

GAO

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

April 1993

# DRINKING WATER

## Stronger Efforts Needed to Protect Areas Around Public Wells From Contamination



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**United States  
General Accounting Office  
Washington, D.C. 20548**

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

B-251782

April 14, 1993

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

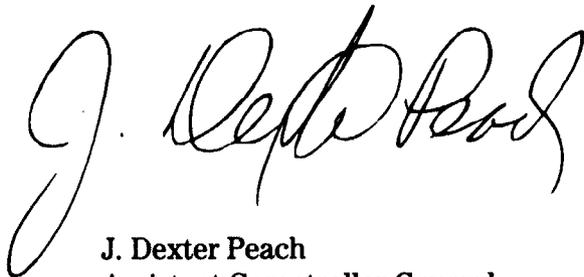
Dear Mr. Chairman:

As requested, we have reviewed the Environmental Protection Agency's (EPA) and states' efforts to implement the wellhead protection (WHP) requirements that are set forth in the 1986 amendments to the Safe Drinking Water Act. Under the WHP Program, each state is required to develop a systematic and comprehensive program to protect wellhead areas surrounding public drinking water supplies from contaminants that can harm human health. This report discusses (1) the barriers hindering the development and implementation of states' WHP programs and (2) the options available to deal with these barriers.

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 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) 512-6111 if you or your staff have any questions. Major contributors to this report are listed in appendix II.

Sincerely yours,



**J. Dexter Peach  
Assistant Comptroller General**

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# Executive Summary

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## Purpose

Over 50 percent of the nation's population relies on groundwater as its primary source of drinking water. However, in recent years, groundwater has been threatened or contaminated by harmful pollutants discharged by various sources into areas surrounding drinking water wells, often referred to as wellhead protection (WHP) areas. As a result, some communities have had to close their drinking water wells permanently or pay tens of millions of dollars in cleanup costs.

Concerned about the Environmental Protection Agency's (EPA) and states' progress in implementing the program intended to prevent the contamination of WHP areas, the Chairman, Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, asked GAO to examine (1) the barriers hindering the development and implementation of states' WHP programs and (2) the options available to deal with these barriers.

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## Background

The 1986 amendments to the Safe Drinking Water Act established the WHP Program to protect surface and subsurface areas surrounding public drinking water wells from contaminants that may adversely affect human health. The amendments required states to develop and submit their WHP programs to EPA by June 19, 1989. At a minimum, each program was required to specify the roles and duties of state and local governments and public water systems, define each WHP area, identify within each WHP area all potential sources of contamination, describe management approaches to be used to protect water supplies, include contingency plans for alternate water supplies, and include requirements for considering potential sources of contamination when siting new wells. Although authorized, funds have not been appropriated under the 1986 amendments for states' WHP programs.

Although the amendments required each state to have a WHP program, they did not give EPA the authority to develop a program for nonparticipating states or to impose sanctions against them. Rather, EPA's role primarily involves issuing technical guidance to assist states with their WHP programs and approving or disapproving the programs. The responsibilities of local governments depend largely on the specific requirements of their state's program.

In a broader context, EPA adopted a groundwater protection strategy in July 1991 that may have implications for the WHP Program. This strategy (1) emphasizes preventing contamination (as does the WHP Program) as

the most effective way to protect drinking water and avoid substantial cleanup costs and (2) encourages each state to integrate all federal, state, and local efforts to protect groundwater—including the state's WHP program—into a “comprehensive state groundwater protection program.” EPA issued guidance in January 1993 to assist states in developing their comprehensive programs.

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## Results in Brief

Several barriers hinder states' efforts to develop and implement WHP programs, including (1) opposition at the local level against states' enactment of land-use controls and (2) a general lack of public awareness about the vulnerability of drinking water to contamination and about the need to protect wellhead areas. However, EPA and state officials identified a severe shortage of funds as the underlying cause of these barriers and the primary problem affecting states' WHP programs. This shortage also contributes to the lower priority accorded the WHP programs, even though the programs' objective is fully consistent with EPA's stated policy of emphasizing the prevention, rather than the remediation, of groundwater contamination.

One option to alleviate the funding barrier is for states to integrate their WHP programs with their comprehensive programs. According to EPA and state officials, the comprehensive programs will encourage states to set priorities across all groundwater-related programs. The officials maintain that integrating WHP into this process could lead to increased priority, funding, and managerial attention for WHP programs in many states. This integration, however, is only a partial solution at best, particularly in light of the overall scarcity of funding available for groundwater protection activities. Accordingly, GAO believes that a further enhancement would be for EPA and the Congress to reassess the absence of federal appropriations for WHP programs, in light of their preventive orientation and focus on protecting precious drinking water supplies.

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## Principal Findings

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### Barriers Hindering WHP Programs

Over 3 years after the June 1989 statutory deadline for submitting WHP programs to EPA, only 26 states have approved programs. Moreover, according to EPA regional officials, none of these states has completed all of the key elements expected of an approvable program, as defined by the

**Safe Drinking Water Act; in particular, no state has completed the task of defining all of its WHP areas. Of the remaining 24 states, 21 are developing programs and 3 have no plans to do so.**

**Among the barriers hindering states' development and implementation of WHP programs is local opposition against states' efforts to control, at the local level, land uses that often cause contamination. Although most of the EPA and state officials GAO interviewed generally agreed that some form of land-use controls is needed to prevent contamination in wellhead areas, none of the five states contacted has exerted its authority to institute such measures. EPA and state officials said that states do not exert such authority because they view controlling land uses as a controversial issue that should be addressed by local governments.**

**GAO found that one effective way to alleviate the reluctance to institute local land-use controls, and similar regulatory controls, is to increase public awareness about the risks contaminated groundwater may pose to drinking water supplies. For example, in the 1980s officials in Florida's Dade and Broward counties undertook extensive outreach efforts to educate the general public and elected officials about the need to control land uses to protect drinking water supplies, and subsequently, both counties enacted stringent land-use controls that prohibit locating new industrial facilities in wellhead areas.**

**EPA officials noted that such outreach efforts are crucial because the public is much more willing to support controversial land-use decisions and preventive programs, such as WHP programs, if it understands the adverse health and economic consequences associated with contaminated drinking water. Nevertheless, EPA and state officials unanimously acknowledged that efforts to educate state and local politicians and the general public about the consequences of groundwater contamination are limited because of severe funding constraints.**

**Similarly, technical data on the risk or extent of groundwater contamination are also needed to delineate WHP areas and identify sources of contamination. However, a paucity of such data exists in most states. According to the EPA and state officials interviewed, states often lack the technical staffing, expertise, and resources needed to develop essential data about the characteristics of aquifers, the flow of the groundwater, and reactions of chemicals and other contaminants detected in the groundwater.**

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## Options for Dealing With the Funding Problem

As a result of severe funding constraints, WHP programs are generally given lower priority than other programs mandated and funded by law, although WHP programs are directly associated with protecting the health of the nation's drinking water. According to nearly all of the EPA and state officials interviewed, integrating WHP programs with states' comprehensive groundwater protection programs would help the WHP programs compete with other programs for the limited groundwater protection funds available to the states. EPA headquarters officials explained that WHP areas are, by definition, high-priority areas because they involve drinking water supplies vulnerable to contamination. The agency issued guidance in January 1993 encouraging such integration.

Nevertheless, this integration alone will not completely resolve the funding problem. For one thing, some of the programs and activities included in states' comprehensive programs, such as conducting water system inspections, have been underfunded. Rather, GAO believes that a practical response to the funding problem—and one that is wholly consistent with EPA's policies and recent GAO reports<sup>1</sup> emphasizing preventing pollution and setting risk-based priorities—is for EPA and the Congress to consider whether the budgetary priority given the WHP Program is consistent with the program's overall purposes of (1) preventing contamination rather than cleaning it up after it occurs and (2) protecting drinking water supplies from contamination.

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## Recommendations

GAO recommends that the Administrator, EPA, (1) work with states to determine minimum funding levels needed to implement their WHP programs and then (2) work with the cognizant congressional committees during the fiscal year 1994 budget process to identify the minimum funding levels needed to implement the program nationwide.

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## Agency Comments

GAO discussed the findings in this report with officials in EPA's Office of Ground Water and Drinking Water, who generally agreed with the information presented. Their comments were incorporated where appropriate. However, as agreed, GAO did not obtain written agency comments.

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<sup>1</sup>Water Pollution: More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater (GAO/RCED-92-47, Dec. 30, 1991); Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

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## Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
PWSS	public water supply supervision
WHP	wellhead protection



# Introduction

Over 50 percent of the nation's population relies on groundwater as its primary source of drinking water. Until two decades ago, groundwater was believed to be protected naturally from contamination that can be dangerous to human health and the environment. Since that time, however, it has been learned that groundwater has been threatened by contamination resulting from a variety of commercial, industrial, residential, and agricultural activities. These sources of contamination include leaking underground storage tanks, hazardous waste landfills, septic tanks, and pesticide runoff from agricultural activities. The areas surrounding drinking water wells are particularly vulnerable because contaminants discharged within what is known as a water well's recharge area may be drawn toward that well.

As we have discussed in previous GAO reports,<sup>1</sup> the nature of groundwater makes it difficult and, in some instances, impossible to clean up once contamination occurs. Furthermore, cleaning up contaminated groundwater can cost millions of dollars and take many years to complete. Therefore, the most cost-effective approach for protecting groundwater used for drinking water is to prevent contamination before it occurs.

## Groundwater Contamination's Adverse Effect on Public Drinking Water

Nationwide, the actual number of drinking water wells closed each year because of groundwater contamination is not known. However, a number of contamination incidents adversely affecting drinking water have been reported to the Environmental Protection Agency (EPA) in recent years. In some cases, public water systems have had to issue notices advising consumers to boil their water before using it. Some communities have had their drinking water wells closed permanently or have had to undertake very technical and expensive cleanup measures. For example, in 1992, EPA reported that a community in New Jersey had to abandon its municipal wellfield, which consisted of 10 public drinking water wells, because of contamination from a Superfund site. The community had to build 10 new wells, which cost about \$5 million, or \$500,000 per well.

In another example, in 1982, Dade County, Florida, officials had to permanently close six public drinking water wells serving about 300,000 residents because of contamination resulting from organic chemicals discharged in areas near the wells. Between 1983 and 1992, county officials had to undertake massive efforts to construct 15 new wells,

<sup>1</sup>Groundwater Protection: Validity and Feasibility of EPA's Differential Protection Strategy (GAO/PEMD-93-6, Dec. 9, 1992); Groundwater Protection: Measurement of Relative Vulnerability to Pesticide Contamination (GAO/PEMD-92-8, Oct. 31, 1991); Water Pollution: More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater (GAO/RCED-92-47, Dec. 30, 1991).

replacing the closed wells, and to clean up 19 other public wells contaminated during this period. Construction costs for the new wells totaled over \$13 million, or an average of over \$800,000 per well. In addition, the treatments used to clean up the 19 other contaminated wells were costly—totaling over \$39 million. Beginning in 1992, the county will also have to pay an additional \$2-1/2 million annually to cover operations and maintenance costs for treating water pumped from the previously contaminated wells.

In general, once wells are contaminated, the costs of obtaining alternate water sources are very substantial, particularly when the only feasible alternatives to treating contaminated groundwater are to drill new wells, install new distribution systems, or connect water system users to other existing wells. For instance, in 1991, EPA reported, after reviewing the records of cleanup activities at 40 Superfund sites where public water supplies were affected, that in instances in which these alternatives were used to supply water to affected communities, costs ranged from \$70,000 to over \$2.3 million, depending on the extent of the contamination and the population served. In addition, EPA reported that these costs represented one of the biggest expenditures for municipalities.

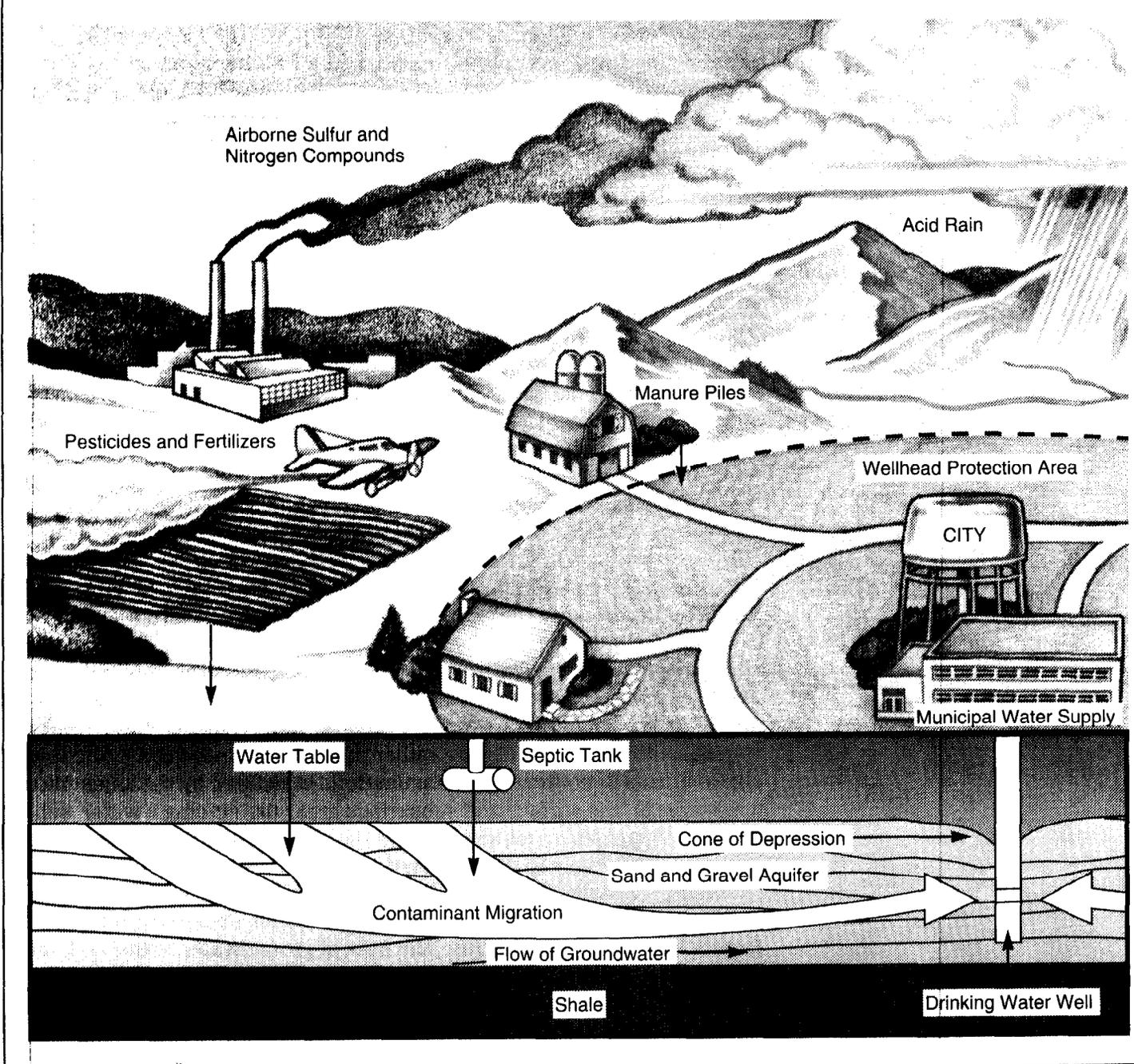
## Requirements of the Wellhead Protection Program

The Safe Drinking Water Act's amendments of 1986 established the Wellhead Protection (WHP) Program, under which each state was required to develop and implement a systematic and comprehensive program to protect wellhead areas within the state's jurisdiction from contaminants that may adversely affect human health. Unlike other environmental programs, the WHP Program focuses on preventing contamination from all sources within a wellhead area, rather than only addressing a limited set of contaminants or sources of contamination. As defined by the amendments, a WHP area is "the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield."<sup>2</sup> (See fig. 1.1.) States determine the boundaries of their WHP areas; these determinations vary from well to well, depending on such factors as a well's pumping rate, the flow of groundwater to the well, the type and boundary of the aquifer, and the goals of individual states' WHP programs.<sup>3</sup>

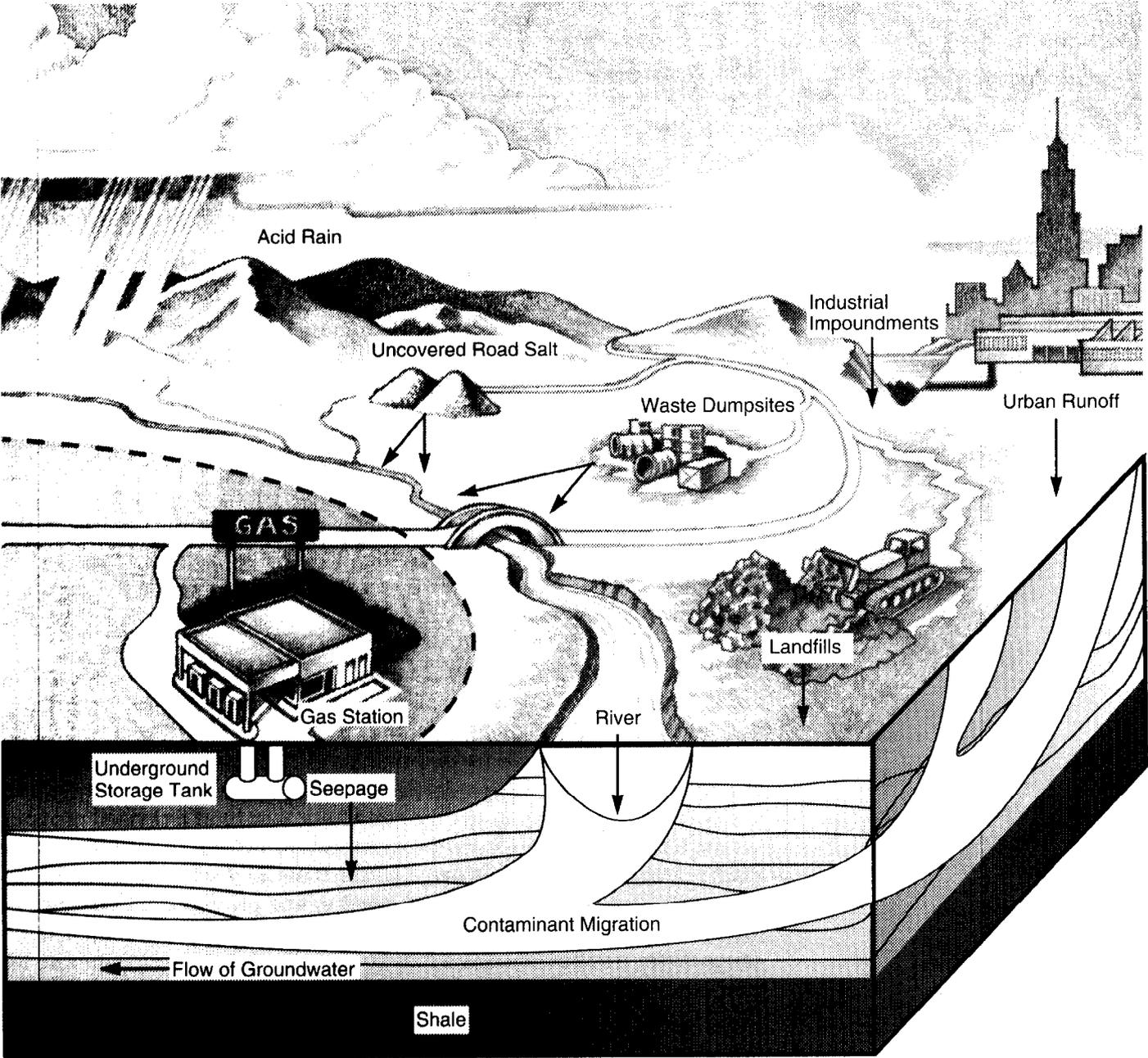
<sup>2</sup>A wellfield is an area containing two or more wells supplying a public water system.

<sup>3</sup>An aquifer is any geologic formation that contains sufficient quantities of groundwater to supply drinking water wells. The types of aquifers vary depending on the geologic formation.

Figure 1.1: Example of a WHP Area



**Chapter 1  
Introduction**



Source: Based on an illustration from EPA's Ground Water Protection Division.

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The 1986 amendments required states to develop and submit their WHP programs to EPA by June 19, 1989. At a minimum, these programs were required to

- specify the roles and responsibilities of state and local entities and public water systems;
- define each WHP area;
- identify within each WHP area all potential sources of contamination;
- describe the management approaches (including technical and financial assistance, control measures, education, training, and demonstration projects) to be used to protect water supplies;
- include contingency plans for providing alternate supplies of drinking water in the event that a well or wellfield becomes contaminated; and
- include a requirement that consideration be given to all potential sources of contamination within any area expected to be a WHP area of a new water well serving a public water system.

In addition, the law required states to (1) solicit and consider the public's input when defining their WHP areas and developing their programs and (2) submit a biennial status report to EPA describing their progress in implementing the WHP programs. Beyond these minimum requirements, EPA gave states considerable flexibility in tailoring their programs to accommodate their own unique features and needs and the option of making local participation in their programs mandatory or voluntary.<sup>4</sup>

In addition to requiring EPA to issue technical guidance to assist states in developing their WHP programs, including methods for delineating their WHP areas, the law gave EPA the authority to approve or disapprove states' programs. The law also provided that once EPA approves a program, the state is then eligible to apply for federal funds to implement the program. If EPA disapproves a program, the state must resubmit a revised program within 6 months. A state's WHP program can be deemed adequate if EPA does not approve or disapprove it within 9 months after receiving it. Although all states are required to develop WHP programs, EPA has no authority under the 1986 amendments to (1) develop or implement a program for a state if the state fails to do so on its own or (2) impose any sanctions against a state for not complying with the law.

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<sup>4</sup>According to the Acting Chief of the Technical and Information Management Branch, who was responsible for overseeing WHP efforts at EPA headquarters, a mandatory program requires local governments and, in some instances, public water systems to develop and implement individual WHP programs that adhere to the requirements contained in a state's WHP program. On the other hand, a voluntary program gives local governments the option of participating in it.

Local entities' responsibilities for implementing WHP programs vary among states and largely depend on the specific requirements of individual states' programs. For instance, some states have the responsibility for delineating all WHP areas, while others have delegated or plan to delegate this responsibility to localities or public water systems.

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## States' Comprehensive Programs for Protecting Groundwater

In July 1991, EPA adopted a new groundwater protection strategy that stresses preventing contamination and having states develop comprehensive groundwater protection programs. Ultimately, EPA hopes these voluntary programs will integrate all federal, state, and local groundwater protection programs and activities—including WHP programs—within the states and serve as focal points for a long-term commitment between EPA and the states to achieve a more coherent and comprehensive approach for protecting groundwater. EPA plans to review the comprehensive programs to ensure that they adequately protect groundwater.

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## Objectives, Scope, and Methodology

As requested by the Chairman, Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, we examined (1) the barriers hindering the development and implementation of states' WHP programs and (2) the options available for dealing with these barriers.

We performed our audit work at the Office of Ground Water and Drinking Water at EPA headquarters, in Washington, D.C., and the EPA regional office in Atlanta, Georgia. We also conducted telephone interviews with groundwater and drinking water officials in the other nine EPA regional offices. In addition, we contacted groundwater and drinking water officials in five states—California, Connecticut, Florida, Iowa, and New Mexico—and four localities—Santa Fe, New Mexico; Southington, Connecticut; and Fort Lauderdale (Broward County) and Miami (Dade County), Florida. We selected these states and localities on the basis of a number of factors, including their reliance on groundwater for drinking water and the status of their efforts to develop and implement WHP programs. We also interviewed representatives of environmental and public interest groups, such as the Association of State and Interstate Water Pollution Control Administrators, the League of Women Voters, and the National Rural Water Association.

To address our first objective, we obtained nationwide data at EPA headquarters on the status of states' efforts to develop WHP programs. We also reviewed pertinent federal, state, and local regulations, guidance, and other documents to obtain a thorough understanding of the WHP requirements set forth by the Congress, EPA, states, and localities. We then interviewed officials at the federal, state, and local levels to (1) confirm our understanding of the WHP requirements, (2) obtain views and documentation on barriers hindering the development and implementation of WHP programs, and (3) gather information on efforts and options available to eliminate or minimize the barriers.

To address the second objective, we reviewed EPA's guidance for developing comprehensive state programs to (1) identify key components of the programs, (2) determine how WHP programs will fit into the comprehensive programs, and (3) identify effects the programs may have on the development and implementation of states' WHP programs. We also interviewed officials at EPA headquarters and regional offices and state offices to obtain information on the status of their efforts to develop the comprehensive state programs and to solicit their views on how barriers impeding WHP efforts may be addressed through the comprehensive programs.

Our review was conducted from November 1991 through February 1993 in accordance with generally accepted government auditing standards. During our review, we discussed our audit findings with the Deputy Director of EPA's Ground Water Protection Division and other officials within the Office of Ground Water and Drinking Water who are responsible for implementing the WHP Program. The officials generally agreed with the factual information presented, and their comments have been incorporated where appropriate. As agreed with the requester's office, we did not obtain written agency comments on a draft of this report.

# Barriers Hindering States' Efforts to Develop and Implement Wellhead Protection Programs

Over 3 years after the June 1989 statutory deadline for submitting WHP programs to EPA, only 26 states have approved programs. Moreover, according to EPA regional officials, none of these states has, for a variety of reasons, completed all of the key elements expected of an approvable program, as defined by the Safe Drinking Water Act; in particular, no state has completed the task of delineating all of its WHP areas. Of the remaining 24 states, 21 are developing WHP programs, and 3 have no plans to develop programs, according to EPA officials.

We found that several barriers hinder states' efforts to develop and implement WHP programs. These barriers include (1) states' reluctance to enact land-use controls at the local level, which are often necessary to prevent contamination; (2) a general lack of public awareness about the need to protect wellhead areas; and (3) a shortage of the technical data and expertise necessary to properly delineate WHP areas and identify sources of contamination. The key problem underlying these barriers, however, is the severe shortage of funding for WHP programs. This shortage also contributes to the lower priority accorded WHP programs by states and EPA—even though the programs' purpose is fully consistent with the agency's stated policy, which emphasizes the prevention rather than remediation of groundwater contamination.

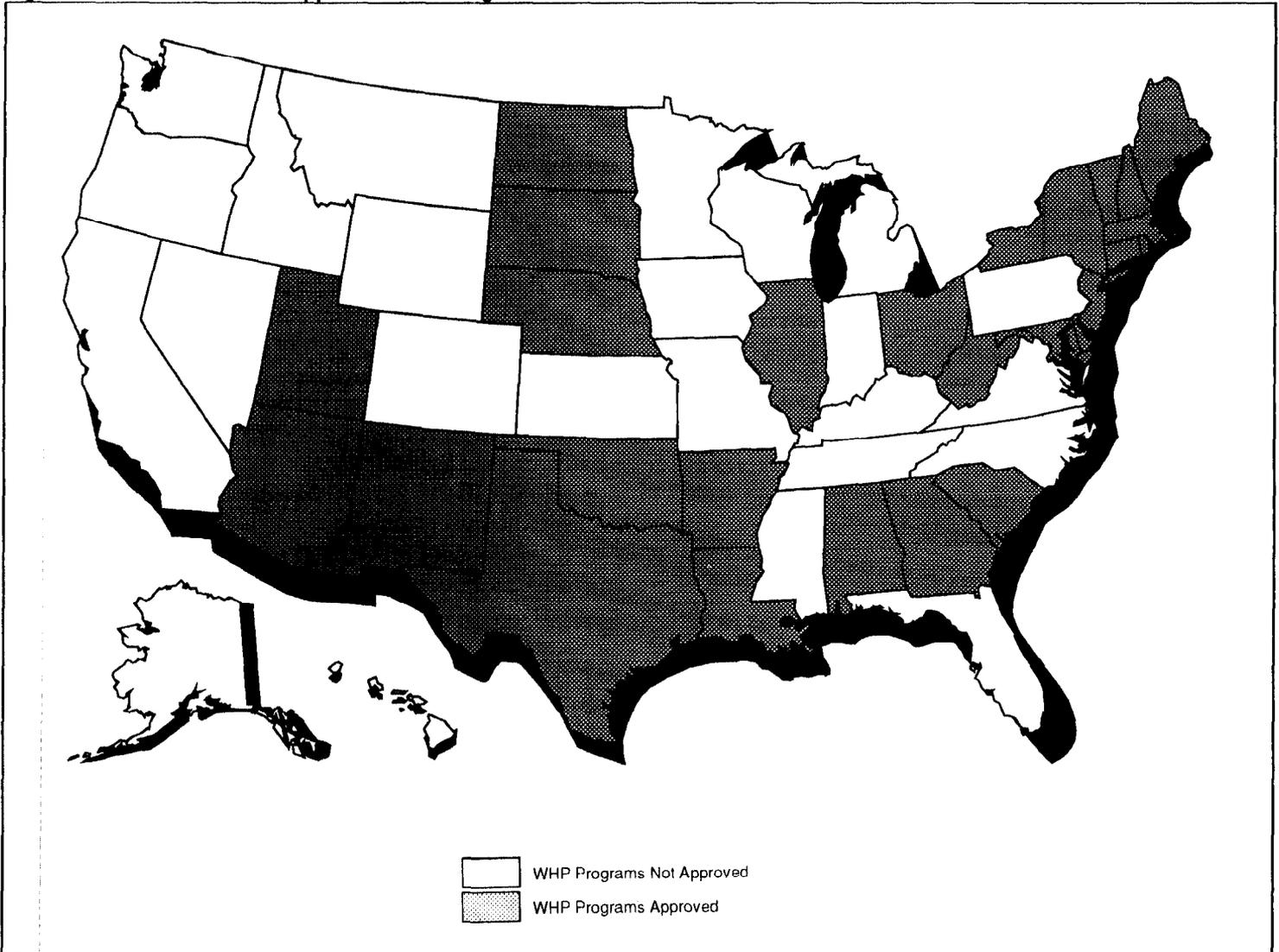
## States Are Slowly Developing and Implementing WHP Programs

Over 3 years after the June 19, 1989, statutory deadline, only 26 states and one territory have EPA-approved WHP programs (see fig. 2.1). Moreover, none of these states nor the territory has completed all of the key elements expected of an approvable program, as defined by the Safe Drinking Water Act. For example, EPA officials told us that no state has delineated all of its wellhead areas and identified all actual and potential sources of contamination. The state officials interviewed confirmed what the EPA officials told us.

Furthermore, EPA regional officials told us that they are currently working with at least 21 states and several territories to develop WHP programs and hope to have most of these programs approved by the fall of 1994. These officials noted that officials in Alaska, California, and Virginia have indicated no plans to develop WHP programs for a variety of reasons, many of which are discussed later in this chapter.

**Chapter 2  
Barriers Hindering States' Efforts to  
Develop and Implement Wellhead  
Protection Programs**

**Figure 2.1: States With EPA-Approved WHP Programs**



Source: Based on data from EPA's Ground Water Protection Division.

**Some Localities Have  
Initiatives Under Way to  
Protect Wellhead Areas**

Though states are having difficulty in developing WHP programs or completing key elements of their approved programs, we found that some local governments have undertaken initiatives to establish WHP programs and designate WHP areas, even in states without EPA-approved programs. According to the EPA, state, and local officials interviewed, the local

governments undertook the initiatives because they recognized that preventing groundwater contamination is the most cost-effective way to protect their drinking water and to avoid paying substantial cleanup or construction costs. Florida's Dade and Broward counties, for example, have had programs in place since the 1980s to protect their communities' drinking water. Under these programs, new businesses that generate hazardous materials are restricted from operating within designated WHP areas. Existing businesses that are allowed to operate in the areas must obtain permits, comply with stringent hazardous waste regulations, and be inspected regularly. Facilities found violating these requirements could receive fines totaling up to \$15,000 a day. During the initial phase of its program, Broward County officials paid at least eight businesses over \$383,000 to relocate outside designated WHP areas.

In another instance, officials in Jefferson County, Wisconsin, enacted a zoning ordinance in 1975 to protect the county's water supplies. The ordinance requires owners to obtain permits to locate animal feeding operations in certain areas. The permits are used to ensure that livestock and poultry feeding operations are compatible with planned uses of the land and to prevent wastes from entering groundwater.

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## **Several Barriers Hinder WHP Programs' Development and Implementation**

Among the major barriers hindering states' efforts to develop and implement WHP programs are (1) states' reluctance to institute land-use and other regulatory controls at the local level; (2) the general lack of public awareness about the importance of and need for protecting areas surrounding drinking water wells; and (3) a shortage of technical data and expertise to, among other things, make determinations about the vulnerability of groundwater that are necessary to properly delineate WHP areas. However, the EPA and state officials interviewed unanimously identified a severe shortage of funds as the single most significant barrier hindering WHP programs and the primary underlying cause of the other problems.

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## **Reluctance to Institute Land-Use and Other Regulatory Controls**

Most of the EPA and state officials interviewed generally agreed that some form of land-use and regulatory controls is needed to prevent contamination in WHP areas and should, therefore, be an integral part of WHP programs. These officials emphasized that these measures not only allow states and localities to control activities in vulnerable areas, but also give them power to take enforcement actions against violators.

As noted in our October 1990 report on state and local efforts to control pollution from "nonpoint" sources, or diffuse sources such as farming, mining, and construction activities, states have the authority to control the uses of land in their jurisdictions.<sup>1</sup> However, as we also noted in that report, exercising this authority tends to be an exceedingly contentious political issue. Some of the EPA and state officials interviewed for this report told us that states do not exert their authority to enact land-use controls because such controls are a very controversial issue, which should be addressed by local governments. Furthermore, some of the EPA and state officials interviewed told us that trying to control the uses of land oftentimes creates resentment and bad feelings among landowners, facility owners and operators, and state and local officials, particularly if these groups have not been convinced that their drinking water is contaminated or at risk from potential sources of contamination.

EPA officials also commented that farmers traditionally resist regulations governing how they should farm their land because such regulations could adversely affect their livelihood. Some officials believed that some local industries, which are often major employers in small communities, would resist such regulations and possibly relocate elsewhere, thereby creating economic hardships for many communities. In addition, the officials commented that many citizens believe that land-use controls would decrease the value of their properties.

During our review, we found that none of the five states contacted has exercised its authority to enact land-use controls at the local level. However, Connecticut officials stated that they have drafted legislation that would require local governments to use state-developed regulations to establish local land-use restrictions. Under these regulations, the state proposes, for example, that no gasoline stations be located within WHP areas. Also, facilities already operating within the designated areas would be subject to very stringent monitoring and reporting requirements.

Connecticut officials explained that they were able to proceed with developing land-use measures because they had compiled information on groundwater contamination problems. For example, state officials had compiled information showing that since 1980, more than 1,300 wells had been contaminated, thus affecting the water supplies of an estimated 255,000 people. Through extensive public outreach efforts, the officials were able to use the data to convince the public and lawmakers about the

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<sup>1</sup>Water Pollution: Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution (GAO/RCED-91-10, Oct. 15, 1990).

seriousness of the contamination and about the need to institute some form of land-use controls to protect drinking water.

In a similar fashion, two Florida localities, Broward and Dade counties, undertook initiatives in the 1980s to institute stringent land-use controls as part of the counties' WHP programs. In each case, new facilities are prohibited from operating within a specified distance of public drinking water wells or recharge areas. Existing facilities are monitored very closely and inspected frequently to ensure compliance with established requirements. Under Dade County's program, once an existing facility ceases operation in a WHP area for whatever reason, a new facility of the same type cannot begin operation at that location. Violators of the requirements of each county's WHP program are subject to stiff penalties and enforcement actions, such as the closure of the violators' operations. Here, too, the impetus for these counties' stringent controls stemmed from the local officials' ability to document contamination problems caused by activities occurring in or near areas surrounding drinking water wells and the extensive outreach efforts by these officials to publicize and gain support for controlling the uses of land in their jurisdictions.

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### **Lack of Public Awareness About WHP Programs**

Just as the public and lawmakers are often unaware of the seriousness of contamination and the need to control land uses, they are also often unaware of the role WHP programs can play in preventing groundwater contamination. The majority of the EPA and state officials interviewed agreed that there is, for the most part, a lack of information about the vulnerability of drinking water to contamination and about the adverse health and economic effects associated with such contamination. As a result, the general public and lawmakers have a false sense of security about the quality of their drinking water. Officials in EPA headquarters and in Iowa further explained that this lack of awareness stems, in part, from the fact that the risks associated with groundwater contamination are far more subtle than those associated with other environmental media, such as polluted air from an incinerator or hazardous substances buried in landfills.

Recognizing the need to increase public awareness, EPA officials told us that many states have expressed a desire to increase efforts to educate their citizens about the need to protect wellhead areas and to encourage landowners and facilities to adopt what are termed best management practices to prevent groundwater contamination. Furthermore, the EPA officials emphasized that it is also important to educate the local officials

responsible for enacting land-use legislation and regulations, financing local environmental programs, and enforcing these programs' requirements. Efforts to educate the general public and lawmakers would help them to more willingly support controversial land-use decisions and preventive programs, such as WHP, especially if they understand the adverse health and economic effects associated with contaminated drinking water, the EPA officials further commented.

During our review, we identified some activities EPA, states, and localities have under way to increase public awareness of the need to protect wellhead areas from various sources of contamination. For example, EPA and states have sponsored seminars and workshops to exchange and disseminate information on the benefits of protecting these areas, the options for delineating them and for compiling inventories of sources of contamination, and the best management techniques available to control or prevent groundwater contamination. EPA has also provided modest funding for conducting demonstration projects and other activities aimed at boosting public awareness, as well as for helping states develop their WHP programs. In addition, a few localities have developed public education programs to inform residents about the importance of and need for WHP programs.

Although these activities could successfully increase public awareness, they are not being performed routinely and on a large enough scale to adequately inform the general public and lawmakers about the risks associated with contaminated groundwater. In fact, several of the EPA and state officials interviewed emphasized that much more needs to be done to disseminate information about the need to protect wellhead areas. They commented, however, that their outreach efforts are limited because of resource constraints.

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**Lack of Technical Data to**  
**Implement Key**  
**Requirements of WHP**  
**Programs**

As noted earlier, reliable data on potential and actual contamination problems and sources posing threats to drinking water are essential for enacting land-use controls and convincing the general public and lawmakers about the need to protect their drinking water through preventive measures. Similarly, EPA and state officials told us that technical data are needed to properly delineate WHP areas and identify sources of contamination. In particular, EPA officials added that states need additional technical data on the characteristics and configurations of their aquifers, the direction and speed of the groundwater's flow, the reactions of chemicals and other contaminants once they get into the

groundwater, and the vulnerability of groundwater to contamination from different sources.

As we reported in December 1992, however, such data are clearly in short supply.<sup>2</sup> On the basis of a nationwide survey of state officials, we found that there were significant gaps in the data needed to identify the vulnerability of groundwater to contamination. Specifically, officials in only 15 states reported that data had been compiled in their state for all eight "vulnerability factors" necessary for conducting valid vulnerability assessments.<sup>3</sup> Even when data were available, they often covered only part of the state and were not detailed enough to use in preparing valid assessments.

During our review, several of the EPA and state officials interviewed agreed that a shortage of groundwater data exists at the state level and that this shortage complicates efforts to develop WHP programs or to implement the key program element of delineating WHP areas. In fact, while EPA has issued several guidance documents to assist states in determining the best delineation methods, the officials commented that states lack the technical and financial resources necessary to compile data bases about their aquifers, hire technical experts to perform needed tasks, and identify sources of contamination.

Without the necessary technical data or expertise to delineate wellhead areas, some states have used arbitrary fixed radii around their public drinking water wells, ranging from a few hundred to several thousand feet. However, using arbitrary distinctions can result in delineation methods' being challenged legally. For example, Florida officials told us that in 1986, a developer sued the state over the delineation method included in the state's original draft WHP program. The state proposed using a fixed radius to set its WHP areas instead of using a more technically based method that would have been based on the groundwater's flow and other characteristics of the aquifers. The developer argued that the proposed method was not scientifically and technically based and could substantially limit development in certain areas. Ultimately, in 1990, the court ruled in favor of the developer. As a result, Florida officials are in

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<sup>2</sup>See Groundwater Protection: Validity and Feasibility of EPA's Differential Protection Strategy, cited previously.

<sup>3</sup>The eight vulnerability factors concerned the depth to the groundwater, the soil's characteristics, information on the vadose zone, the depth of the confining zone, a description of the confining zone, the aquifer's thickness, the direction of the groundwater's flow, and the aquifer's boundaries.

the process of revising the delineation method and the state's draft WHP program.

EPA Region IV and Florida officials told us that revising the delineation method has, thus far, delayed getting Florida's WHP program approved by EPA. According to EPA officials in at least three other regional offices, some other state officials are concerned about the prospects of such challenges if WHP areas are not properly delineated in their state.

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## **Severe Shortage of Funding Is an Underlying Barrier**

We found that the lack of funding was the biggest obstacle hindering states' efforts to develop and implement WHP programs and hindering EPA's own efforts to assist states with their programs. This barrier also contributed significantly to the existence of the other barriers identified by EPA and state officials. Although the 1986 amendments to the Safe Drinking Water Act specified that states can obtain grants to cover costs associated with their programs, no funds have been appropriated to date under this law. In fact, EPA and states rely on the limited amounts of funds available from a patchwork of other sources to support WHP efforts.

Because of the lack of funding, EPA and state officials told us that WHP programs are generally given a lower priority at the federal and state levels than other environmental or drinking water programs mandated and funded by law. For example, though the WHP Program is one of EPA's primary programs for protecting drinking water by preventing groundwater contamination, as we reported in December 1991<sup>4</sup> EPA officials estimated that WHP activities received only about \$10 million in federal funds between fiscal years 1986 and 1991. In comparison, this amount represents less than one-half of the current estimates of the average cost to clean up only 1 of the 1,200 hazardous waste sites located across the country.

EPA Region X officials told us that while the states in that region see the value of WHP programs and are committed to them, the states have been unable to develop the programs because of resource constraints. The officials further commented that states have limited funds available to address all requirements set forth under a number of different programs, including the WHP Program, relating to groundwater in their jurisdictions. As a result, state officials often must set priorities about which programs to implement, decisions depending largely on the amount of funds and

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<sup>4</sup>See *Water Pollution: More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater*, cited previously.

sanctions associated with each program. The EPA officials also explained that WHP programs must compete with such programs as the Resource Conservation and Recovery Act program, which has appropriated funds and sanctions associated with it.

Similarly, the Chief of Iowa's Surface Water and Groundwater Bureau told us that other activities related to drinking water—such as conducting sanitary surveys and vulnerability assessments—receive a higher priority than developing a WHP program because federal funds have been appropriated for these other efforts. According to this official, because of funding constraints, the state has been unable to hire someone to develop its WHP program.

In addition to contributing to WHP programs' receiving lower priority, funding constraints have, according to state and EPA regional officials, contributed to staff turnover at the state level and states' inability to hire the technical staff needed to develop WHP programs and perform the scientific and technical analyses necessary to properly delineate WHP areas or identify sources of contamination. In terms of impacts on EPA's WHP efforts, EPA officials commented that funding constraints have limited their ability to provide technical and financial assistance to states and localities to implement key requirements of WHP programs.

EPA's and states' abilities to disseminate information about ways to implement WHP programs and better protect groundwater have also been adversely affected by funding constraints. As noted earlier, the majority of the officials interviewed believe that the public needs to be better informed about the vulnerability of groundwater and the benefits of instituting land-use and other regulatory controls. However, the officials told us that they cannot perform or fund extensive outreach efforts because they do not have the financial resources. They further added that they would like to hold more seminars, workshops, and public hearings in order to exchange or transfer information about the need to protect wellhead areas and to address any concerns local politicians or citizens may have relating to this effort. The officials believe that convincing these groups about the benefits associated with WHP is crucial and that such outreach efforts could change existing attitudes about enacting controversial land-use controls and preventive programs, such as WHP programs, and could increase the allocation of funds to such programs.

Even in Connecticut, a state with a long-term commitment to protecting its wellhead areas, an official in the state's Department of Environmental

Protection told us that the state has had to postpone its mapping activities, which are necessary to properly delineate wellhead areas, because of a lack of money. Under Connecticut's WHP program, all public water systems serving over 1,000 people are required to complete two types of mapping in order to properly delineate these areas. The first type, which is relatively inexpensive and must be completed by all public water systems, involves using computer simulations of aquifers' characteristics to determine the groundwater's flow and vulnerability. The second type, however, which is much more costly, requires public water systems to drill monitoring wells to gather more detailed and accurate data on groundwater. Because of funding constraints, Connecticut officials changed the deadlines for completing both types of mapping and the subsequent delineation of WHP areas from 1992 to 1994. However, the officials speculated that this deadline could be extended to 1996 if the water systems do not get needed funds.

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### **Limited Funds Are Available From Other Sources for WHP Programs**

Because EPA, state, and local officials have recognized the value of preventing contamination and avoiding expensive cleanup or construction costs, they have tried to tap a variety of funding sources to support their WHP programs. Nevertheless, only limited amounts of funds are available from these sources. Also, some states have tried to address the funding barrier by including some elements of WHP as part of existing groundwater programs.

The primary alternative source of funding for WHP programs arises from section 106 of the Clean Water Act. This section authorizes grants for preventing and abating surface water and groundwater pollution.<sup>5</sup> To a more limited extent, states also use funds authorized under the Clean Water Act for EPA's Nonpoint Source Program and funds authorized under the Safe Drinking Water Act for the Underground Injection Control Program. In fiscal years 1990 to 1992, EPA and states also used limited amounts of contract dollars and discretionary grant funds appropriated under both the Clean Water Act and Safe Drinking Water Act to support their WHP programs.<sup>6</sup>

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<sup>5</sup>Specifically, section 106 funds are allotted to states for, among other things, issuing permits, performing pollution control studies, planning, conducting surveillance and enforcement activities, and providing assistance and training to local governments.

<sup>6</sup>Neither EPA nor the states could tell us the total amount of contract dollars or discretionary grant funds from these sources actually spent on WHP programs because, according to the officials interviewed, WHP activities are generally performed as part of efforts undertaken for other groundwater protection programs.

According to EPA officials, a few states use money from other sources, such as the state general fund and fee systems, to fund WHP programs. For example, New Mexico officials said that for WHP activities, they use part of the \$200,000 generated each year from the state's fee system based on hazardous waste discharges. Additionally, Connecticut officials commented that they use money from the state's Emergency Spill Response Fund to support WHP efforts. Money for the fund comes from penalties levied against violators of the state's hazardous waste program, as well as from assessments imposed on facilities legally generating hazardous wastes.

Local governments have also found other funding sources. Dade County, for example, uses a variety of sources to support its WHP program. These sources include funds generated by the county's permit fee systems, Hazardous Waste Cleanup Trust Fund, and Environmental Litigation Fund. Similarly, Broward County relies on fees generated from its permit program and general fund to support its WHP efforts.

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## **Conclusions**

Over 3 years after the June 1989 statutory deadline for submitting WHP programs to EPA, only about half of the states have approved programs. Moreover, even states with approved programs have made limited progress in addressing key elements, such as defining wellhead areas and identifying sources of contamination.

The lack of meaningful progress in developing and implementing WHP programs is attributable to a number of barriers, including (1) states' reluctance to institute land-use controls at the local level, (2) a general lack of public awareness about the need to protect wellhead areas, and (3) a lack of technical data and expertise to implement crucial elements of the programs. The primary underlying problem, however, is the severe shortage of funding at the federal and state levels to support the programs.

The key to developing credible WHP programs nationwide will, therefore, depend on how well the funding problem can be addressed in an era in which many public programs are experiencing financial problems. The following chapter explores two strategies that could help to deal with this difficult problem.

# Options for Dealing With the Funding Problem Hindering Wellhead Protection Programs

To some extent, the severe funding shortage adversely affecting states' WHP programs is characteristic of similar problems facing other environmental programs, as well as an entire range of other public sector activities at all levels of government. As explained in chapter 2, EPA, state, and local officials have had limited success in addressing the WHP programs' funding problem by seeking alternative sources of funding or undertaking creative ways to generate additional resources. This chapter discusses options that states, EPA, and the Congress can use to more effectively address the severe funding problem, as well as bring WHP programs' budgetary priority more in line with the programs' purpose and benefits, namely, preventing contamination. These options include the following:

- Integrating WHP programs with states' comprehensive groundwater protection programs. Many EPA and state officials agreed that such integration would better enable them to consider the protection of wellhead areas when setting priorities across all state groundwater protection programs and when making funding decisions. This approach could also lead to more efficient use of the limited available resources and better coordination among all groundwater-related programs and activities.
- Assigning a higher funding priority to WHP programs. Certain characteristics of WHP programs, notably their preventive nature and focus on protecting drinking water, argue for a reassessment of their budgetary priority and greater funding than they have historically received.

## Integration Into States' Comprehensive Programs Could Give WHP Programs Higher Priority

In July 1991, EPA adopted a new strategy for protecting groundwater. This strategy stresses preventing contamination as the most effective way to protect drinking water and states' development of comprehensive groundwater protection programs. According to EPA, the new strategy will more comprehensively address groundwater contamination because the strategy involves identifying and addressing all potential causes of groundwater contamination within specific areas, including WHP areas. In contrast, previous efforts focused on controlling specific sources of contamination, such as hazardous waste sites and leaking underground storage tanks.

Perhaps more important, the comprehensive programs will allow states the opportunity to integrate all groundwater-related programs and activities within their jurisdictions—including WHP programs. For example, states should be better able to coordinate facility inspections required

under the Underground Storage Tank Program and the Underground Injection Control Program. Also, the comprehensive programs should help states identify groundwater that is vulnerable to contamination from hazardous waste landfills.

Unlike the requirements for WHP programs, the comprehensive programs are not mandated under any federal law. Therefore, states' participation is strictly voluntary. Nonetheless, EPA hopes states will be encouraged to develop comprehensive programs because the programs give states an opportunity to coordinate all of their groundwater-related programs, including those administered by different EPA program offices and federal agencies. The agency notes that by coordinating these programs, states should be able to identify gaps in their efforts to protect groundwater and set priorities for addressing the gaps.

In January 1993, EPA issued guidance to assist states in developing their comprehensive programs. The guidance outlined six strategic activities the programs should accomplish: (1) establishing a goal for protecting groundwater; (2) establishing priorities for meeting the goal; (3) defining the authorities, roles, responsibilities, resources, and mechanisms to address the priorities; (4) implementing all necessary efforts to accomplish the goal; (5) coordinating information to measure progress, reevaluate priorities, and support all groundwater-related programs; and (6) improving public education and participation to achieve support for the established goal, priorities, and programs.

EPA's guidance calls for a two-phased approach to establishing the comprehensive programs. The first phase, referred to as the core program, signifies each state's initial commitment to working with EPA to develop a comprehensive program. The core program will describe the individual groundwater programs operated by the state and indicate how the state plans to integrate these programs under a comprehensive approach. The second phase, referred to as the fully integrating program, represents the execution of the core program and will be achieved when all groundwater-related programs and activities are coordinated across federal, state, and local levels within a state. The proposed target date for completing the core programs is the end of 1995. EPA has not proposed a date for instituting the fully integrating programs.

Nearly all of the EPA and state officials interviewed told us that adopting the comprehensive approach for protecting groundwater could significantly enhance WHP efforts. Some of the officials agreed that

including WHP programs as part of states' comprehensive programs could increase the priority, funding, and managerial attention given to the WHP programs at the federal and state levels. Some officials also explained that this step could help WHP programs compete with other programs for the limited funds available for groundwater protection efforts.

EPA's guidance to the states indicates that an EPA-approved WHP program should be included as part of states' comprehensive programs. According to EPA headquarters officials, including WHP programs with the broader programs can be very valuable in helping states set priorities for addressing groundwater protection issues. The officials explained that, by definition, WHP areas are high-priority areas because they are the ones most vulnerable to contamination. Therefore, the officials commented, these areas should be given priority attention within the programs included in the comprehensive programs.

According to EPA's guidance, states' WHP programs could also benefit other environmental programs expected to be included in the comprehensive programs. For example, identifying potential sources of contamination, which is one of the six key elements required for WHP programs, could also help to identify Class V wells that have not been identified under the Underground Injection Control Program.<sup>1</sup> EPA also noted that states' WHP programs can provide information on the vulnerability of drinking water to contamination. States can use this information to meet the Public Water Supply Supervision (PWSS) Program's requirements for monitoring certain contaminants and conducting assessments of drinking water's vulnerability to contamination.<sup>2</sup> A groundwater official in EPA Region VIII told us that at the local level, some municipalities are using their WHP programs as enforcement tools to bring action against public water systems in noncompliance with standards that specify the maximum allowable levels for drinking water contaminants. The municipalities require noncomplying systems to (1) delineate their drinking water wells in order to identify sources causing the problem and (2) take corrective action.

EPA headquarters officials also provided documentation showing how WHP programs can also benefit other federal agencies' programs, as illustrated

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<sup>1</sup>EPA's Underground Injection Control Program establishes five classes of wells. Class V wells include those associated with activities, such as agricultural and storm drainage and the use of septic systems, that may discharge pollution directly into shallow aquifers and may cause groundwater contamination.

<sup>2</sup>The PWSS program is EPA's primary grant program designed to protect public drinking water systems from contamination.

by the following example. The Department of Agriculture plans to target for its Conservation Reserve Program farmers who have cropland that is highly erodible or that is contributing to serious water quality problems. Under this program, farmers are asked to remove land, located in designated areas, including WHP areas, from production in order to control erosion and the pollution of groundwater. In exchange, farmers will receive annual rental payments from the agency.

Thus, EPA's plan to include WHP programs as part of states' broader comprehensive programs could enhance efforts to protect wellhead areas. This course of action could also assist states and local governments to effectively implement other programs.

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## **Funding for WHP Programs Warrants Reassessment by EPA and the Congress**

While integrating WHP programs with states' comprehensive programs would be more efficient from a managerial perspective and would help address the funding shortage adversely affecting WHP programs, this integration alone is not an all-inclusive solution for these vastly underfunded programs. For one thing, some of the programs and activities expected to constitute states' comprehensive approach, such as EPA's Nonpoint Source Program and PWS Program, have been underfunded.

As we reported in June 1990, states may have to limit their activities in these areas because of scarce resources.<sup>3</sup> In addition, some EPA and state officials told us that getting money for WHP programs from other programs is very difficult because the funds are often controlled by other offices that are unwilling to part with any available funds.

Therefore, we believe that a meaningful response to the funding problem plaguing WHP programs would be for EPA and the Congress to reassess whether the budgetary priority currently given the programs is consistent with the benefits they can provide. As discussed below, we believe an examination of the WHP programs' benefits would likely lead to the conclusion that an increase in funding is justified, particularly since the programs are designed to (1) prevent contamination rather than clean it up after it occurs and (2) protect drinking water from contamination.

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<sup>3</sup>Drinking Water: Compliance Problems Undermine EPA Program as New Challenges Emerge (GAO/RCED-90-127, June 8, 1990).

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**WHP Programs Deserve  
Greater Funding Because  
They Focus on Preventing  
Contamination**

EPA has long recognized that in light of federal budget constraints, it must adopt strategies that control pollution to the greatest degree possible for the scarce dollars invested. Accordingly, regarding groundwater, EPA's stated policy over the past decade has shifted from an overwhelming emphasis on remediation to a greater investment in programs that focus on preventing contamination. In support of this shift, in July 1991 an EPA task force charged with reviewing the agency's groundwater protection program recommended that the agency strive to achieve a greater balance between these two approaches.

However, as we reported in December 1991, little progress had been made to create such a balance.<sup>4</sup> As noted earlier, WHP activities received only about \$10 million in federal funds between fiscal years 1986 and 1991. In comparison, the average cost for cleaning up 1 of the 1,200 hazardous waste sites located across the country—at about \$25 million—is 2-1/2 times more than the amount spent nationwide on WHP programs. In our report, we also observed that state and EPA regional officials complained that the policy calling for more emphasis on prevention was not accompanied by a meaningful shift in funding. Therefore, we suggested that, during the 1993 budget process, the Congress consider providing greater emphasis on preventive groundwater-related activities.

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**WHP Programs Also  
Deserve Greater Funding  
Because They Protect  
Drinking Water**

The WHP programs' focus on protecting drinking water is an additional factor that makes these programs strong candidates for greater budgetary emphasis. Because of the risks associated with groundwater contamination, the Subcommittee on Human Health of EPA's Science Advisory Board recommended in September 1990 that exposure to drinking water pollutants be treated as one of only four "high-risk" human health problems warranting top priority at EPA.<sup>5</sup>

Yet in our July 1992 report on the PWSS program, the nation's primary drinking water program, we noted that years of underfunding had left the

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<sup>4</sup>See *Water Pollution: More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater*, cited previously.

<sup>5</sup>In its report *Reducing Risk: Setting Priorities and Strategies for Environmental Protection* (SAB-EC-90-021, Sept. 1990), the Board stated, "Drinking water, as delivered at the tap, may contain agents such as lead, chloroform, and disease-causing microorganisms. Exposures to such pollutants in drinking water can cause cancer and a range of non-cancer health effects. This problem poses relatively high human health risks, because large populations are exposed directly to various agents, some of which are highly toxic."

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program in a state of disrepair.<sup>6</sup> Therefore, we suggested that the Congress, after consulting with EPA and other concerned parties, consider revising EPA's budget to provide the minimum funding levels needed to maintain the integrity of the drinking water program.

While EPA's WHP and PWSS programs are ostensibly two separate programs, their common goal of protecting drinking water suggests that the additional budgetary priority warranted to maintain the viability of the PWSS Program also apply to the WHP Program. In fact, a groundwater official in Iowa told us that WHP programs should be considered an integral part of the PWSS Program because delineating wellhead areas and compiling inventories of sources of contamination can help water systems identify (1) contaminants that they should monitor, (2) the sources of known contamination problems, and (3) the facilities that should be targeted for stringent enforcement actions.

Importantly, we are not suggesting a wholesale shift in funding from remedial programs toward WHP programs. However, we do believe that some shift in priorities could go a long way toward allowing EPA to successfully implement its groundwater protection policy and influencing states to set priorities according to relative environmental risks.

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## Conclusions

EPA's new approach of encouraging states to develop comprehensive programs could serve as a vital tool for enhancing efforts at the federal, state, and local levels to protect wellhead areas. Furthermore, integrating WHP programs into the broader comprehensive program could (1) increase the priority and attention given WHP activities; (2) better enable states to set priorities, across all of their groundwater-related programs, in order to address the most important groundwater protection issues; and (3) more comprehensively identify sources of contamination that need to be controlled more stringently by EPA or the states.

Although integrating WHP programs with the comprehensive programs would be an important step in the right direction, this step alone will not come close to eliminating the severe funding problem. For one thing, many of the other programs and activities included in the comprehensive approach, such as conducting assessments of drinking water's vulnerability, are themselves underfunded. Rather, GAO believes that a practical response to the funding problem—and one that is wholly

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<sup>6</sup>Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

consistent with EPA's policies and recent GAO reports<sup>7</sup> emphasizing preventing pollution and setting risk-based priorities—is for EPA and the Congress to consider whether the budgetary priority given the WHP Program is consistent with the program's overall purposes of (1) preventing contamination rather than cleaning it up after it occurs and (2) protecting drinking water supplies from contamination.

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## **Recommendations**

To enhance the protection of groundwater and prevent future contamination problems, we recommend that the Administrator, EPA,

- work with the states to determine the minimum funding levels needed to implement their WHP programs adequately; and
- work with the cognizant authorizing and appropriations committees of the Congress during the fiscal year 1994 budget process to identify minimum funding levels that are better aligned with the benefits of WHP programs as preventive programs designed to reduce the contamination of the nation's drinking water.

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<sup>7</sup>See Water Pollution: More Emphasis Needed on Prevention in EPA's Efforts to Protect Groundwater and Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program.



# Status of States' and Territories' Wellhead Protection Programs (as of December 1992)

State or territory	Existence of program	Date of program's approval
<b>Region I</b>		
Conn.	Yes	3/90
Maine	Yes	9/90
Mass.	Yes	5/90
N.H.	Yes	9/90
R.I.	Yes	3/90
Vt.	Yes	9/90
<b>Region II</b>		
N.J.	Yes	12/91
N.Y.	Yes	9/90
P.R.	Yes	4/91
V.I.	No	
<b>Region III</b>		
Del.	Yes	5/90
Md.	Yes	6/91
Pa.	No	
Va.	No	
W.Va.	Yes	12/92
D.C.	<sup>a</sup>	
<b>Region IV</b>		
Ala.	Yes	3/92
Fla.	No	
Ga.	Yes	9/92
Ky.	No	
Miss.	No	
N.C.	No	
S.C.	Yes	9/92
Tenn.	No	
<b>Region V</b>		
Ill.	Yes	9/91
Ind.	No	
Mich.	No	
Minn.	No	
Ohio	Yes	5/92

(continued)

**Appendix I  
Status of States' and Territories' Wellhead  
Protection Programs (as of December 1992)**

<b>State or territory</b>	<b>Existence of program</b>	<b>Date of program's approval</b>
Wis.	No	
<b>Region VI</b>		
Ark.	Yes	9/90
La.	Yes	3/90
N.Mex.	Yes	3/90
Okla.	Yes	9/90
Tex.	Yes	3/90
<b>Region VII</b>		
Iowa	No	
Kans.	No	
Mo.	No	
Nebr.	Yes	6/91
<b>Region VIII</b>		
Colo.	No	
Mont.	No	
N.Dak.	Yes	8/92
S.Dak.	Yes	9/92
Utah	Yes	9/92
Wyo.	No	
<b>Region IX</b>		
Ariz.	Yes	3/92
Calif.	No	
Hawaii	No	
Nev.	No	
American Samoa	No	
Guam	No	
N. Marianas	No	
Palau	No	
Trust Territories	No	

(continued)

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**Appendix I  
Status of States' and Territories' Wellhead  
Protection Programs (as of December 1992)**

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<b>State or territory</b>	<b>Existence of program</b>	<b>Date of program's approval</b>
<b>Region X</b>		
Alaska	No	
Idaho	No	
Oreg.	No	
Wash.	No	
<b>Total</b>	<b>27</b>	

\*According to officials at the Environmental Protection Agency's headquarters, the District of Columbia does not have to develop a wellhead protection program because the district depends totally on surface water for its drinking water.

Source: The Environmental Protection Agency's Ground Water Protection Division.

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