead industries to relocate to other states. A nationwide requirement whereby all states implement such a mechanism would help to remove this economic disincentive.

The 1990 amendments to the Clean Air Act authorize establishment of a fee system as part of a nationwide air permit program. This law requires



dischargers to pay an annual fee or the equivalent for discharging toxic pollutants. The fee, which can increase each year, must be sufficient to cover all reasonable direct and indirect costs required to develop and administer the permit program. EPA must promulgate regulations for implementing the system and determining reasonable program costs. States will collect the fees.

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## **Conclusions**

As the cost of environmental protection continues to increase, the gap between program costs and available resources is expected to widen. To deal with resource constraints, EPA and states need to seek alternative ways to generate additional revenue for their water pollution programs. At least 30 states are using alternative financing mechanisms to support their water programs; however, in some states, the amount of funds generated represents only a small fraction of the revenue needed and is not necessarily dedicated to specific water program activities. More importantly, several barriers currently prevent states from using or placing greater reliance on such mechanisms.

Even when corrective actions are taken to address toxic pollution problems, there are limits to how effectively pollution programs can control toxic discharges. Accordingly, EPA and a few states and industries are emphasizing the use of innovative techniques to prevent toxic discharges to the nation's waters. Here, too, a number of barriers currently discourage greater use of the preventive approach.

We believe that a national pollutant-based fee system, if properly designed, could help to generate additional revenue to support EPA's and states' toxic pollution control efforts. It could also encourage greater use of innovative pollution prevention techniques and eliminate barriers currently hindering greater use of these approaches. While we have not evaluated all implications of the fee system authorized by the Clean Air Act Amendments of 1990, we believe that a similar national requirement focusing on toxic pollution would go a long way toward resolving many of the problems currently hindering effective implementation of water pollution programs.

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**Matter for  
Consideration by the  
Congress**

In light of existing resource constraints and barriers hindering greater use of innovative approaches to financing water pollution programs and preventing toxic discharges to the nation's waters, the Congress may wish to consider directing EPA to develop a pollutant-based discharger fee system that would (1) generate additional revenue for water pollution programs and (2) serve as an incentive for dischargers to use pollution prevention techniques to reduce or eliminate their toxic discharges.



# National Summary of Identified Impaired Waters by State (as of March 31, 1991)

	304(l) Long list			304(l) Short list			304(l) Facilities list		
	Total submitted by state	No. of EPA additions/deletions	Total	Total submitted by state	No. of EPA additions/deletions	Total	Total submitted by state	No. of EPA additions/deletions	Total
<b>Region I</b>									
Conn.	182	0/0	182	20	0/1	19	29	0/0	29
Maine	75	0/0	75	8	0/0	8	10	0/0	10
Mass.	29	0/0	29	16	2/1	17	19	2/1	20
N.H.	53	0/0	53	1	0/0	1	1	0/0	1
R.I.	33	0/0	33	1	0/0	1	3	0/0	3
Vt.	241	0/0	241	0	0/0	0	0	0/0	0
<b>Region II</b>									
N.J.	72	0/0	72	9	1/0	10	31	37/2	66
N.Y.	758	0/0	758	6	9/0	15	5	46/24	27
P.R.	275	0/0	275	11	0/1	10	12	0/1	11
V.I.	23	0/0	23	0	0/0	0	0	0/0	0
<b>Region III</b>									
D.C.	32	0/0	32	2	0/1	1	3	0/2	1
Del.	22	0/0	22	5	0/0	5	10	0/2	8
Md.	83	5/0	88	25	12/13	24	23	15/14	24
Pa.	649	0/0	649	100	9/62	47	181	9/124	66
Va.	140	20/5	155	11	32/11	32	11	32/5	38
W.Va.	2,608	0/0	2,608	3	0/1	2	3	0/1	2
<b>Region IV</b>									
Ala.	327	1/3	325	15	0/10	5	16	0/11	5
Fla.	605	0/0	605	3	5/1	7	4	5/1	8
Ga.	70	233/0	303	20	17/11	26	18	16/9	25
Ky.	353	2/0	355	22	2/3	21	22	2/3	21
Miss.	527	2/0	529	10	0/1	9	10	0/1	9
N.C.	382	35/0	417	4	7/0	11	4	7/0	11
S.C.	242	6/0	248	20	0/3	17	19	0/3	16
Tenn.	269	10/0	279	17	0/3	14	13	0/3	10
<b>Region V</b>									
Ill.	1,069	0/0	1,069	7	0/1	6	6	0/1	5
Ind.	527	0/0	527	32	4/0	36	37	4/0	41
Mich.	256	0/0	256	17	0/0	17	18	0/0	18
Minn.	1,140	0/0	1,140	3	1/0	4	3	1/0	4
Ohio	805	0/0	805	23	5/1	27	25	5/1	29
Wis.	1,124	0/0	1,124	9	3/2	10	10	3/2	11
<b>Region VI</b>									
Ark.	126	10/0	136	0	7/0	7	0	5/0	5

(continued)

**Appendix I  
National Summary of Identified Impaired  
Waters by State (as of March 31, 1991)**

	304(l) Long list			304(l) Short list			304(j) Facilities list		
	Total submitted by state	No. of EPA additions/deletions	Total	Total submitted by state	No. of EPA additions/deletions	Total	Total submitted by state	No. of EPA additions/deletions	Total
La.	48	9/0	57	7	7/0	14	3	6/0	9
N.Mex.	236	0/0	236	0	3/0	3	0	3/0	3
Okla.	297	11/0	308	2	2/0	4	1	1/0	2
Tex.	52	11/0	63	7	6/7	6	0	9/0	9
<b>Region VII</b>									
Iowa	54	0/0	54	8	0/0	8	11	0/0	11
Kans.	922	0/0	922	2	0/0	2	2	0/0	2
Mo.	151	0/0	151	4	0/0	4	4	0/0	4
Nebr.	89	0/0	89	0	0/0	0	0	0/0	0
<b>Region VIII</b>									
Colo.	96	0/0	96	11	1/0	12	11	1/0	12
Mont.	320	0/0	320	1	0/0	1	1	0/0	1
N.Dak.	24	59/0	83	0	0/0	0	0	0/0	0
S.Dak.	153	0/0	153	0	0/0	0	0	0/0	0
Utah	0	133/0	133	0	8/2	6	0	8/2	6
Wyo.	487	1/0	488	26	1/2	25	56	3/7	52
<b>Region IX</b>									
Calif.	130	375/0	505	12	7/3	16	17	15/3	29
Hawaii	21	0/0	21	0	0/0	0	0	0/0	0
Nev.	10	0/0	10	1	0/0	1	1	0/1	0
Guam	7	0/0	7	0	0/0	0	0	0/0	0
Samoa	3	0/0	3	0	0/0	0	0	0/0	0
CNMI <sup>a</sup>	2	0/0	2	0	0/0	0	0	0/0	0
Ariz.	165	1/1	165	3	3/1	5	3	4/1	6
<b>Region X</b>									
Alaska	35	112/0	147	1	0/0	1	1	0/0	1
Idaho	885	0/0	885	0	2/0	2	0	2/0	2
Oreg.	233	0/0	233	3	0/0	3	3	0/0	3
Wash.	225	1/0	226	13	1/7	7	93	1/84	10
<b>Total</b>	<b>17,742</b>	<b>1,037/9</b>	<b>18,770</b>	<b>521</b>	<b>157/148</b>	<b>529</b>	<b>253</b>	<b>242/309</b>	<b>686</b>

Source: EPA's 304(l) Program Summary, March 31, 1991.

<sup>a</sup> Commonwealth of the Northern Mariana Islands.

# Industrial Categories Covered by National Effluent Guidelines

Aluminum forming <sup>a</sup>	Metal finishing <sup>a</sup>
Asbestos manufacturing <sup>a</sup>	Metal molding and casting <sup>a</sup>
Battery manufacturing <sup>a</sup>	Mineral mining and processing
Builder's paper and board mills <sup>a</sup>	Nonferrous metals forming and metal powders <sup>a</sup>
Carbon black manufacturing <sup>a</sup>	Nonferrous metals manufacturing <sup>a</sup>
Cement manufacturing <sup>a</sup>	Oil and gas extraction
Coal mining <sup>a</sup>	Ore mining and dressing <sup>a</sup>
Coil coating <sup>a</sup>	Organic chemicals, plastics and synthetic fibers <sup>a</sup>
Copper forming <sup>a</sup>	Paint formulation <sup>a</sup>
Dairy products processing	Paving and roofing materials <sup>a</sup>
Electrical and electronics components <sup>a</sup>	Pesticide chemicals <sup>a</sup>
Electroplating	Petroleum refining <sup>a</sup>
Explosives manufacturing	Pharmaceutical manufacturing <sup>a</sup>
Feedlots <sup>a</sup>	Phosphate manufacturing <sup>a</sup>
Ferroalloy manufacturing <sup>a</sup>	Photographic
Fertilizer manufacturing <sup>a</sup>	Plastic molding and forming <sup>a</sup>
Fruits and vegetables processing	Porcelain enameling <sup>a</sup>
Glass manufacturing	Pulp, paper and paperboard <sup>a</sup>
Grain mills manufacturing	Rubber manufacturing <sup>a</sup>
Gum and wood chemical manufacturing	Seafood processing
Hospitals	Soap and detergent manufacturing <sup>a</sup>
Ink formulating <sup>a</sup>	Steam electric power generating <sup>a</sup>
Inorganic chemicals <sup>a</sup>	Sugar processing
Iron and steel manufacturing <sup>a</sup>	Textile mills <sup>a</sup>
Leather tanning and finishing <sup>a</sup>	Timber products processing
Meat products	

<sup>a</sup>Indicates guidelines specifically aimed at controlling toxic pollutants.

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