United States General Accounting Office

GAO

Report to Congressional Requesters

January 1993

HAZARDOUS WASTE

Much Work Remains to Accelerate Facility Cleanups

GAO/RCED-93-15

Additional material is available for GAO's report entitled Hazardous Waste: Much Work Remains to Accelerate Facility Cleanups (GAO/RCED-93-15). This additional material, entitled Compendium of 18 Corrective Action Studies, summarizes efforts to characterize and clean up contamination caused by hazardous waste at 18 businesses, such as chemical manufacturers, wood preservers, and commercial landfills. If you would like to receive a free single copy of the compendium, please return this card with your name and address.

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Resources, Community, and
Economic Development Division

B-249548

January 19, 1993

The Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives

The Honorable Al Swift
Chairman, Subcommittee on Transportation
and Hazardous Materials
Committee on Energy and Commerce
House of Representatives

As you requested, this report discusses the Environmental Protection Agency's (EPA) administration of its corrective action program to clean up hazardous waste facilities under the Resource Conservation and Recovery Act, as amended.

As arranged with your offices, 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; the Director, Office of Management and Budget; and other interested parties.

This report was prepared under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who may be reached at (202) 275-6111 if you or your staff have any questions. Other major contributors are listed in appendix III.

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

The Environmental Protection Agency (EPA) has the authority under the Resource Conservation and Recovery Act (RCRA), as amended in 1984, to require businesses with hazardous waste operations to take "corrective action" to clean up waste that has been released into the environment. An estimated 3,400 facilities out of about 4,300 in the RCRA universe are suspected of releasing waste into the environment. As of June 1992 only 43 facilities had put in place comprehensive cleanup measures.

At the request of the Chairmen of the Subcommittees on Oversight and Investigations, and Transportation and Hazardous Materials, House Committee on Energy and Commerce, GAO reviewed, among other things, (1) the status of EPA's corrective action program and implementation of measures to speed up the corrective action process and (2) the funding that has been made available for the corrective action program and the usefulness of the data used to determine oversight costs.

Background

Under the corrective action program, EPA assesses waste sites to determine if there is sufficient evidence that hazardous wastes have been released into the environment. If such evidence is found, EPA requires the owner/operators to perform studies to characterize the contamination and to undertake measures to comprehensively clean it up. If immediate actions are needed to reduce risks posed by the contamination, EPA can require that interim steps be taken, such as removing contaminated soils. EPA, or an authorized state, oversees the corrective action process. Most of EPA's corrective action budget expenditures are used for oversight activities.

EPA's 1990 RCRA Implementation Study (RIS) recommended that EPA accelerate its efforts to assess contamination at facilities. To better target resources, the RIS recommended that EPA rank all assessed facilities on the basis of potential environmental risks and benefits; stabilize the risks (halt the spread of contamination) posed by the facilities until final corrective actions (waste removal or permanent containment) can be taken; and develop a method for providing varying levels of oversight to facilities that pose different risks.

Results in Brief

EPA estimates that about 3,400 RCRA facilities are believed to have released contamination and need corrective action. EPA data show that as of June 1992 about 185 of these 3,400 facilities had begun cleanup measures to reduce threats posed by released wastes. Hoping to speed up the

process by adopting the RIS recommendations, EPA in fiscal year (FY) 1992 accelerated facility assessments and rankings—essentially meeting its goals for the year. However, some of the previous assessments were inadequate and need to be supplemented or redone. And while progress was made in rankings, at least 1,800 of the 4,300 facilities remain unranked. Furthermore, the universe of 4,300 continues to grow as EPA identifies existing facilities that are subject to its corrective action regulations.

Although EPA asked its regions for their schedules for completing facility assessments and rankings, it has not established a completion date for these actions. Instead, EPA will focus on taking actions at high-priority facilities to stabilize the further spread of contamination. EPA has estimated that stabilization will be under way at about 1,200 facilities by FY 2001. Some of the unassessed, unranked facilities, including existing facilities being added to the RCRA universe, could be environmentally threatening.

By adopting the RIS recommendation to vary levels of corrective action oversight, EPA hopes to tailor its oversight to meet the specific needs of each facility. By using fewer resources on facilities whose environmental threats are low or moderate, EPA expects to have more resources for high-priority sites. However, the effectiveness of this concept remains to be proven because the program has just started.

Although funding for corrective action has increased in recent years, EPA does not have current data on the overall cost of overseeing corrective action. As a result, EPA is unable to formulate a long-term budget strategy showing corrective action progress and costs.

Principal Findings

Slow Progress in Cleaning Up Contaminated Facilities

About 860 of the 3,400 RCRA facilities suspected of contaminating the environment have formally begun the corrective action investigation process, but only 43 of these have begun comprehensive cleanup; 142 others have taken interim steps to reduce threats posed by contamination. GAO's review of 18 facilities showed a number of reasons for the slow progress. For example, defining the nature and extent of contamination and determining appropriate action, such as installing monitoring wells to

track groundwater contamination or recovery wells to decontaminate water, can take years.

EPA Has Begun to Implement RIS Recommendations

EPA called FY 1992 a transition year, during which it planned to assess and rank facilities, thus setting its corrective action agenda for years to come. Although EPA essentially met its interim goals of assessing about 875 facilities and ranking over 2,100 facilities in FY 1992, EPA does not know with certainty how many facilities in the RCRA universe remained to be assessed and ranked at the end of FY 1992. For example, an unknown number of facilities have been given inadequate assessments that need to be supplemented with more information. Furthermore, the universe of 4,300 facilities continues to expand as new hazardous waste regulations are implemented. In addition, an estimated 1,500 to 2,000 facilities known as "converters," which had been excluded from the corrective action universe because they had ceased long-term storage of hazardous waste years ago, will now be added to the 4,300. Until all assessments and rankings are done, EPA cannot know that it is addressing the worst facilities. EPA has requested from its regions schedules for attaining the goals of complete assessment and ranking, but it has not set a target date for completing these actions. Instead, EPA plans to focus on containing releases at facilities already identified as high priority.

EPA is developing the concept of stabilization, hoping to mitigate health and environmental threats posed by facilities and halt the movement of contamination. Each year through FY 1998, EPA plans to evaluate about 500 facilities suspected of releasing hazardous waste to determine whether they are appropriate candidates for stabilization. Over the next 10 years, EPA hopes to have stabilization actions in place at about 1,200 of the 3,400 RCRA facilities that are expected to have released contamination, although EPA has told GAO that it has little information to support this estimate. Although EPA is requiring that the regions supply limited information on their stabilization efforts, it does not have an adequate method for measuring progress toward facility stabilization.

In January 1992 EPA prepared guidance for its regions on providing varying levels of facility oversight on the basis of risk and other factors. According to EPA officials, most facilities now in the pipeline are expected to receive a high level of oversight. EPA stated that this approach is not designed to reduce overall costs but to more logically allocate resources. EPA guidance suggests, but does not require, that its regions use facility oversight plans for determining the oversight and resources needed at facilities.

EPA Lacks Current Data to Determine Program's Resource Needs

Although funding for corrective action has increased in recent years, EPA does not know with certainty what it costs to oversee corrective action. It therefore cannot accurately predict the resource needs for overseeing future stabilization and final cleanup activities. EPA recognizes that its estimates for oversight costs, known as pricing factors, are obsolete but does not plan to revise them until it has more experience moving facilities toward cleanup. EPA does not have a mechanism in place to systematically gather the data needed to estimate the oversight costs but says that it will gather rough estimates of the costs by the end of FY 1993. To illustrate the importance of knowing the cost of facility oversight, if all facilities in the corrective action pipeline in FY 1992 were given the level of oversight recommended by current pricing factors, the FY 1993 budget for corrective action would need to be increased by more than 50 percent.

Recommendations

GAO recommends that the EPA Administrator require that the regions develop a plan to complete adequate facility assessments within a reasonable and specific period of time. GAO also recommends ways that the Administrator can ensure that (1) EPA has a management information system to clearly measure the effectiveness of its stabilization initiative and (2) EPA's regions use facility oversight plans or the equivalent to determine facility oversight needs and the resources required for varied oversight levels. With regard to oversight costs, GAO also recommends that the Administrator revise EPA's assumptions of the agency's and the states' costs of providing corrective action oversight at facilities. Where EPA does not have enough data to accurately estimate these costs, it needs to ensure that the data are systematically collected on a uniform basis by the regions and states. GAO makes other recommendations to improve the corrective action program, including the enhancement of resources, as discussed in chapter 5.

Agency Comments

GAO discussed the report's contents with EPA officials from the Offices of Solid Waste and Waste Programs Enforcement. These officials generally agreed with the facts presented in the report but suggested several clarifications, which GAO incorporated where appropriate. For example, EPA officials stressed the importance of the amount of corrective action work being done at the state level. As agreed, GAO did not obtain written EPA comments on the draft report.

Contents

Abbreviations

CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
EPA	Environmental Protection Agency
EPI	Environmental Priorities Initiative
FTE	full-time equivalent
FY	fiscal year
GAO	General Accounting Office
IOAA	Independent Offices Appropriation Act
MCL	maximum contaminant level
NCAPS	National Corrective Action Prioritization System
NPL	National Priorities List
OERR	Office of Emergency and Remedial Response
OMB	Office of Management and Budget
OSW	Office of Solid Waste
OSWER	Office of Solid Waste and Emergency Response
OWPE	Office of Waste Programs Enforcement
PCBs	polychlorinated biphenols
ppb	parts per billion
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RIS	RCRA Implementation Study
SWMU	solid waste management unit

Introduction

At thousands of hazardous waste treatment, storage, incinerator, and disposal facilities across the country, toxic chemicals may be seeping into the nation's groundwater and surface waters and contaminating the land and the air. This situation is the result of years of inadequate management practices at facilities such as chemical manufacturers, wood preservers, and commercial landfills. Unless corrected, toxic pollution may present a significant risk to public health and the environment. The magnitude of the environmental threat posed at these leaking hazardous waste facilities was initially recognized by the Congress when it enacted the Resource Conservation and Recovery Act of 1976 (RCRA). This act gave the Environmental Protection Agency (EPA) the authority to manage hazardous waste from its generation to its disposal and to require cleanup, known as corrective action, at a limited number of hazardous waste units. The Congress amended RCRA in 1984 to give EPA broader authority to require corrective action at all types of units.

The RCRA corrective action program is different from the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, commonly known as Superfund. RCRA authorities are typically used to address contamination at active facilities, while Superfund authorities are used at inactive sites (and also to handle emergency response actions). Under RCRA the owners/operators of facilities are expected to finance corrective action. Under Superfund public funds are expended to clean up facilities, unless financially viable parties responsible for the contamination can be found.

How Hazardous Waste Activities Are Controlled

RCRA, as amended, attempts to minimize the cleanup burden placed on the federal government by avoiding the creation of potential Superfund sites. This objective is to be achieved in two ways: (1) to correctly manage hazardous waste as it is generated, treated, stored, and disposed of so that releases to the environment are minimized and (2) to require that facility owners clean up past releases of hazardous waste and constituents while the facilities are still in existence and financially viable. RCRA, as amended, established the national policy that waste be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment. This policy allows for the possibility that released hazardous waste may not pose a present threat but that it could pose a future threat if it spreads to expose a larger area, or if land use changes to increase the potential for exposure.

EPA uses its permitting and enforcement authorities to control hazardous waste activities and require corrective action. There are four major types of hazardous waste facilities: treatment, storage,[1] incinerator, and land disposal facilities. RCRA requires any person or company owning or operating an ongoing facility to obtain an operating permit. Land disposal facilities that are closing must obtain what is known as a postclosure permit, while the other types of facilities do not need a permit to close.

The 1984 amendments to RCRA established deadlines for EPA to make final permit determinations on facilities for which permit applications had been submitted by November 1984. The last permit deadline, November 1992, applies to storage and treatment facilities. EPA is required to impose corrective action at facilities when they receive their final permits. EPA can and does, however, impose corrective action at some facilities before permit issuance through the use of corrective action enforcement orders. And for those facilities that do not need permits, EPA also uses its enforcement authority to order corrective action.

Hazardous waste facilities may contain many solid waste management units (SWMU), such as landfills, surface impoundments, waste piles, and incinerators. Before RCRA was amended in 1984, only certain land disposal units were subject to corrective action, and then only if they contaminated groundwater. These land disposal units were known as "regulated" units. Following the 1984 amendments, corrective action applies to any SWMU that has contaminated air, soil, surface water, or groundwater. EPA's permit and enforcement authority can be applied to any SWMU. EPA estimated that the amendments increased the number of SWMUs subject to corrective action 27-fold.

The RCRA Corrective Action Process

Under the RCRA corrective action program, facilities are to clean up their leaking SWMUs while EPA oversees and monitors the process. The process generally includes four stages—the RCRA Facility Assessment (RFA), the RCRA Facility Investigation (RFI), the Corrective Measures Study (CMS), and the Corrective Measures Implementation (CMI). (This is the current process; facilities that received permits soon after the 1984 amendments did not always follow this pattern.) EPA can also require facility owner/operators to take appropriate action, known as interim measures, at any time that the agency believes that expedited action should be taken to protect human health or the environment. Although RCRA established

[1]Facilities that store hazardous waste for less than 90 days are not required to obtain a RCRA operating permit.

deadlines for making permit decisions that would include language initiating corrective action, it did not set any deadlines for completing corrective action.

EPA performs the RFA to identify actual and potential releases. The RFA includes, among other things, a review of state and federal documents pertaining to the facility; an inspection of the site; and, sometimes, sampling of soil, groundwater, or surface water. The purpose of this assessment is to determine whether sufficient evidence of a release exists to require the facility owner/operator to undertake more detailed investigations.

If an RFA finds sufficient evidence of a release, or potential release of hazardous waste at a facility, EPA requires, or "imposes," an RFI. The RFI is imposed by the permit or an enforcement order.[2] The facility owner is responsible for conducting the RFI, and EPA is responsible for overseeing the work through site inspections and reviews of work plans and reports. The RFI is intended to characterize the nature, extent, and rate of migration of releases to various media, including groundwater, surface water, air, and soil. The characterization is accomplished by taking samples of the various media on and off site. The owner must propose for EPA approval a plan for carrying out the investigation and then submit periodic reports showing the data that have been collected. The RFI is complex and often takes years to complete.

Once the RFI is completed, EPA evaluates the results to determine whether corrective measures are needed. If needed, the facility owner/operator is required to complete a CMS, which proposes one or more cleanup options. For each possible cleanup method, the owner describes its advantages and disadvantages, the level of cleanliness that might be attained, and the cost. EPA selects or approves the option it believes will best address the corrective action needs of the facility. Finally, the owner/operator undertakes the CMI, or implementation of the selected remedy. During this stage EPA requires the owner/operator to design, construct, operate, maintain, and monitor the corrective measures.

[2]When a severe violation is detected, such as failure to respond appropriately to a release, or when the facility owner/operator does not respond to an informal action, the agency can take action through an enforcement order. The orders can be issued unilaterally or through a consent agreement with the owner/operator.

Federal/State Corrective Action Relationship

The RCRA corrective action program is implemented in EPA by the 10 regional offices with guidance and oversight by the Office of Solid Waste (OSW) and the Office of Waste Programs Enforcement (OWPE). OSW oversees permit decisions for hazardous waste facilities. The permits may require the facility owner to take certain corrective action steps. OWPE oversees the enforcement of the requirements of those permits, including the corrective action requirements, and the issuance of corrective action orders. The two offices prepare regulations and guidance to the EPA regions and states on the corrective action program. The Superfund program is implemented by the Office of Emergency and Remedial Response (OERR), which oversees cleanup by parties responsible for the contamination or conducts the cleanup when responsible parties cannot be found. All of these offices are organized under the Office of the Assistant Administrator for Solid Waste and Emergency Response (OSWER).

RCRA allows states to become authorized to implement the various sections of the law, including corrective action, if they can demonstrate to EPA that their program is at least as stringent as the federal program and provides for adequate enforcement. EPA distributes grant funds to the states to assist in implementing the sections of the RCRA program for which they are authorized. The states are required to supplement these grants with at least $1 for every $3 in federal money. Nearly all of the states have been authorized by EPA to issue permits and require groundwater corrective action at regulated land disposal units, but as of September 1992 only 15 states had been authorized to implement the corrective action program at all types of SWMUs, according to EPA.[3] In this report, when we describe an action taken by EPA with regard to corrective action, such an action can also be taken by states authorized to implement the program.

EPA's 1990 RCRA Implementation Study

In July 1990 EPA issued a comprehensive study of the RCRA program entitled The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study, also known as the RIS. The study was prepared by EPA and state hazardous waste program personnel with input from environmental groups, industry, congressional staff, and others. The RIS set forth EPA's philosophy for the management of hazardous waste in the coming decade and contained dozens of recommendations for improving elements of the RCRA program, including corrective action.

[3]The 15 states are California, Idaho, Colorado, Utah, Minnesota, Illinois, New York, Arkansas, Georgia, Texas, Wisconsin, North Dakota, North Carolina, Arizona, and Nevada.

Objectives, Scope, and Methodology

In response to a February 26, 1991, letter from the Chairmen of the Subcommittee on Oversight and Investigations and the Subcommittee on Transportation and Hazardous Materials, House Committee on Energy and Commerce, and subsequent meetings with their offices, we agreed to provide the following:

- The status of facilities in the corrective action process, including case study information on corrective action needs and activities at selected RCRA facilities.
- An update of EPA's efforts to speed up the corrective action process by implementing recommendations in the RIS that called for the agency to assess, rank, and stabilize facilities and to tailor facility oversight on the basis of particular characteristics.
- An evaluation of the implications of EPA's fiscal years (FY) 1992 and 1993 budget requests on the corrective action program, including an examination of the agency's cost assumptions and long-term budget strategy for the program.
- An update on EPA's actions to carry out recommendations in the RIS that called for the agency to enhance and better manage its corrective action resources.

For the first objective, we reviewed the status of the corrective action program in terms of the number of hazardous waste facilities covered by corrective action regulations and the progress being made in cleaning them up. These data were obtained from several internal EPA documents and an EPA data management system known as the RCRA Information System. We did not verify these data for accuracy.

For the second objective, we examined and reported on the conditions of a sample of RCRA hazardous waste facilities. We chose facilities identified by EPA as having caused off-site groundwater contamination in order to see what actions have been taken to address the contamination. EPA identified 129 facilities that had caused off-site contamination. Fifty-five of the facilities were in EPA Regions 4, 5, and 6 (Atlanta, Chicago, and Dallas), and we selected our case studies from those three regions because of the percentage of the total that they represented. We recognize that not all RCRA facilities have caused off-site groundwater contamination, and therefore the case studies cannot be generalized to the RCRA universe at large. However, EPA projects that up to 80 percent of facilities have released or are suspected of releasing contamination, some portion of which may cause off-site contamination.

We divided the 55 facilities into three categories on the basis of where each stood in the corrective action process. The purpose behind this was to compare facilities that were known to have caused contamination but that were at different stages of cleanup. Category 1 contained those facilities still in the RFA stage; category 2 contained those in the RFI stage; category 3 contained those that have completed the RFI stage and are in the CMS or CMI stage. We asked the three regions to provide us with a relative environmental significance ranking of the categorized facilities. Our intent was to select the two most environmentally significant facilities from each of the three categories in the three regions, yielding 18 cases in total.[4]

In two instances we did not select the highest ranking facilities for our case studies. One facility was excluded because of ongoing litigation; the other facility was being addressed solely by the Superfund program rather than the RCRA corrective action program. We therefore selected the next highest ranking facilities from the list.

Using facility files maintained by EPA or the state, we attempted to gather information on the nature and extent of contamination, the risks posed by the contamination, the regulatory actions that have been brought to bear on the facility, and the corrective actions likely to be implemented. We interviewed EPA regional officials and state officials in order to better understand the file information and to obtain their perspective on the history of each case.

To accomplish the third and fourth objectives, we interviewed numerous EPA headquarters and regional officials involved in the corrective action program to determine which of the recommendations in the RIS are being implemented. We interviewed headquarters and regional EPA officials to get updates on their progress, to learn about implementation problems, and to elicit their views on the new initiatives.

To accomplish the fifth objective, we attempted to determine whether or not corrective action funding is sufficient to address the goals set by EPA

[4]For summaries of the 18 cases, see material additional to this report entitled Compendium of 18 Corrective Action Cases, which can be ordered by returning the postcard attached in the front of this report. If the postcard is missing, send your request, with your name and address, to

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for the corrective action program. We made use of EPA budget data for FYS 1990-93, the corrective action cost assumptions that EPA uses, and data on the number of hazardous waste facilities covered by corrective action regulations. We also used data on corrective action budgeting provided to EPA headquarters by its regional offices. We discussed corrective action funding levels and the budget process with EPA's Office of Solid Waste and Emergency Response officials responsible for preparing the budget. These included the Chief of the Budget and Administrative Services Branch and the Chief of the Corrective Action Programs Branch of the Office of Solid Waste, and the Acting Director of the Program Management and Support Office of the Office of Waste Programs Enforcement.

We conducted our review between March 1991 and September 1992 in accordance with generally accepted government auditing standards. We discussed the results of our review with EPA officials from the Offices of Solid Waste and Waste Programs Enforcement, who generally agreed with the data presented. Their comments were incorporated where appropriate. As requested, however, we did not obtain written comments on this report.

Corrective Action Is a Slow Process

EPA faces a formidable task in its effort to clean up contaminated facilities. The number of facilities requiring corrective action is large, and the potential universe of facilities needing corrective action continues to expand. EPA estimates that about 3,400 of the universe of approximately 4,300 RCRA facilities may be contaminating the environment and therefore may require corrective action. Although EPA has begun the corrective action investigations at 25 percent of the 3,400 facilities suspected of leaking contaminants, the vast majority of them are still in the initial investigation phase, and only about 5 percent have moved forward with final cleanup or have taken interim measures designed to reduce threats posed by the facility.

In our review of 18 RCRA hazardous waste facilities known to have released contaminants, we found that limited progress has been made in cleaning up releases. Because many different hazardous chemicals have been released, these facilities could potentially cause serious health and environmental problems. Actions have been taken at many of the facilities to reduce the threat posed to human health and the environment, although the completion of final cleanup at all of the facilities is many years away.

EPA's ability to achieve better progress in cleaning up facilities is constrained by such factors as limited resources and the lengthy nature of the cleanup process. These and other constraints are illustrated by the 18 facilities we reviewed. EPA's responses to these constraints are discussed in more detail in chapters 3 and 5.

The Number of RCRA Facilities Potentially Subject to Corrective Action Is Large and Growing

The number of facilities in the RCRA universe is large and continually expanding. As of June 25, 1992, RCRA's universe consisted of about 4,300 facilities, most of which EPA estimates will be subject to corrective action.[1] Facilities will be added to the RCRA universe as new wastes are regulated, although EPA has limited information on the number.

New regulations are expanding the universe of facilities subject to RCRA requirements, including corrective action. EPA officials estimate, for example, that about 100 facilities may be added as a result of expanding the toxicity characteristic for hazardous waste, and that about 190 boilers and industrial furnaces that burn hazardous wastes will need to be addressed as a result of these facilities being recently brought under the control of RCRA. However, for 11 other wastes actively under evaluation by

[1]A previous GAO report entitled Hazardous Waste: Status and Resources of EPA's Corrective Action Program (GAO/RCED-90-144, Apr. 19, 1990) contains data on the split between federal and nonfederal RCRA facilities as of January 1990.

EPA as to the hazards they pose, EPA was not able to estimate the number of facilities that might be added to the universe should EPA decide that these wastes should be regulated.

Also, according to EPA officials, other facilities known as "converters" and "nonnotifiers" must be examined to see if they have corrective action needs that should be taken care of by owner/operators. Converters are facilities that have converted their storage of wastes from more than 90 days to less than 90 days. Facilities that store wastes for 90 days or less are not required to obtain a RCRA storage operating permit. Nevertheless, according to EPA, these facilities remain subject to the requirements of corrective action and, as such, must be evaluated by EPA to see if any cleanup actions may be warranted. In addition, the universe of facilities potentially subject to corrective action increases annually as EPA identifies nonnotifiers—illegally operating hazardous waste firms that have never notified EPA of their operations.

EPA officials estimate that in addition to the current universe of 4,300 facilities, there are between 1,500 to 2,000 converter facilities nationwide and that an estimated 45 to 50 nonnotifiers are identified each year. The officials emphasized, however, that because data on these facilities are limited, the estimates are not firm. As part of the fiscal year 1993 RCRA operating guidance, EPA is asking its regions for more information on the number of converters and nonnotifiers in their jurisdictions and whether assessments have been done at these facilities to determine their overall environmental threat.

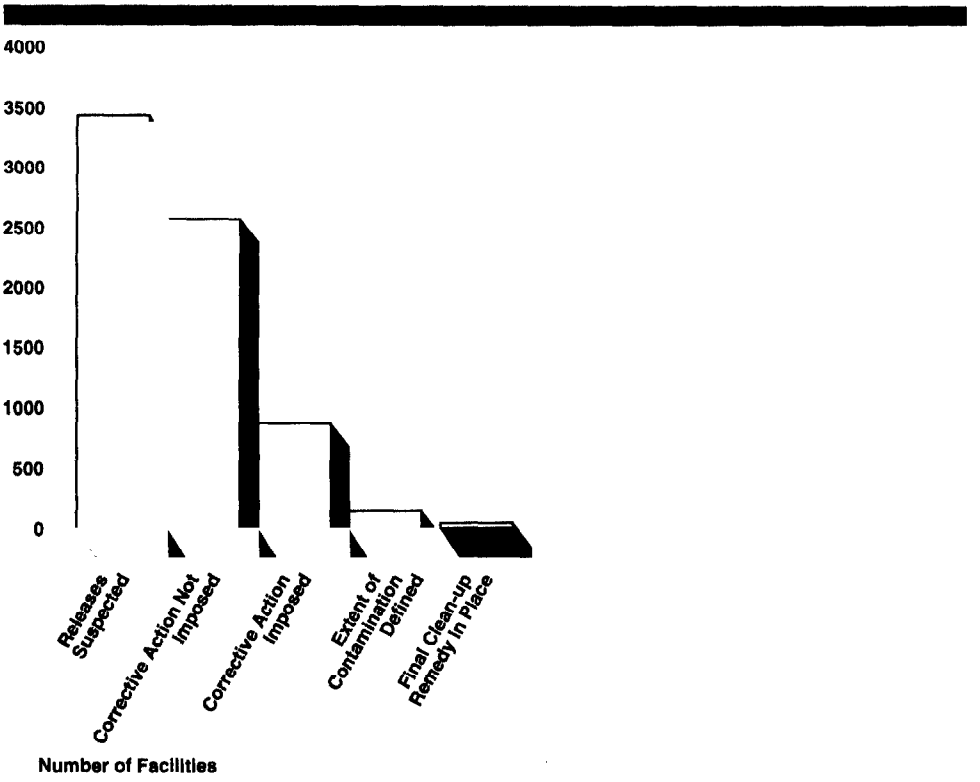
Slow Progress in Cleaning Up Facilities

On the basis of the assessment work that it has conducted over the years, EPA estimates that about 80 percent (or about 3,400) of the 4,300 RCRA facilities will be found to have evidence of releases and therefore will require further investigation to see if corrective action is warranted. EPA estimates that each RCRA facility averages about 15 to 20 solid waste management units (SWMU). Because each SWMU suspected of releasing contamination must be addressed, 51,000 to 68,000 SWMUs may need to be identified, investigated, and, if warranted, cleaned up.

As of June 25, 1992, EPA had started corrective action investigations at 861 of the 3,400 facilities (25 percent) that may ultimately require cleanup. However, the vast majority of these facilities are still in the RFI stage, which is designed to determine the extent and rate of contamination present and the environmental conditions surrounding the facility.

According to EPA data, only 140 facilities (about 4.1 percent) have completed the RFI study phase to characterize all releases at their facilities and only 43 facilities (less than 1.3 percent) have implemented final cleanup remedies as part of the CMI stage. (See fig. 2.1.)

Figure 2.1: Status of Corrective Action at Facilities With Suspected Contamination as of June 25, 1992



Does not include stabilization actions taken at 142 facilities.

Source: GAO analysis of EPA data.

Although final comprehensive remedies[2] are in place at only 43 facilities, EPA has taken actions at a number of other facilities to address obvious environmental problems. EPA has the authority to require facilities to implement interim measures at any point in the corrective action process. Interim measures, designed to reduce risks posed by a facility, can include such actions as fencing off an area to reduce the potential for exposure, providing alternative sources of drinking water, or installing a

[2]The phrase "final comprehensive remedy" means that the owner has put in place cleanup measures that address all sources of contamination rather than only isolated locations.

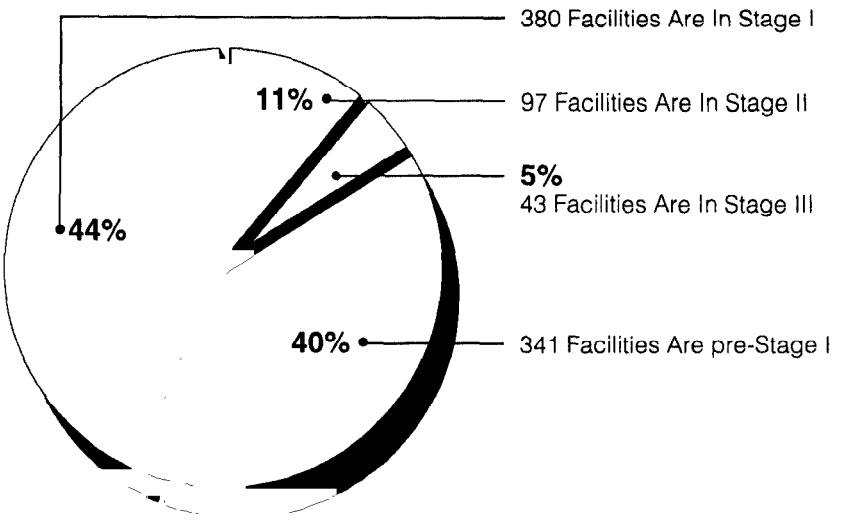
groundwater recovery system. These efforts are implemented while further study is done to select a final remedy.

EPA data show that as of June 25, 1992, interim measures had been taken at 142 facilities, although EPA officials believe that more facilities have taken interim measures than are reflected in their management information system because the regions have failed to enter the data or the actions were taken under state authorities. When these 142 facilities are added to the 43 facilities with final remedies in place, some form of corrective action has been taken at 185 facilities, or about 5.4 percent of the facilities that are expected to require cleanup.

In fiscal year 1991 EPA initiated changes in the way it managed its corrective action program. The changes were made, in part, to more effectively manage the movement of facilities into and through the corrective action pipeline. EPA's new system for measuring progress involves tracking the movement of facilities through various stages of the corrective action process.

A facility with only an RFI imposed is shown as pre-stage I. Stage I begins once the RFI work plan has been approved and ends with the approval of the RFI study report. Stage II of the process consists of the approval of the CMS work plan through the selection and approval of the corrective measures design. The final phase of the process, stage III, starts with the acceptance of the CMI work plan and moves on through the completion of final cleanup. Figure 2.2 shows the status of corrective action at the 861 facilities that were in the pipeline (meaning that an RFA had been completed and an RFI had been imposed) as of June 25, 1992. Most of the facilities are in stage I or waiting to enter stage I. One-hundred and forty (16 percent) are in stages II and III.

Figure 2.2: Status of Facilities in Corrective Action Pipeline as of June 25, 1992



Pre-Stage I consists of facilities with an RFI imposed but no approved workplan.
Stage I consists of RFI Workplan approved thru completion of RFI.
Stage II consists of CMS Workplan approved thru the approval of the Corrective Measures Design.
Stage III consists of CMI Workplan approved thru completion of CMI.

Source: GAO analysis of EPA data.

Reasons for EPA's Slow Progress

EPA's slow progress in taking corrective action at facilities has been attributed in large part to (1) limited resources and (2) the lengthy and complex nature of the process of defining the contamination and designing corrective measures. Over one-third of the universe of 4,300 RCRA facilities are land disposal facilities. In a previous report that examined the slow progress in closing a sample of land disposal facilities that did not meet new operating requirements, we noted that groundwater monitoring needed to define the contamination was often lacking.[3] This was a significant obstacle to taking the action needed to safely close and clean up those facilities. EPA has also cited the failure of more states to become authorized to administer the corrective action program as a limiting factor, one that is caused in part by the large resource burden of the program.

[3]Hazardous Waste: Impediments Delay Timely Closing and Cleanup of Facilities (GAO/RCED-92-84, Apr. 10, 1992).

In its July 1990 RCRA Implementation Study, EPA highlighted the enormous corrective action work load that it faces and the limited resources that it has available to devote to the growing problem. EPA noted that in 1985 few resources were being devoted to corrective action, whereas in 1990 its regional offices were budgeting over 30 percent of their RCRA work years to corrective action. EPA estimated that two to three times the FY 1991 level of corrective action oversight resources would be needed in future years if the universe of facilities needing cleanup was placed in the pipeline. EPA said that it was facing a critical choice: fall behind in the ability to prevent pollution through permit activities, inspections, and enforcement, or find a way to control and manage the burgeoning corrective action work load. According to EPA, the primary issue is how to manage the corrective action program so that sufficient resources are preserved to maintain an effective prevention program. Maintaining an appropriate balance between corrective action and prevention, according to EPA, is perhaps the central challenge facing the RCRA program today. (Ch. 4 examines EPA's corrective action program budgets and expenditures.)

EPA recognizes that additional funding is not the total answer to improving the corrective action process and has concluded that changes in the process are needed to make the most effective use of its limited resources. According to EPA, imposing corrective action at a large number of facilities without being able to follow through on those actions in a timely manner is not a workable policy and will ultimately undermine the agency's credibility. In an effort to improve the corrective action program, EPA has taken several actions to move facilities more expeditiously through the process. (Ch. 3 discusses these actions.)

In the RIS, EPA also acknowledged that corrective action was almost entirely a federally implemented program, despite RCRA's provision allowing state authorization. While unauthorized states are contributing resources to the corrective action work load, the RIS pointed out that many are concerned about the resource burden brought on by corrective action and are wary of undertaking corrective action at the expense of the RCRA prevention program. Some states, according to the RIS, are also concerned that they do not have the capability to carry out the program. According to the RIS, staff turnover at the state level hurts the states' ability to fulfill their RCRA mandate. As of September 1992, 15 states were authorized for corrective action. (Ch. 4 discusses EPA funding for the states' corrective action programs. Ch. 5 discusses the RIS recommendation on state authorization and EPA's efforts to implement it and other initiatives.)

Our review of 18 hazardous waste facilities helps to illustrate why the corrective action process is taking many years to unfold. Contamination was discovered at 17 of the 18 facilities 8 years or more ago. While EPA and the states have taken steps to begin corrective action at most of the facilities, often many years pass before any cleanup is begun. There are two general explanations for the length of time required to move these facilities through the corrective action process: the complexity of defining the site conditions through means such as groundwater monitoring, and what can broadly be described as personnel issues. EPA and state regulatory officials are generally not able to predict when corrective action will be completed at the facilities.

All 18 facilities have completed the RFA; on the basis of that assessment, 15 have had RFIs imposed, and the remaining 3 are expected to. Eight of the 15 facilities are in the RFI stage, while 7 have proceeded beyond the RFI to the point where final corrective measures have been considered, selected, or implemented. Some interim measures have been taken at most of them to minimize the spread of contamination.

This level of progress is not representative of all RCRA facilities. The 18 cases are meant to be illustrative of high-priority facilities only. However, approximately 40 percent of the sample of facilities examined by EPA in 1991 were in the high-priority category.

Complexity of Hazardous Waste Facilities Slows Progress

The first major factor contributing to the length of the process is that hazardous waste facilities are complex and that the science of investigation and cleanup is not precise. In over half of the 18 cases, groundwater monitoring, which is essential to characterizing the nature and extent of contamination, was for some period in the last 10 years either lacking, not done to EPA's or the state's satisfaction, or generated disputed results. For example, the state of Georgia issued a Notice of Violation to a wood-preserving facility in 1984, claiming that its groundwater-monitoring system was inadequate; Georgia then entered into a Consent Agreement that required improvements to the system. In 1987 the state ruled that the facility's permit application, which had been revised before, was not acceptable in part because it had not adequately defined the site's hydrogeology[4] or the extent of the plume of contamination.[5] The permit, including corrective action requirements, was

[4]Hydrogeology is the geology of water, with particular emphasis on the chemistry and movement of water.

[5]"Plume of contamination" refers to a visible or measurable discharge from a given point of origin.

not issued until March 1988 when the state was satisfied that the groundwater-monitoring system had adequately defined the site's characteristics and contamination.

In another instance, the owner of a chemical manufacturing facility and the state of Georgia disagreed over the meaning of the hydrogeologic data, and several years passed as they debated the issue. In 1982 the facility applied for a landfill permit from the state in order to replace existing landfills suspected of leaking hazardous wastes. In order to obtain the permit, the facility was required to demonstrate that existing contamination did not threaten a deep drinking water aquifer. The owner contended that it had so demonstrated in its permit application, but the state did not agree. The disagreement persisted until 1985, when the owner agreed to stop placing waste in the existing landfills, close them, and begin corrective action.

Perhaps related to the complexity of the circumstances at the facilities is the number of attempts required by facility owners to prepare acceptable RFI and CMS work plans and reports. According to an EPA official in the Office of Waste Programs Enforcement, there are several reasons why work plans or reports are often not approved. For example, she said that agency requirements may not be specific enough to assist the owner in preparing the document. Or they may be so specific that the owner cannot comply with every requirement. She also said that some owners may deliberately submit inadequate products in an attempt to avoid the start of cleanup. And some contractors hired by the owner may not have had the experience necessary to prepare adequate products. As part of a review of the regions' corrective action programs, EPA headquarters is trying to gather more information from the regions on the causes of inadequate submissions from the facilities.

In response to the problem of inadequate submissions, Region 5 drafted in early 1992 a consent order for one of its facilities that will limit the number of drafts of work plans and reports to two. If an acceptable product is not submitted by the second draft, the owner will be in violation of the consent order and will be penalized. This approach is patterned after Region 5's Superfund policy, and the Regional Counsel will be recommending to the Regional Administrator that it be used for all RCRA corrective action consent orders and permits.

Personnel Issues Have Slowed Corrective Action at Some Facilities

The movement of facilities through the corrective action process can depend upon the availability of contractor and agency personnel for facility investigations and oversight. We observed two cases where the facility owner changed contractors or laboratories at some point in the corrective action process. While making the change may have ultimately improved the owner's responsiveness to EPA or state requirements, the change added time as the new contractor became familiar with the facility. In one example, an Ohio waste neutralizing and recovery operation submitted draft RFI and CMS work plans in February 1989 but did not receive final approval until March 1991. The 2-year delay, according to the EPA facility manager, was caused in large part because the facility's contractor, who was discharged from the project after the initial draft work plan was submitted, kept the bulk of the work plan data. The contractor hired to succeed the original firm was required, therefore, to redevelop information in order to respond to EPA's comments on the draft work plans.

In the other case, Region 5 approved the RFI work plan of a wood-preserving facility in Illinois. The RFI work plan included a required quality assurance plan, which described the sampling and testing methodologies to be used by a laboratory chosen by the company. Region 5 policy is to approve adequate quality assurance plans and also "certify" the chosen laboratory. In this case, the laboratory was certified by the region before the quality assurance plan was approved. The facility has since submitted a CMS work plan, which also includes a quality assurance plan. Rather than rely on the certified laboratory being used for the RFI, however, the facility has selected three uncertified laboratories to do the CMS analyses. According to the EPA project manager, this will significantly slow down the CMS work plan approval and the CMS implementation while EPA certifies the laboratories.

Region 5 officials told us that it takes them an average of 14 months to approve the quality assurance plans just described. This is not solely because of the inadequacies of the plans, but also because Region 5 inspects and certifies the laboratories that have been selected by the owner to conduct the sampling analysis. Because of limited staff, the region is able to make few of these certification visits each year. In 1991 the region prepared a model quality assurance plan that it hopes will improve the plans submitted by the owners. The other regions, according to the Region 5 official, do not require that laboratories be certified before they can be contracted by the owner to analyze samples.

A Variety of Hazardous Contaminants Has Been Released at the 18 Facilities

The 18 facilities we studied have released a variety of contaminants to the environment, primarily from land-based units such as landfills, lagoons, and drainage ditches. Many of the contaminants are hazardous to human health and the environment if exposures exceed certain thresholds and durations. While contaminants have been released at all of the facilities, further study is needed at 13 of the facilities to fully characterize the nature and extent of the contamination. Cleanup objectives that were set at some of the 18 facilities indicate that contamination levels are many times higher than is acceptable.

The contaminants released from the 18 facilities include metals, such as mercury, lead, and chromium; solvents, such as toluene, trichloroethylene, and methylene chloride; and wood-preserving chemicals, including pentachlorophenol and creosote. Other contaminants include carbon tetrachloride, benzene, PCBs (polychlorinated biphenols), vinyl chloride, and polynuclear aromatic hydrocarbons. It should be noted that GAO did not discover any evidence that adverse health effects have been documented at any of these facilities. However, these chemicals, and others found at the 18 facilities, have the potential to cause a variety of harmful effects in humans and other living organisms if exposure levels reach a certain level and duration. Several are known or suspected carcinogens, and others can cause liver, kidney, or neurologic damage. (App. I identifies the primary contaminants of concern at the 18 facilities and briefly describes some of the adverse health effects that could be associated with these materials under certain conditions.)

Although contamination has been noted at all of the 18 facilities, the full extent of this contamination is still being defined at 13 because they have not completed the RFI stage. Until the RFI is satisfactorily completed, EPA is unable to fully describe or address all risks to human health or the environment. For example, one objective of the RFI is to determine whether contamination is reaching drinking water and, if so, what the levels of contamination and risk are. EPA can require interim measures at facilities before the completion of the RFI, but a comprehensive corrective measures design cannot be developed until completion. Seven of the 18 facilities have completed the RFI stage, although 2 of them will conduct more plume definition work in the CMS stage.

Corrective action requirements such as concentration limits are specified in facility permits. For cleanup of groundwater contamination from regulated units, the concentration of a hazardous constituent, depending

on what it is, must not exceed (1) the Maximum Contaminant Level[6] (MCL), if it is one of 14 specific chemicals for which MCLs have been set; (2) alternate concentration limits established by the EPA Regional Administrator, designed to protect human health and the environment; or (3) the background level.[7] For cleanup of releases from unregulated SWMUs to groundwater or anywhere else, EPA has proposed that standards be determined by health-based considerations and not background levels.

Cleanup objectives have been set at a few of the 18 facilities for specific contaminants, thereby allowing the objectives to be compared with actual concentration levels. For example, at one chemical-manufacturing plant in Alabama, carbon tetrachloride has been detected in groundwater at levels as high as 298 parts per million (ppm), nearly 60,000 times the cleanup objective of .005 ppm. At the same facility carbon disulfide has been detected at 55 ppm, over 78 times the cleanup objective of 0.7 ppm. At a wood-preserving facility in Florida, phenol has been detected at 11,000 parts per billion (ppb) compared to a cleanup objective of 2,630 ppb, and pentachlorophenol has been detected at levels up to 120 ppb, 1,200 times the cleanup objective of 0.1 ppb.

Actions Have Been Taken to Minimize Contamination, but Final Corrective Action May Be Years Away

All but two of the facilities that we reviewed had taken some action to minimize the spread of contamination. Two basic approaches can be taken, in either a limited or comprehensive manner, to reduce the extent of contamination. One is to clean up or contain waste that is in the environment. The other is to change an operating practice so that additional wastes are not released into the environment. The actions taken at the 16 facilities have generally been partial solutions. Implementation of a comprehensive cleanup program at the facilities is often several years away, and the time period for completing cleanup can rarely be predicted.

While none of the 18 facilities has completed the entire corrective action process (in fact, only 12 of the 4,300 had done so nationwide as of June 25, 1992), all but 2 have implemented some action that has either removed waste from certain units or reduced the movement of the waste. Ten facilities have installed groundwater extraction wells to remove contaminated groundwater (one other has wells in place that are not yet operational). At least six have taken or are planning closure action at land-based units by either removing waste or capping it with covers.

[6]The MCL is the maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

[7]In toxic substances monitoring, the background level is the average presence in the environment, originally referring to naturally occurring phenomena.

(Precipitation causes hazardous constituents to leach out of units; capping is intended to prevent this from happening.)

We cannot quantify the effect of the corrective measures taken at these facilities. A true measure of their effectiveness is whether or not the movement of the contamination has been halted or reversed. The project managers of 5 of the 10 facilities where groundwater is being extracted and treated to remove wastes told us that, on the basis of groundwater-monitoring well samples, they believe they have gained control over the groundwater at the site so that outward movement of the plume of contamination has been checked. It may be many years, however, before contaminant levels in the extracted groundwater fall below the cleanup standards. Although groundwater pumping may prevent the contaminants from spreading, it is a very slow process for removing the contaminants from the aquifer. According to EPA officials, it may not be practicable in some cases to actually achieve cleanup standards for the affected groundwater due to the technical complexity of restoring contaminated aquifers with current technology.

The other approach to controlling contamination—changing an operating practice so that additional wastes are not released into the environment—can take a variety of forms. At least 9 of the 18 facilities now ship the waste offsite for treatment and disposal or dispose of it in an improved on-site unit. One facility has introduced recycling systems to its process so that waste is reduced or eliminated, while two facilities incinerate their wastes. (See app. II for details on actions taken or planned by the 18 facilities to minimize the spread of contamination.)

Only five of the facilities in our sample have advanced to the point where final corrective measures have been started for the entire facility. Two project managers for other facilities estimated that complete cleanup will be under way in 2 to 3 years, while others were not able to make a prediction. Most project officials were not able to estimate when cleanup actions will result in acceptable levels of contamination.

We note that the longer it takes for facilities to complete corrective action, the greater the likelihood that the owner will go out of business or otherwise be unable to maintain the cleanup effort. We have not estimated the rate of this occurrence, although in 1990 EPA made some estimates in its analysis of the possible economic implications of what it considered the two most likely corrective action regulatory options. EPA estimated that 12 to 15 percent of RCRA facilities might be unable to cover cleanup

costs or be placed at high risk of insolvency as a result of those costs. EPA estimated that the costs left unfunded by owners due to insolvency could total between $550 million and $5.2 billion over a 50-year period. These costs could ultimately be borne by the Superfund program. EPA's 1990 estimate is being revised as part of an expanded regulatory impact analysis of the final corrective action rule.

EPA Has Begun Actions to Improve Its Corrective Action Program

Recognizing that limited progress was being made in cleaning up potentially serious hazardous waste facilities, EPA made a number of recommendations for the corrective action program in its July 1990 RIS. EPA concluded that the magnitude of cleaning up thousands of hazardous waste sites combined with the relatively fixed level of available resources meant that major changes were needed in the corrective action program if EPA were to obtain appropriate results at the worst facilities first. EPA has made limited progress, however, in carrying out its transition to this approach, which called for:

- Accelerating the assessment of facilities and ranking them according to their relative overall environmental priority.
- Taking actions at facilities to stabilize the further spread of contamination and to control or abate threats to human health and/or the environment.
- Using different levels of oversight at facilities in order to more efficiently allocate corrective action oversight resources.

The RIS also made other recommendations for the corrective action program. Among those are recommendations addressing EPA's methods for planning and budgeting and for generating additional resources for the hazardous waste program. EPA's efforts in these areas are discussed in chapters 4 and 5.

Progress Made, but Many Facilities Remain to Be Assessed

Although the assessment of facilities to determine their environmental threat has been accelerated during the last few years with the help of the Superfund program, many facilities remain to be assessed. Furthermore, as discussed earlier, some of the facilities may have received inadequate assessments that will need to be supplemented or redone, and potentially thousands of facilities added to the universe by new regulations and other actions will also require assessments. In FY 1993, however, EPA plans to focus its efforts on cleanup actions at assessed facilities while postponing the completion of assessments at the remaining facilities. The Superfund program, a major source of resources for assessments in FYs 1991-92, will provide only limited resources in FY 1993.

In the past EPA conducted RFAs at facilities to identify actual and potential releases of hazardous waste into the environment. In 1989 the RCRA program and Superfund joined together to implement the Environmental Priorities Initiative (EPI). The Superfund program agreed to provide funds to conduct 1,000 preliminary assessments per year at RCRA sites between FY 1989 and FY 1991. The Superfund program assumed management

responsibility for EPI in FY 1991. EPA developed EPI to help ensure that, with the added Superfund resources, facilities posing a serious environmental threat were identified and ranked for corrective action. Of particular concern were facilities that did not need operating permits that might be overlooked while the regions focused their efforts on facilities seeking operating permits.

According to EPA officials, OSW had expected that the EPI program would complete the assessment work load. By the end of 1989, about 600 EPI assessments had been done at RCRA facilities, and the RIS concluded that the EPI had been slow to start up and, to that point, had had a minimal impact on determining corrective action priorities.

Also according to the RIS, some regional staff said that the Superfund EPI assessments were not helpful in making corrective action decisions because they did not look at each individual SWMU, provide sufficient sampling information, or necessarily determine whether there had been a release or potential for release. Some regional staff also commented that the Superfund assessment was less relevant to RCRA.

On the basis of these findings, the RIS recommended that (1) the Superfund assessment be modified to help develop specific corrective action permit or order provisions, (2) the EPI be accelerated, and (3) Superfund continue to support the EPI effort.

Superfund Assessments Modified to Approximate RFAs

During FY 1991, following the RIS recommendation, EPA modified the Superfund assessment in an attempt to identify all SWMUs at a facility and their potential for leaking. (Regions 4 and 5 conducted these enhanced assessments before FY 1991, according to EPA.) To provide for this additional work, according to EPA staff, more time and resources have been budgeted for each assessment. Specifically, the new assessments are expected to take 200 hours of contractor time, compared to 120 hours for the old ones.

EPA's Progress in Assessing Facilities

As of June 25, 1992, 2,013 facilities had received what EPA believes is an adequate assessment; an assessment enables EPA to determine whether an RFI should be imposed. An additional 1,229 facilities had received Superfund assessments before the start of FY 1992. EPA stated that many of these assessments are not adequate but does not have an estimate of the number. Therefore, given the known universe of 4,300 facilities, anywhere

from about 1,000 to over 2,200 had not yet been adequately assessed by June 25, 1992.

The 1990 RIS recommended that the EPI be accelerated. The increased emphasis on EPI is indicated by two factors. First, the regions were required to conduct the newly expanded assessments. Second, the regions committed to conduct 874 of these assessments in FY 1992 compared to about 500 less-comprehensive assessments in FY 1991, according to EPA officials. To pay for this activity, the EPI program received over $10 million from Superfund in FY 1992 compared to about $3.3 million in FY 1991.

The facilities that were expected to be assessed in FY 1992 constitute a substantial portion of the remaining unassessed facilities, but not all of them. As of the end of November 1992, EPA officials indicated that essentially all of the 874 assessments planned for FY 1992 had been completed.

Additional Facilities Need Assessment

Although a large portion of the universe of 4,300 RCRA facilities has been assessed to some degree, additional facilities will still require assessments. These facilities include the rest of the 4,300 that are not planned for assessments in FY 1992; some portion of the 1,229 that were given Superfund assessments that are not adequate, according to EPA; an unknown number of facilities that have converted to store hazardous waste for less than 90 days (converters); newly identified but illegally operating facilities (nonnotifiers); and facilities to be brought into the universe by new regulations.

While EPA was able to essentially complete the 874 Superfund assessments that it planned for FY 1992, about 230 of the 4,300 facilities still need assessments. As discussed later, it is not clear when these 230 or so assessments are to be done.

EPA stated that because many of the 1,229 Superfund assessments performed to date inadequately assessed the potential for releases from all of the facility's SWMUs, they will need to be reassessed. EPA officials said that although the RCRA corrective action program addresses cleanup of both on-site and off-site releases, the Superfund assessments emphasized only the potential for a facility to release contaminants beyond its boundary. EPA officials told us that they expect to give the regions flexibility in choosing how to update inadequate assessments and believe that two options are likely: (1) conduct a new assessment or (2) gather and add whatever data are missing from the original assessment. A third and

less likely option, according to the EPA officials, is to move on to an RFI that would be structured to gather the data missing from the original assessment.

In addition, EPA does not appear to have a clear plan for handling the potential corrective action needs of an estimated 1,500 to 2,000 converters or an estimated 45 to 50 nonnotifiers that are identified each year. The FY 1993 RCRA implementation plan recognizes that the regions have treated these facilities inconsistently. The plan states that

> the universe of facilities requiring RFAs under the RCRA Corrective Action Program has been defined inconsistently. Some regions have included converters and non-notifiers in their universe, while others have not. Some regions included these facilities early in the history of the corrective action program, but no longer actively keep track of them. This situation has made it very difficult to determine at the national level the number of facilities in the RCRA Corrective Action universe that still need initial assessments.

According to the plan, the regions in FY 1993 are to develop strategies and time periods for completing initial RCRA assessments and are encouraged to use the same ground rules on inclusion of converters and nonnotifiers. The ground rules outlined in the plan refer to an October 1989 EPA policy whereby converters and nonnotifiers would be addressed using Superfund authority unless RCRA activity had already begun. However, the plan states that it is EPA policy to refer only high-priority converters and nonnotifiers to Superfund. The plan is silent on the disposition of medium- and low-priority converters and nonnotifiers, although an EPA official told us that assessments at those facilities will be deferred until resources are available. While the plan does not indicate how the regions are to determine these priority rankings, the EPA official said that the regions are expected to use their professional judgment. EPA has not been able to estimate the number of high-priority converters and nonnotifiers that will be referred to Superfund for assessments because they do not have enough information on the nature of these facilities. Superfund will treat these facilities as it does any others that are assessed for the National Priorities List (NPL—the Superfund cleanup list), meaning that it will conduct the normal Superfund assessment rather than the EPI version modified for RCRA purposes.

If a Superfund assessment and followup site investigation at one of these facilities results in a score above an established threshold, the facility will be placed on the NPL and undergo further Superfund remedial investigation and cleanup. If, on the other hand, the facility scores below the threshold,

it will be referred back to the RCRA program. Officials in the Corrective Action Branch of OSW expect that some facilities that do not make the National Priorities List may still warrant RCRA corrective action. Again, because of a lack of information about these facilities, the officials were not able to estimate the number or percentage that might be referred by OERR back to the RCRA program.

Those facilities that are referred back will have had a Superfund assessment that, in the past, the RCRA program has not considered adequate for its purposes because it did not examine all of the facilities' SWMUs. In order for the RCRA program to make a decision about the need for further investigation or corrective action at facilities referred by Superfund, it may be necessary to supplement the Superfund assessments.

EPA also expects several hundred facilities, such as boilers and industrial furnaces, to be brought into the RCRA universe by new regulations. These facilities, as do most RCRA facilities, pose the potential to have released hazardous waste into the environment. Each will eventually need an assessment to gauge that potential, but no clear plan exists for when such assessments will be done.

EPA Plans to Continue With Assessments but Will Focus on Cleanups

EPA has not established a deadline for completing assessments for any of the facilities. Although EPA's goal had been that all facilities would be assessed by FY 1993, according to an EPA official, that is no longer the case. EPA is moving in the direction of favoring cleanup action at more facilities and postponing the completion of assessments. The FY 1993 RCRA plan states that assessments are not a priority. As a result, assessments of the complete universe of facilities will not occur for an undetermined length of time. According to the plan, EPA regions are expected to prepare a multiyear strategy for completing initial assessments. This RCRA policy differs from Superfund, which requires that facilities be assessed within 1 year after being identified. The strategy states that completing assessments should not shift resources away from taking actual cleanup actions at high-priority facilities.

We believe that the advice from EPA headquarters to the regions—to ensure that completing assessments does not shift resources away from taking cleanup actions at high-priority facilities—reinforces the statement that assessments are a low priority. We also note that, according to EPA budget documents for FY 1993, headquarters has not budgeted any resources in the regions or states for assessments. This suggests that the

regions are expected to do assessments only if resources become available.

Superfund Will Discontinue Financial Support for EPI

Although the RIS recommended continued support of EPI, the Superfund program will provide only limited support to the RCRA facility assessment process in FY 1993. As a result, fewer resources will be available to complete assessments. A January 1992 memorandum from the Director of the OERR to the Directors of OSW and OWPE explained the change. OERR had submitted a budget request to the Office of Management and Budget (OMB) for funding assessments at approximately 500 "Phase II" EPI sites. According to the memorandum, OMB did not approve the request for any EPI funding and, in fact, reduced the entire FY 1993 Superfund budget. The memorandum stated that Superfund will not address any further EPI sites after the original universe is completed. As described above, OERR will provide assessments at an unknown number of high-priority converters and nonnotifiers in FY 1993.

Many Assessed Facilities Will Remain Unranked After FY 1992

EPA has made progress since mid-FY 1991 to rank facilities for corrective action purposes on the basis of their environmental significance. This effort follows the RIS recommendation that EPA develop and implement an overall program strategy that achieves appropriate results at facilities with the most serious problems—the "worst first" approach. However, even while EPA essentially met its goal of ranking 2,439 facilities by the end of FY 1992, a minimum of 1,840 facilities remains unranked.

The National Corrective Action Prioritization System (NCAPS), or a regional system judged by EPA headquarters to be its equivalent, is applied to each assessed facility and is designed to characterize the facility's environmental significance. NCAPS considers known or suspected releases, contaminant migration potential, exposure potential, and characteristics of the waste and of SWMUs. The procedure results in a high, medium, or low ranking for each facility.

On the basis of a 1991 analysis of 250 facilities, EPA found that approximately 40 percent were high priority, 31 percent were medium priority, and 29 percent were low priority. EPA estimated in January 1992 that about 1,700 of the 4,300 RCRA facilities will fall into the high-priority category.

According to the Chief of the Corrective Action Branch, EPA has chosen not to require the regions to rank among the high-priority facilities. Therefore, it is possible that facilities that are at the lower end of the high-priority category might be addressed for corrective action needs before facilities that are at the higher end. EPA, however, believes that the regions are aware of the worst of the facilities and are taking steps to address them. EPA also believes that not enough information is available for many of the sites to make decisions regarding their precise relative ranking.

EPA headquarters initially called for the regions to rank all facilities by April 1992. According to an EPA official, 276 facilities had been ranked by FY 1991. EPA and the regions negotiated a target of completing another 2,163 rankings by September 30, 1992, which would bring the total to 2,439. As of the end of FY 1992, a total of 2,435 facilities had been ranked. While EPA has essentially reached its target of 2,439, an additional 1,840 current facilities need to be ranked. The 1,840 facilities do not account for all of the converters or nonnotifiers that may revert back to RCRA jurisdiction, or facilities brought into the corrective action system by new regulations, all of which will also need to be adequately assessed and ranked.

Because the NCAPS rankings are linked to assessments, and because EPA headquarters has not established a schedule for completing assessments at current facilities, there is no headquarters schedule for completing the rankings. In FY 1993 EPA will not set a target for a certain number of assessments or NCAPS rankings, but it has required the regions to report in their FY 1993 Beginning-of-Year Plans their strategy and schedule for completing assessments and NCAPS rankings at facilities.

EPA's 10-Year Plan to Stabilize Contamination at RCRA Facilities

In FY 1992 EPA launched a new initiative that, over the next 10 years, calls for stabilizing contamination at about 1,200 of the more than 3,400 RCRA facilities nationwide that are expected to have releases. The initiative emphasizes taking near-term cleanup actions at facilities to control the most serious environmental problems and to prevent known releases from becoming worse. We found that EPA has very little in the way of data to support its projections of the number of facilities that it expects to clean up or the resources that will be required to implement its new initiative. As of June 1992 EPA had taken cleanup actions at only 185 facilities nationwide.

Stabilization Goal Represents a Change in Philosophy

In the 1990 RIS, EPA concluded that more emphasis needed to be given to phasing in corrective action(s) at facilities to address the most significant releases first rather than pursuing final, comprehensive remedies at fewer facilities. EPA's stabilization strategy calls for EPA to make more frequent use of interim measures as a way of achieving the goal of stabilization. According to EPA, interim measures, along with other activities, such as voluntary corrective actions by owners/operators, will be used to achieve the goal of stabilization. Stabilization at a specific facility will eventually be followed by complete corrective action.

Stabilization, according to EPA, could range from constructing a fence limiting access to a facility to installing a large-scale pumping system to extract and treat contaminated groundwater. Other stabilization actions include providing alternate drinking-water supplies, removing contaminated soils, installing runoff/run-on controls, or installing caps/covers over waste disposal areas. Some actions may be implemented very quickly, while others may require rather extensive study before being implemented.

The Stabilization Process

The first step in the process involves determining whether a facility is an appropriate candidate for stabilization measures. Among the factors to be considered are the severity of the environmental problems at the site, whether the problems will become worse if not expeditiously addressed, and the technical complexity of the site, including the feasibility of implementing a stabilization action. To assist its regions in conducting stabilization evaluations of their facilities, EPA has developed a questionnaire on these issues. For FY 1992 EPA headquarters and the regions negotiated the goal of conducting stabilization evaluations at 513 facilities. According to EPA data, the regions far exceeded their stabilization goals for the fiscal year by completing 939 stabilization questionnaires. Although the FY 1993 RCRA operating guidance does not require the regions to commit to conducting a specified number of stabilization evaluations, it makes clear that the number should equal or exceed the goal set for FY 1992.

EPA regions have been asked to use NCAPS in scheduling which facilities will receive stabilization evaluations first. According to EPA officials, the initial emphasis will be on those high-priority facilities that are in either stage I or stage II of the corrective action process.

EPA's Stabilization Projections May Be Optimistic

To implement its stabilization initiative, EPA's long-range plan for the next 7 years calls for conducting about 500 stabilization evaluations each year in order to evaluate the 3,400 facilities that are expected to require corrective action. EPA assumes that about 30 percent of the facilities evaluated (or 150 per year) will be amenable to stabilization actions and that these actions can be initiated within 2 years of evaluation. On the basis of these assumptions and the interim actions that it has taken to date, EPA estimates that it will have stabilization actions under way at about 1,200 facilities by the year 2001. The initial goal suggested in the July 1990 RIS was to implement stabilization actions at all RCRA facilities that need them within 8 to 10 years. (EPA also expects that by the year 2001 about 300 facilities will have moved into stage III of the corrective action process. This will bring the number of facilities with cleanup actions under way to about 1,500 facilities by the year 2001.)

EPA's projections for stabilization appear to be optimistic considering the progress it has made to date in cleaning up facilities. Between the enactment of the Hazardous and Solid Waste Amendments in November 1984, which established the corrective action program in its present form, and June 25, 1992, EPA took cleanup actions at only 185 facilities, or about 5.4 percent of the 3,400 facilities expected to require corrective action.

Currently, little additional information is available with which to evaluate EPA projections. For example, EPA officials told us that they did not have hard data available to support their estimate that 30 percent of the facilities that are evaluated for stabilization will be amenable to stabilization and that stabilization actions can be fully implemented within 2 years of evaluation. The estimates, according to EPA officials, were based on the judgment of headquarters and regional officials. EPA officials said that, because stabilization is essentially a new initiative, they also have not yet collected data on what resources are likely to be required to conduct stabilization evaluations and to review, approve, and oversee stabilization actions.

According to EPA officials that we spoke with, stabilization actions are likely to be more complex and require more time and resources to review than the interim measures that EPA has implemented to date. EPA officials said that they hope to acquire more information on the resource implications of the stabilization initiative during the next year and a half as EPA begins a review of the regional offices' implementation of corrective action. According to EPA, it will be in a better position to define resource

requirements and the time needed to fully implement stabilization once it has gained some experience in implementing the program. We noted that in the FY 1993 RCRA implementation plan, EPA asked its regions to report on the length of time and resources required to complete stabilization evaluations.

Adequate Data Essential to Evaluating the Effectiveness of Stabilization

EPA has established certain reporting measures for tracking the progress that its regions make in taking stabilization actions at facilities. In FY 1992, for example, EPA established requirements for the regions to report on the number of (1) RFIs imposed at high-priority facilities requiring early data collection for stabilization decisions and (2) stabilization measures initiated and completed. For FY 1993 EPA headquarters will retain essentially the same measures in addition to asking its regions to report on the types of stabilization measures implemented.

EPA's monitoring plans do not call for identifying and tracking when facilities actually become stabilized in accordance with stated objectives of the stabilization strategy, i.e., to eliminate imminent risks to human health and the environment and to prevent the further spread of contamination. This is an important benchmark, particularly considering that final remedies may not be implemented at some of these facilities for several years following the start of stabilization. Also, EPA's monitoring plans do not call for distinguishing between when a single stabilization action has been initiated at a facility and when all appropriate stabilization actions have been initiated. It is important that EPA know whether all needed stabilization actions have been taken at facilities. EPA officials explained that stabilization is a new initiative and that their monitoring of the program is still evolving.

EPA Hopes That Tiered Oversight Will Expedite Cleanups

In an effort to better focus its limited resources to help ensure that facilities move more expeditiously through the cleanup process, EPA has formally adopted a tiered oversight approach to implementing corrective action. Under the concept, oversight is to be tailored to meet the specific needs of each facility. In the 1990 RIS, EPA reported a growing acceptance of the need to vary the level of corrective action oversight at facilities to better allocate its limited resources. EPA hopes that varying the level of oversight will enable it to clean up more facilities more quickly. EPA recognizes, however, that lessening the amount of oversight at facilities involves a certain degree of risk and that some problems are likely to result, i.e., risks may go undetected or remedies may be unsuccessful.

Oversight Geared to Varying Levels of Risk

Oversight, according to EPA, can range considerably; risks to human health and the environment are the single largest factors for determining the level of oversight needed. EPA's January 1992 guidance for corrective action oversight suggests that the agency's role will be minimal for facilities needing low oversight and primarily consist of establishing performance standards and verifying that these standards have been achieved, after notice or certification by either the owner/operator or an independent engineer or geologist that the work has been satisfactorily completed. For medium levels of oversight, the role increases to include more site visits, inspections, and more stringent review and verification of owner/operator-submitted reports. Also, contractor support may be necessary. For high levels of oversight, the regulatory agency directly manages an intensive effort by thoroughly reviewing all documents and exercising a high degree of interaction with the owner/operator. In addition to performance specifications, many of the design and process aspects are also specified and reviewed by independent parties under the regulatory agency's supervision. Contractor support is often necessary.

EPA's January 1992 guidance on corrective action oversight is intended to help managers evaluate and identify the appropriate levels of oversight that should be devoted to facilities and the various oversight options that may be used. According to EPA, the level of oversight can be determined by considering various influencing factors (severity of risk to human health or the environment, facility compliance history, the level of public concern, and site complexity) and the specific corrective action activities to be conducted. EPA hopes that, by reducing the resources devoted to lower priority facilities, it will be more successful in targeting action to high-priority facilities.

EPA's guidance suggests—but does not mandate—that the regions implement the tiered oversight approach by preparing facility oversight plans. The plans, in part, are intended to assist managers in efficiently allocating resources; they can be used to help project officers determine contractor and internal resource needs and whether the oversight should be performed by EPA, the state, or a contractor. The model plan suggested in the guidance captures such information as the corrective action activities that are anticipated in the upcoming year for a given facility and outlines the specific oversight function and resources that will be needed to oversee each activity. For example, the plan may indicate that a draft RFI work plan is expected to be received during the year and that the region anticipates that it will need 15 workdays to review the work plan. By working through this process for each facility, the plan provides a

mechanism for projecting annual work load and resource requirements. EPA officials said the oversight plans were not made mandatory because regional offices were opposed to yet another mandated reporting requirement for the corrective action program and because the regions claimed to have alternative systems to accomplish the same purpose.

Concept Remains to Be Tested

According to headquarters and regional officials, it may take a couple of years before tiered oversight can be fully implemented and the benefits of the approach fully evaluated. The officials explained that the vast majority of facilities currently in the corrective action pipeline are high-priority facilities and therefore tend to need full oversight. Also, some officials stated that the initial characterization activities at a facility to determine the extent of contamination and the hydrogeology of the site may not be amenable to a lesser degree of oversight. In fact, one regional official stated that he thought it was essential that EPA have full oversight through the RFI work plan stage of the corrective action process.

EPA officials recognize that tiered oversight will be an evolving process. EPA told us that it plans through program reviews, monthly corrective action conference calls with the regions, and its annual corrective action meeting to collect information on the different oversight methods being used to find out what is or is not working and to base the need for any additional guidance on this experience.

Conclusions

At the recommendation of the RIS, the EPA corrective action program now emphasizes addressing facilities that pose the greatest environmental threat. The program is making the transition to this "worst first" approach and has made progress toward its FY 1992 goals. Beyond FY 1992, however, EPA has not yet established goals for assessing and ranking all RCRA facilities. And while EPA has long-term goals for stabilizing facilities, it does not yet have a sound basis for its projections.

Hundreds of facilities potentially remain to be assessed and ranked at the end of FY 1992, and some of the earlier assessments may not be adequate. EPA has not yet identified the facilities that have not received adequate assessments. Without adequate assessments, and the priority ranking that follows the assessment, EPA cannot be certain that it is addressing the worst facilities. EPA has explained that it has identified enough of a work load of high-priority facilities among those already assessed and ranked that it does not see the need to assess and rank all facilities before

focusing on cleanup. Under that approach, it is possible that facilities awaiting assessment may pose a greater risk than facilities being addressed in the pipeline.

EPA headquarters has asked the regions to develop a schedule for completing assessments at known facilities, but it has not established any time frames. EPA headquarters should help ensure that the regions adopt realistic schedules for completing assessments within a reasonable, specific time period and that the regions are held accountable for meeting their scheduled milestones. Also, existing facilities newly added to the RCRA universe should be assessed within a reasonable period of time, such as 1 year, as required for potential Superfund sites. Without timely assurances that all facilities are assessed and ranked, EPA cannot be assured that facilities that may pose the most serious threat are identified and cleaned up first.

Over the next 10 years, EPA's plans are to take stabilization actions at about 1,200 facilities. We found that EPA has little information to support its projections of the number of facilities that will be cleaned up under its stabilization initiative. Considering that EPA has cleanup actions under way at just 185 facilities to date, EPA's projections appear to be optimistic. The acceptance of the stabilization initiative by the Congress and the public will depend on EPA's ability to demonstrate that adequate progress is being made in eliminating imminent health threats and stopping the further migration of contaminants. In order for EPA to be able to demonstrate the effectiveness of its new stabilization approach, it is essential that it put into place reporting measures to be able to show that progress is being made in stabilizing facilities and that these actions are achieving the goal of eliminating imminent threats to human health and the environment and preventing the further spread of contamination. Currently, EPA's reporting measures do not call for tracking when facilities are considered to have been "stabilized" in accordance with the stated objective of the stabilization strategy, or for distinguishing between when a single stabilization action has been initiated at a facility as opposed to when all identified stabilization actions at a facility have been initiated.

Although EPA is hoping that by varying corrective action oversight according to the needs of each facility it will be able to better focus its limited resources and move facilities more expeditiously toward cleanup, it is too early to tell what impact a tiered oversight approach will have on expediting cleanups. Its impact is more likely to be realized in later years as EPA begins to address lower priority facilities, which will be more

amenable to a lesser degree of oversight. The facility-specific oversight plans that EPA headquarters is suggesting that its regions use could be a valuable tool for evaluating the corrective action oversight needs of individual facilities and for estimating resource needs. Also, the plans could provide some insight into the question of what is an appropriate level and cost of oversight for different facilities across regions and help EPA evaluate the consistency and impact of regional offices' implementation of tiered oversight. Therefore, as part of EPA's planned monitoring of tiered oversight, attention should be devoted to ensuring that the regions are making use of the recommended tiered oversight plans or equivalent means for evaluating the oversight needs of facilities and the resources that will be required to carry out this oversight. This kind of information should help EPA effectively manage the corrective action program and assure itself that regions are making adequate progress in cleaning up facilities.

Recommendations

We recommend that the Administrator, EPA, take the following actions:

- In order to better gauge the true universe of facilities requiring corrective action, require that the regions specifically identify all facilities, including converters and known nonnotifiers, that need but have not yet received an adequate assessment.
- Develop a plan to conduct within a specific period of time adequate assessments at all existing facilities that need them, including assessing facilities newly added to the RCRA universe within a specific period of time after becoming subject to RCRA. To avoid past problems, this plan should include minimum criteria for what constitutes adequate assessments.
- Ensure that EPA has a management information system to capture data to measure the effectiveness of the new initiative to stabilize contamination at facilities. At a minimum, EPA needs to capture data to (1) identify when facilities become "stabilized" and (2) distinguish between situations where only one or some of the identified stabilization actions have been taken at facilities, as opposed to situations where all identified stabilization actions have been taken.
- Require that the regions use facility oversight plans or equivalent methods to determine the annual corrective action oversight needs of facilities and the resources required to carry out that oversight. EPA would then be in a better position to perform a national analysis of its tiered oversight program.

EPA Lacks Current Data to Determine Program's Resource Needs

EPA's corrective action budget, for both assessments and oversight of facilities in the corrective action pipeline, nearly doubled between FY 1990 and FY 1992. A significant portion of that increase came from the Superfund appropriation, however, and is not expected to be available in FY 1993; therefore, the administration's proposed FY 1993 corrective action budget is less than the FY 1992 budget. Overall, EPA officials expect that corrective action funding is likely to remain relatively steady in the near future.

While it is clear that EPA's overall budget for corrective action has increased, the agency has not maintained comprehensive data on what the regions and states have, in turn, actually budgeted or spent on the corrective action program. Therefore, EPA does not have accurate estimates of the costs associated with conducting corrective action activities. While EPA has begun to take some action to gather data on corrective action funding in the regions and states, we do not believe that these actions will provide the mechanism needed to enable it to calculate the cost of corrective action activities. EPA evaluates the corrective action performance of the regions and states on the basis of whether or not they meet goals for the output of certain products, such as RFAs and RFI reports. While these products are important indicators of corrective action progress, we believe that EPA's lack of data on actual spending and costs hampers its ability to set goals for the program, as well as to communicate the program's funding needs.

EPA has assumptions about the resource and staffing levels needed for corrective action oversight that it agrees are out of date. If these cost estimates were assumed, for the sake of argument, to be accurate, budgeted funding would not be adequate to oversee actions taken at those facilities at the level that EPA recommends.

Funding for Corrective Action in FYs 1990-93

Funds and staff years budgeted for corrective action generally increased in FYs 1990 through 1992. In FY 1990 EPA budgeted about $34.6 million for corrective action. This amount increased to an estimated $65.6 million in FY 1992, but the administration's proposed FY 1993 budget declined to an estimated $59.9 million. This amount is subject to change when EPA's FY 1993 RCRA budget is finalized.

The corrective action program is implemented primarily by EPA regional offices and the states, with assistance from EPA headquarters staff. Funding is used for staff salaries and contractors hired to provide

additional technical support. The bulk of the corrective action work load involves conducting RFAs, imposing RFIs, reviewing and approving RFI work plans and reports, imposing interim measures, and imposing and reviewing the CMS and monitoring the CMI. EPA headquarters funding is used for staff salaries for the development of regulations and policies and for oversight of regional work. Headquarters funding is also provided for contractor support as appropriate.

Table 4.1 shows the EPA resources devoted to corrective action in FYS 1990-93 for staff and contractors. It includes funds provided by OERR from the Superfund program for facility assessments. It also shows the grant amounts allocated to the states for corrective action, including the states' required minimum match.

Table 4.1: Budget for Corrective Action Staff and Contractor Support in Headquarters, Regions, and States, FYs 1990-93

Dollars in millions

	FY 1990 (actual)	FY 1991 (actual)	FY 1992 (budgeted)	FY 1993 (proposed)
Staff budget				
EPA headquarters	$ 1.14	$ 2.03	$ 2.07	$ 2.43
EPA regions	5.43	7.42	8.25	9.16
Superfund assessment (EPI)	0	.22	.21	0
Subtotal	$ 6.57	$ 9.67	$10.53	$11.59
Contractor support budget				
EPA headquarters	$ 1.40	$ 3.55	$ 3.05	$ 3.65
EPA regions	13.13	21.49	21.79	23.21
Superfund assessment (EPI)	0	3.30	10.12	0
Subtotal[a]	$14.53	$28.34	$34.96	$26.86
State grants budget[a,b]	$13.50	$18.91	$20.11	$21.44
Total funding	**$34.60**	**$56.92**	**$65.59**	**$59.89**

[a]Before FY 1990 the totals for corrective action contractor support were: FY 1985, $.67 million; FY 1986, $6.92 million; FY 1987, $10.11 million; FY 1988, $13.05 million; and FY 1989, $12.90 million. Before FY 1990 the state grant funds budgeted by EPA to corrective action, including the assumed minimum state match, were: FY 1985, $.40 million; FY 1986, $2.67 million; FY 1987, $5.54 million; FY 1988, $8.95 million; and FY 1989, $12.48 million. Totals are not available for EPA's staff budget for those years because we could not obtain data on costs per full-time equivalent in headquarters and the regions.

[b]These figures include an assumed state match, which the states are required to provide as a condition of receiving the EPA grant. For every $0.75 granted by EPA, the state must provide at least $0.25. For example, in FY 1991 the grant funds budgeted for corrective action were $14.18 million, which could be expected to leverage an additional $4.73 million for a total of $18.91 million.

Source: EPA budget documents and officials.

Table 4.1 shows that EPA's budget for corrective action substantially increased in FY 1991. The increase is partly from OERR for the EPI program but is spread across all parts of the corrective action program—headquarters and regional staff, contractors, and the states. In FY 1992 the largest increase was budgeted by OERR for EPI, while small increases were budgeted for the regions and the states. No funds are budgeted by OERR in FY 1993 for EPI, although the administration proposed small increases for headquarters, the regions, and the states.

Work years budgeted for corrective action, also known as full-time equivalents (FTE), have also grown between FYs 1990 and 1993, with the largest increase in FY 1991. Table 4.2 shows budgeted FTE levels in headquarters and the regions for FYs 1990-93.

Table 4.2: Budgeted Corrective Action FTE Levels, FYs 1990-93

	FY 1990[a] (actual)	FY 1991 (actual)	FY 1992 (budgeted)	FY 1993 (proposed)
EPA regions	117.9	152.4	168.9	170.9
EPA headquarters	16.1	27.0	26.5	29.0
Superfund (EPI)	0	4.0	3.8	0
Total FTEs	**134.0**	**183.4**	**199.2**	**199.9**

[a]The corrective action program started in FY 1985 with relatively few staff and grew steadily over the next several years. In FY 1985 EPA devoted 15.7 FTEs nationwide to corrective action; 76.4 in FY 1986; 149.9 in FY 1987; 149.0 in FY 1988; and 137.5 in FY 1989.

Source: EPA budget documents and officials.

EPA Lacks Complete Data on Actual Corrective Action Budgeting and Spending

While EPA headquarters has budgeted a certain level of resources for corrective action to the regions and the states, it has no assurances that the regions and states in turn budget or spend that amount on corrective action. The RIS contained two recommendations on budget planning at the state and regional level. They were to (1) refine the planning/budgeting process to more accurately estimate regional and state grant resources as well as salaries and expenses for regional staff and (2) evaluate how these grant resources are spent, with headquarters developing a national report for use in making future projections and budget requests. (These recommendations pertained to the entire hazardous waste program, not just to corrective action.)

Recently gathered information on FY 1992 regional corrective action budgeting has been incomplete and will not be gathered in FY 1993. Furthermore, little information has been collected to show what the regions and states have actually spent. Instead of tracking actual expenditures for activities such as corrective action, headquarters relies on the regions' performance against output targets (such as the number of RFIs imposed or reports approved).

EPA Headquarters' Attempts to Gather Budget and Expenditure Data Have Been Incomplete

In the summer of 1991, the regions were asked to report how they planned to allocate FY 1992 resources to corrective action and prevention activities (prevention includes permitting). For an activity such as corrective action, the regions have the discretion to budget more or less than headquarters recommends. EPA requested these data as part of the regions' Beginning-of-Year Plans. (The plans, submitted for the first time in FY 1992, include information on the status and expected activity levels for all aspects of the RCRA program in each region.) Eight of the 10 regions provided data for budgeted corrective action FTE levels, and 6 provided data on budgeted contractor and state grant funding. (As an indication of regional discretion, the 8 regions that reported on staffing levels indicated that about 217 FTEs were budgeted for corrective action, while headquarters had budgeted only 168.9 for all 10 regions.)

The regions are not being asked to supply the same data for FY 1993, nor are they being asked to report how they actually spent resources in FY 1992. Headquarters officials from the State and Regional Programs Branch explained to us that some regions considered this data request to be burdensome. Instead, EPA headquarters instructions to the regions about the FY 1993 plans focus on providing specific projected output data, such as the number of facilities moving from Stage I to Stage II.

In late 1991 EPA issued a draft report on its analysis of data from the FY 1991 state work plans concerning use of the $83.15 million in total RCRA state grant funds. The purpose of the analysis was to determine the number and types of outputs committed by states in their work plans for FY 1991 and to measure the amount of resources used to provide these outputs. EPA examined the work plans with a focus on three areas: EPA grant funding to each state and the state dollar match; work years committed by the state; and outputs the state committed to in seven work plan categories, including corrective action outputs, such as RFAs conducted and RFIs imposed.

In its draft report EPA stated that a number of gaps in the data contained in the work plans made it difficult to generate a national summary. With these limited data EPA headquarters cannot compare the total of the states' budgets for corrective action with its own proposed budget, or with the amount that the regions expected the states to budget. EPA also found that the states were not consistently reporting how the grant funds were budgeted between RCRA activities, which made it difficult to calculate the total staff years budgeted to corrective action.

As an example of a data gap, 11 of the 52 state and territory work plans did not contain the amount of the grant to the states or the state match. Although the data from the 41 states showed that their matching grants averaged about 30 percent, compared to the required 25-percent match, the grant agreements often did not indicate what portion of this was specifically allocated to corrective action. EPA cannot say whether the states provided the required $4.73 million match to the $14.18 million budgeted in FY 1991 for states to use for corrective action activities.

Because the states often did not provide the dollar amounts that they budgeted for corrective action, EPA used work years as a measure of allocated resources. However, only 29 state work plans contained complete data on work years, including those budgeted for corrective action. Data from those states may indicate that they budgeted far less for corrective action than the $14.18 million that EPA headquarters budgeted. The 29 states budgeted 111.7 work years for corrective action, which represented 10.4 percent of their total budgeted work years. The remaining states either did not provide corrective action work year data or included it under another category, such as permitting, thereby making the amount impossible to identify. If one assumes however, that the 10.4 percent figure held true for all states and territories, 10.4 percent of $83.15 million provided to the states translates to $8.65 million, compared with the $14.18 million budgeted by EPA.

According to the Acting Chief of the State and Regional Programs Branch in the Office of Solid Waste, EPA is attempting to fill some of the data gaps in the work plans and is considering guidance to the regions that would call for consistent information in the work plans. These officials did not know when this decision would be made.

With regard to actual state spending, the regions conduct midyear and end-of-year reviews of the state programs that are supposed to collect data on actual expenditures. EPA headquarters does not collect these data nationwide, however. We examined 10 end-of-year state reviews from two regions and found them to be inconsistent in level of detail and types of information. One region's review provided much more information about its states' total resource budgeting and output production than the other region's. Neither region, however, prepared end-of-year reviews that indicated actual expenditures for a particular activity, such as corrective action.

Out-Of-Date Pricing Assumptions Do Not Capture True Costs of Corrective Actions

EPA does not have an accurate picture of the cost of overseeing the corrective action work conducted by facility owners and operators, despite almost 8 years of experience. While EPA headquarters has made some recent efforts to obtain better data on regional and state budgeting (described in the previous section, and below), EPA does not have the appropriate mechanism in place or under development that will enable it to gather the data necessary to make accurate revisions to its pricing factors. Pricing factors are estimates of the average resource needs (work days and/or contractor funds) to perform a particular task, such as imposing an RFI or overseeing a CMS.

The current pricing factors were based on Superfund experience, rather than on RCRA corrective action experience. In its 1989 Corrective Action Outyear Budget Strategy, EPA said that the cost of imposing an RFI at a RCRA facility may be greater than provided for in the Superfund-based pricing factors. EPA also said that the cost of subsequent oversight may be greater. The basis for these speculations was that RCRA sites, on average, have a larger number of SWMUs than Superfund sites have "operable units," a major factor affecting Superfund costs. The strategy went on to say, however, that SWMUs and operable units may not be at all comparable and therefore not necessarily an appropriate way to judge the accuracy of the Superfund-based pricing factors. EPA concluded by saying that its current pricing factors may be low and that its projections may underestimate the total cost of the corrective action program. On the other hand, the Chief of the Corrective Action Branch told us in 1991 that, in her opinion, the pricing factors may be too high. Either way, the pricing factor assumptions affect EPA's ability to calculate the program's costs.

According to agency officials, EPA does not plan to revise the pricing factors in the next several years. EPA contends that it does not have enough experience with its recently revised corrective action approach to develop accurate pricing factors. (The revised approach focuses on identifying the worst facilities and attempting to stabilize them.)

To update these out-of-date estimates, EPA needs to collect actual expenditure data from the regions and states for specific corrective action activities. As described above, EPA has not been able to collect complete regional and state spending data on its traditional approach to corrective action. In the summer of 1992, EPA headquarters began a series of corrective action program reviews at each of the 10 regions.[1] One of the

[1]According to headquarters officials, they expect to travel to each region by the end of FY 1993 to conduct the reviews. As of July 1992 EPA had completed two reviews but had not prepared a report on the findings.

issues to be covered by the reviews is the cost of corrective action oversight. To facilitate the reviews EPA developed a 25-page questionnaire for regional officials. Under the categories of stabilization and facility management/oversight, and "given GAO's recent interest in the adequacy of existing pricing factors," EPA headquarters asks for:

1. Rough estimates of the staff resources required to review a typical RFA and make a decision to impose an RFI, and the staff and contract resources required to review a typical RFI work plan and report.

2. Estimates for resources required to oversee a stabilization once it has been implemented.

We note that the questions ask only for a rough estimate and do not provide any specific guidance on collecting specific data.

Budget for Oversight of Corrective Action Pipeline Facilities Appears Inadequate, Using Current Pricing Factors

If EPA's current pricing factors were applied to the universe of facilities in the corrective action pipeline, the current corrective action budget would not be adequate to fund the level of oversight recommended by EPA. According to EPA's pricing factors, movement of a facility through the pipeline is estimated to take 21 quarters, or 5.25 years. EPA assumes that 40 work days per quarter are required for oversight, for a total of 840 work days. The cost for these work days, using FY 1992 costs, is about $186,500. EPA assumes that $295,000 in contractor costs will also be used over the 5.25 years, for a total cost of about $481,500. Therefore, on the basis of the current pricing factors, we calculate the yearly cost of corrective action oversight per site to be about $91,717 ($481,500 divided by 5.25).

According to EPA documents, at the beginning of FY 1992, 825 facilities were in the corrective action pipeline (as described in ch. 2, this number had increased to 861 by June 1992). If all of the 825 facilities are receiving oversight in accordance with the pricing factors, the total annual program cost for these activities would be about $75.67 million (825 x $91,717).

As was shown in table 4.1, the total RCRA corrective action budget for FY 1992 is about $65.6 million. Much of this corrective action budget, however, is not used to oversee facilities in the corrective action pipeline. A significant portion is used for facility assessments and rankings, which are not considered part of corrective action oversight. Also, the headquarters staff and headquarters extramural funds are used for policy development, regional oversight, and other activities that are not directly

related to oversight of specific facilities. Table 4.3 shows the regional and state budget levels strictly for facility oversight in FYs 1992 and 1993.

According to EPA's budget documents, about $38 million is budgeted in FY 1992 for oversight of facilities in the pipeline. This $38 million includes both EPA staff and contractor support and assumes that the states provide the minimum required match. Using the pricing factors for oversight of facilities in the pipeline, the program's need for oversight funding would be nearly $38 million more. While the FY 1993 proposed budget indicates a significant increase to over $53 million, it is still almost $29 million less than the pricing factors suggest is needed.

Table 4.3: EPA Budgeted Regional and State Funding for Corrective Action Oversight Activities in FYs 1992 and 1993 Compared to Estimated Needs

Dollars in millions

	FY 1992	FY 1993
Regional budget[a]	$22.55	$32.00
State budget[b]	15.26	21.44
Total	**$37.81**	**$53.44**
Estimated resource needs	**$75.67[c]**	**$81.94[d]**
Difference	**$37.86**	**$28.50**

[a]These figures include staff salaries and contractor expenses.

[b]These figures assume that the states provide the required match of $0.25 for every $0.75 granted.

[c]This figure is based on 825 facilities in the corrective action pipeline at the start of FY 1992.

[d]This figure is based on 861 facilities in the pipeline at the start of FY 1993. This is a conservative estimate considering that 861 were in the pipeline as of June 25, 1992, 3 months before the start of the fiscal year. It is also based on an EPA regional office work year cost of $53,591.

Source: EPA budget documents and officials.

This information suggests that either facilities in the pipeline are not receiving the level of oversight that the pricing factors indicate is required, or that the pricing factors do not accurately reflect the costs and the amount of time required to move a facility through the pipeline. It may be that facilities do not need an average of 40 staff days per quarter, or about $92,000 per year, in oversight.

We do not know which of these conclusions, or any other, is most likely. Either way, we believe that it is essential that EPA develop accurate pricing factors. If revised and accurate pricing factors show that the corrective action program does not have the resources necessary to oversee

facilities, that should be made clear to the Congress and the public. If EPA does not now believe that an average of 160 staff days per year is required per facility, or that it takes about 5.25 years to move facilities through the pipeline, it should attempt to demonstrate what level it believes is necessary so that future budgeting decisions can be made on a sound basis.

EPA Lacks a Long-Term Hazardous Waste Budget Strategy

In the last several years, a congressional committee has called upon EPA to develop a long-range corrective action budget strategy. The need for this was echoed in the RIS, which recommends that EPA develop a long-term strategic plan for the RCRA hazardous waste program that links environmental priorities, environmental results, and available resources and that makes clearly identifiable choices between competing priorities. The RIS also recommends that EPA improve its analyses for estimating the resource impacts of new regulations or program initiatives.

EPA has begun to develop a strategic plan for the corrective action program that attempts to focus on environmental priorities (see ch. 3). EPA does not, however, have a long-term budget strategy for the corrective action program. Nor has it estimated the resource impacts of its new regulations or program initiatives. EPA has said that it will not be able to prepare a long-term budget strategy until it has more experience with the new corrective action initiatives, and until it has promulgated final regulations for the program. EPA believes that it may be a couple of years before it is in a position to project long-range resource needs for the program.

Congressional Committee Raises Questions About EPA's Corrective Action Budget

In an April 1989 hearing, the Chairman of the House Committee on Energy and Commerce's Subcommittee on Oversight and Investigation requested that EPA prepare a corrective action budgetary strategy. In February 1991 the Chairman wrote the Administrator of EPA that since early 1989 he had urged the development of a long-term budgetary strategy/action plan for the corrective action program. The Chairman stated that it was essential as part of the RCRA reauthorization debate to develop such a long-term action plan and budgetary strategy.

The Chairman stated that the corrective action "outyear scenarios" provided to the Subcommittee in August 1989 need to be revised to correct outdated and inaccurate assumptions. The scenarios estimated the length of time required to complete corrective action, given certain assumptions

about the size of the RCRA universe and the speed with which EPA could impose RFIs.

On May 17, 1991, the Assistant Administrator for OSWER responded to the Chairman. He said that the 1990 RIS outlined a long-term strategy for managing the corrective action program and that over the past several months EPA had been working to put the components of this strategy into place. The components were (1) development of a consistent national system for setting priorities; (2) acceleration of the environmental priorities initiative; (3) development of a strategy for stabilizing RCRA facilities; and (4) differential oversight. The response also emphasized the need for EPA to strike an appropriate balance between RCRA's mandates for corrective action and other program activities.

The Assistant Administrator agreed that the outyear scenarios are no longer accurate projections, and added that

> [W]e expect, however, to reevaluate the resource needs for corrective action over the next two to three years, as we gather more definitive data on the number of facilities requiring cleanup, and the severity of their environmental problems. At that time, EPA will be better able to assess the effectiveness, and the resource implications, of the corrective action management strategy outlined above.

He also indicated that the forthcoming Regulatory Impact Analysis being done for the corrective action rule will be useful in establishing the program's resource needs. This analysis will evaluate the costs and human health and environmental benefits associated with different regulatory options for implementing the corrective action program.

The Assistant Administrator concluded by saying that EPA would provide new assumptions and updated multiyear projections after completing its effort to rank facilities and other analyses now under way. In subsequent interviews with EPA officials, we have been told that they have not made progress in estimating the resource implications of their new program initiatives because of a lack of data.

We agree that EPA needs additional data to accurately plan and project resource requirements for the program. In fact, EPA has much of the data—data that have been accumulated over its 8 years of experience.

Two levels of information need to be collected before EPA can make long-term estimates of the costs of the corrective action program. On one

level, EPA needs to know broad parameters, such as the number of facilities in the RCRA universe, the number of those that are likely to need corrective action, and the portion of those that could be considered high priority. EPA does have estimates for each of these factors, although it acknowledges that the number of RCRA facilities is changing. Another broad factor is the amount of time it typically takes to move a facility through the corrective action pipeline. EPA told us that it is attempting to pull this information from its data base.

The second level of necessary information is the cost of overseeing corrective action at individual facilities. As described above, EPA's pricing factors for the typical corrective action events (RFI, CMS, and CMI) are not current. And as described in chapter 3, EPA's new corrective action approach includes stabilization and tiered oversight, which the agency contends will affect the cost per facility. In December 1991 EPA officials estimated that about 1,200 of the approximately 3,400 facilities expected to need corrective action will be appropriate for stabilization and that stabilization actions could be started at all 1,200 facilities within 10 years. While EPA officials have told us that they do not have a solid basis for making this estimate, it is an estimate that they have some confidence in. If this estimate is soundly based, implicit in it is not only how many facilities will be appropriate for stabilization, but how many the agency believes it can afford to work on each year given a certain cost per facility. These assumptions could be used to project long-range costs of the stabilization effort.

Conclusions

EPA headquarters has budgeted increasing amounts of funding for the corrective action program in recent years. In order to assess the adequacy of the funding, it is necessary to know what is actually spent on the program, not just what is budgeted. EPA does not have national data, however, on actual regional and state expenditures for corrective action. EPA has recently attempted to gather data on how the regions and states budget their funds, but that effort yielded incomplete information, is not planned again, and did not gather data on actual expenditures.

In addition to not knowing what is spent on corrective action, EPA does not currently know with any certainty what individual corrective action oversight activities cost. EPA's best cost estimates, known as pricing factors, are out of date and were based on Superfund experience rather than RCRA experience. EPA needs to use a systematic method that will gather sound data rather than rely on estimates that might reflect different

regional perceptions and interpretations of what defines each phase of the corrective action process. If EPA does not plan for and begin to collect actual expenditure data from the regions and states for specific corrective action activities as it implements its new corrective action strategy, the lack of data will hamper its ability to (1) determine how well resources are being used at the regional and state level to oversee corrective action work, (2) set realistic targets for regional and state activities, and (3) calculate future budget needs, including the preparation of a long-term budget strategy.

Using EPA's current pricing factors reveals a large discrepancy between what is budgeted for corrective action oversight and what the pricing factors suggest is needed to actively oversee all facilities now in the corrective action pipeline. This indicates either that the program is not funded at a level adequate to provide each facility the oversight that EPA has said is needed, or that the pricing factors need to be revised to reflect actual costs. EPA does not have immediate plans to reconsider and revise the pricing factors. Until this is done, the agency cannot accurately plan program outputs, or communicate to the public and the Congress the program's funding needs and expectations.

Recommendation

To aid in more accurate budgeting for the corrective action program, and in communicating the program's needs and expectation of progress toward facility cleanup, we recommend that the Administrator, EPA, develop current and accurate assumptions for the cost of providing corrective action oversight. The cost assumptions, or pricing factors, should be based on actual expenditure data gathered on a systematic and uniform basis from the regions and states. They should be revised regularly to reflect changes in personnel costs, the types of facilities being regulated, and other variables. This effort to develop current pricing factors will be necessary for EPA to develop the long-term budget strategy called for in congressional hearings.

Enhancing Resources for the Corrective Action Program

One theme of the RIS recommendations was to enhance resources for the corrective action program. Possible means for generating additional resources included (1) using RCRA or Superfund authority to require that owners reimburse EPA for oversight expenses; (2) seeking legislative authority to collect revenues through a user fee imposed on some segment of the regulated community, or to establish a trust fund for RCRA similar to Superfund; (3) converting contractor funding to state grants or regional salaries in order to hire more staff; and (4) altering the state authorization process for corrective action to encourage more states to become authorized, thereby accessing additional state resources.

Little progress has been made in addressing these recommendations, although it should be noted that none of them can be easily implemented. One EPA region is obtaining reimbursement from a limited number of owners. Although this approach has not been adopted nationwide, EPA is considering the implications of a recent court case for its authority to obtain reimbursement. At the urging of the Office of Management and Budget, EPA has begun in 1992 to explore the possibility of imposing a user fee for hazardous waste-related services, but not necessarily for corrective action services. The proceeds obtained by the one region go to the U.S. Treasury rather than to supplement EPA's budget, as would any revenues raised by user fees. EPA is not pursuing the legislative action that would be needed to establish a RCRA trust fund. Nor has EPA made a major shift of resources from contractor support to staff salaries, although funding for contractor support has grown more slowly than funding for staff and state grants. And while more states are authorized to oversee corrective action now than when the RIS was issued, EPA has not adopted any of the new authorization process options suggested by the study, although it is exploring other options to get the states more involved in the corrective action program.

Reimbursement for Corrective Action Oversight Activity Is Very Limited

Unlike Superfund, RCRA does not contain a specific provision for owners/operators to reimburse EPA for the costs of overseeing their corrective action work. To assist EPA in undertaking more oversight, the RIS recommended that EPA recover oversight costs by using RCRA section 3013 enforcement orders for doing RFIs when the owner/operator does not provide quality RFI work.[1] It also recommended that EPA recover oversight costs by using Superfund section 104 and 106 authorities to order

[1]Section 3013 of RCRA, among other things, gives the EPA Administrator the authority to require a facility owner or operator to conduct monitoring, testing, analysis, and reporting to ascertain the nature and extent of any hazard that may be caused by the release of hazardous waste from the facility.

corrective action.[2] However, each of these options has drawbacks or limitations.

Under section 3013 of RCRA, if an owner/operator does not perform satisfactory RFI work, EPA (or a state or contractor) may carry out an RFI and seek reimbursement for its costs. Section 3013 does not, however, specifically authorize EPA to seek reimbursement for its oversight costs associated with monitoring the work of the owner/operator. In addition, section 3013 can be imposed only when human health and the environment are threatened. According to one EPA regional official, section 3013 is rarely used because it is more difficult to prove that a threat to human health exists than to prove simply that a release has occurred. Also, reimbursements obtained through section 3013 go to the Treasury or to the state or contractor that performed the work, not to EPA. Similarly, if corrective action is obtained under Superfund sections 104 and 106, recovered costs would go to the Superfund trust fund. Thus, the recovered monitoring costs would not be of direct assistance to the corrective action program.

We noted that one of the regions we visited is actively seeking reimbursement of its oversight costs from four facilities as part of the consent orders that it has negotiated to impose corrective action. In 1988 Region 6 began to include language in section 3008(h) consent orders negotiated with facility owners that required the owner to reimburse the agency for oversight expenses.[3] The region hires contractors to provide oversight for a particular facility, and the contractors track their time and expenses. EPA staff involved in oversight also track the number of hours spent and travel costs associated with oversight. The facility owner is billed for these expenses and payment is made to the U.S. Treasury. According to EPA, about $30,000 to $40,000 is collected by the Treasury each year from each of these facilities. One Region 6 official believes that the amount recovered will increase in the future as more detailed corrective action work is under way at the facilities.

As we discovered in our discussions with headquarters officials, however, Region 6 may be the only region that is routinely pursuing reimbursement

[2]Superfund section 104 provides that as a condition of carrying out remedial investigations a facility owner must agree to reimburse the Superfund for the government's costs associated with overseeing the remedial investigation work done by or for the facility owner. Under section 106, EPA can issue an administrative order unilaterally to responsible parties to compel them to clean up a site where there may be an imminent and substantial endangerment to human health or the environment.

[3]RCRA section 3008(h) consent orders are judicially enforceable agreements between the agency and the facility owner on steps to be taken by the owner to address releases of hazardous waste. The agency can also issue a section 3008(h) unilateral order if the two parties cannot reach an agreement.

for corrective action oversight. We asked headquarters officials if there is an official policy to recapture oversight costs in either consent agreements or unilateral enforcement orders. One official said that although the other regions have been told about Region 6's approach, they have not established a policy on consent agreements, in part because the reimbursement payments would not go to the RCRA program.

As a result of a recent district court case,[4] EPA may be able to rely on Superfund's cost-recovery provision to recover its costs incurred in supervising corrective action carried out under RCRA. In that case, the court ruled that EPA could recover oversight costs under Superfund section 107 for a landfill site that was cleaned up primarily under a RCRA section 3008(h) order.[5] The court stated:

> The overwhelming evidence is that Congress intended [Superfund] to be cumulative and not merely an alternative to RCRA or to be limited in its application to formally designated Superfund sites . . . . There is no statutory expression that would prevent EPA from recovering costs incurred in supervising a so-called RCRA managed site.[6]

According to EPA, under the broadest reading of this decision, it may be possible to recover oversight costs at all facilities conducting corrective action under RCRA. EPA is reviewing the decision and its potential implications for the RCRA program.

A spokesman for an industry group that represents the owners of hazardous waste facilities involved in the corrective action process told us and EPA that the members of the group would not necessarily object to paying for oversight costs if they could be assured that they would receive more timely service from EPA. In other words, in exchange for subsidizing the cost of oversight, they would like EPA to be more prompt in reviewing and commenting on corrective action products, such as RFI work plans and reports.

[4]United States v. Rohm & Haas, 790 F. Supp. 1255 (E.D. Pa. 1992).

[5]Section 107 of Superfund permits the United States to recover the costs of the actions it takes in response to releases of hazardous substances from the present and past owners and operators of a site and from the transporters and the generators of the hazardous substances.

[6]790 F. Supp. at 1262.

EPA Is Contemplating Hazardous Waste User Fee

The RIS recommended that one way to assist EPA in recovering oversight costs is to establish a RCRA trust fund or user fee system through appropriate legislative change that would ensure that the proceeds return to EPA. The RIS stated that "a RCRA trust fund or fee system, analogous to that of some states, through an amendment to RCRA would ultimately be more appropriate for full funding of oversight costs. It is important that funds from such a system go directly to EPA." Although EPA has not pursued legislative change that would establish a trust fund, it has begun to explore the possibilities of a user fee related to its hazardous waste program, but through regulatory means rather than legislative means. The proceeds would go to the U.S. Treasury and not to the agency's hazardous waste program.

Legal Authority to Levy User Fee

EPA may impose fees through regulations issued under the authority of the Independent Offices Appropriation Act of 1952 (IOAA). IOAA gives federal agencies discretionary authority to charge for a service or thing of value provided by the agency. OMB Circular A-25, which provides guidance to federal agencies on how to implement IOAA, states that user charges should be "sufficient to recover the full cost . . . of providing the service, resource, or property." IOAA authorizes federal agencies to charge for their own services but does not authorize federal agencies to require delegated states to charge for those identical services. The revenues from fees under IOAA must go to the Treasury.

Another way of providing EPA authority to impose a fee is through specific legislation. In such legislation the Congress could stipulate that the revenues from a fee be retained by EPA. The RCRA reauthorization process is one opportunity for EPA to propose that it receive legislative authority to impose a fee system that would return any proceeds to the hazardous waste program. To date, however, EPA has not advocated that the current reauthorization process address the hazardous waste program.

Past EPA Policy Regarding User Fees

EPA has no legal authority to impose a fee for an activity that a delegated state conducts, and EPA's policy has been not to impose user fees in programs where states could be granted authority to carry them out. The RCRA program, including corrective action, is delegable to the states. According to EPA's 1989 Handbook for Setting User Fees, EPA will focus on setting fees for services provided under "strictly Federal programs." The term "strictly Federal" refers to those services that are provided solely by

EPA and for which EPA does not have authority to delegate implementation to the states.

Nearly all states and territories have been granted authorization to implement corrective action at regulated SWMUs, although only 15 states have been authorized to administer corrective action at all SWMUs (which far outnumber the regulated units). The RIS recommended that all states be authorized.

FY 1993 User Fee Proposal

The administration's FY 1993 budget proposal indicates that EPA will implement in FY 1993 some type of user fee in the RCRA hazardous waste program. EPA is pursuing a number of user fees at the request of OMB. The budget document did not provide any details, such as what part of the regulated community would be covered by the fee or how much is to be raised through fee collections, although EPA officials have since told us that EPA has set a goal of raising $4 million in revenues from a user fee. An EPA official also told us that it is unlikely that a fee system will be in place in FY 1993, because as of July 1992 they did not yet have a proposal prepared to go through the process of public review and comment. Revenues collected through a fee system would not add to the resources available to the RCRA program. The user fee would be implemented under the authority of IOAA, which requires that revenues go to the general treasury rather than a specific agency.

EPA staff told us that they are in the process of developing options for a user fee. The options will consider such variables as the segment of the regulated community to be levied the fee, the activity covered by the fee, and the amount of the fee. EPA staff also told us that they initially examined options related to hazardous waste activities administered solely by EPA headquarters. A major reason behind that approach was to avoid potential problems that would be caused by imposing a fee on an activity partially administered by the states. According to EPA officials, however, these alternatives did not have the potential to generate the desired $4 million in revenue.

EPA is now exploring options related to activities administered by the regions, such as permitting, inspections, and corrective action. In July 1992 a briefing was made to the Deputy Assistant Administrator for OSWER that recommended imposing fees on two such RCRA activities (waste handling and waste export notification) and additional study of corrective action-related fees. In the briefing, EPA projected that about $2.4 million

could be collected through the waste handling and export notification fees, but probably not until January 1994.

According to a Region 6 official, corrective action provides the best opportunity for a fee system among all of the agency's hazardous waste activities. In his opinion a fee that seeks reimbursement for oversight costs might be an incentive to facility owners to submit quality work plans and reports that could be approved without considerable revision and oversight expense. However, the July 1992 briefing made the point that corrective action is very costly to industry and that high fees may affect their ability to clean up contamination.

Staff Funding Is Growing at a Faster Rate Than Contractor Funding

The RIS recommended that EPA move contract resources to salaries and expenses for more cost-effective use of those resources. Since the RIS was issued, regional staff funding and state grant funds have increased at a somewhat faster rate than contractor funding.

The former Chief of the Budget and Administrative Services Branch in OSW told us that there is an agencywide recognition that EPA relies heavily on contractors at the expense of building in-house expertise. He said that EPA finds it easier to get approval for increases in contract funding than for funding that would be used to pay agency staff salaries. While a contract work year may be more expensive than an EPA work year, the agency has more flexibility to reduce contract work years at a later date than it has to reduce agency work years. Therefore, the agency is more likely to be given appropriations to hire contractual support.

While not necessarily indicative of a trend, the requested FY 1993 corrective action budget shows an amount for salaries and expenses in the regions that is 23 percent higher than the FY 1991 actual budget (FY 1991 was the first fiscal year following the publication of the RIS). The state grants budgeted by EPA headquarters for corrective action between FYS 1991 and 1993 have increased by about 13 percent. Meanwhile, the requested budget for contractor funding for corrective action in the regions is only 8 percent higher than the FY 1991 actual budget. As described in chapter 4, however, the amount actually spent on corrective action by the regions and states is uncertain.

A Small but Increasing Number of States Are Authorized for Corrective Action

Under RCRA states may be authorized to implement a state program in lieu of the federal program. At the time the RIS was issued, 46 states were authorized to implement corrective action at regulated units,[7] but only 6 states had interim or final authorization for corrective action at all units (EPA has estimated that the total number of units is 27 times the number of regulated units). The RIS reported that EPA headquarters, the regions, and the states shared views on the principal reasons that more states have not sought authorization for corrective action. Those reasons are the authorization process itself, the lack of resources to implement the program, and the unclear standards for authorization. Headquarters staff also said that the lack of final corrective action regulations has hindered state authorization for corrective action. Few changes have been made by EPA, however, to address these three obstacles. EPA officials told us, however, of other efforts under way intended to promote authorization.

To address the authorization process, the RIS recommended that EPA examine the legal and implementation aspects of four authorization process options. The RIS also recommended that EPA establish clear standards for determining whether state programs are equivalent to the national program (a requirement for authorization) and whether the states are capable of implementing the program.

Following the RIS an EPA work group was formed to study the four process options, each of which is designed to ease authorization for, at least, parts of the RCRA program. The work group indicated in January 1991 that the ultimate goal was for all four options to coexist as a menu from which the regions could select the most appropriate approach. However, the work group also noted that the options are not as simple as they might appear and that some of them will require statutory changes. According to officials in the Office of Solid Waste's State and Regional Programs Branch, EPA has decided not to pursue any of these options until more basic issues, such as the standards for determining whether state programs are equivalent to and capable of carrying out the federal requirements, are resolved. A second work group consisting of headquarters, regional, and state staff was formed in October 1991 to explore these issues but has not yet made any recommendations on them. In January 1992, however, EPA did revise its guidance to the regions on assessing state capabilities. The memorandum introducing the new guidance notes that it may need to be revised again if the authorization process is changed.

[7]See page 11 for a brief definition of regulated units.

According to EPA officials, the most positive change affecting state authorization since the RIS was prepared is the delegation of authorization authority from headquarters to the regions. They said that this change has helped expedite the process, although it has probably not induced additional states to seek authorization. As of September 1992, 15 states were authorized for corrective action.

According to EPA officials, states are reluctant to take on the corrective action program because of the resource burden that it causes. For example, as part of its FY 1992 Beginning-of-Year Plan, Region 3 reported that Pennsylvania is "not enthusiastic about obtaining authorization for the corrective action provisions. The authorization process is too unwieldy and expensive and the result will not provide any large increase in funding." Region 5 indicated that it has reservations about the capability of the state of Indiana to be authorized for RCRA provisions, such as corrective action, because of concerns about the high turnover rate of state staff, which the region attributed in part to the low salaries offered by the state. Region 1 noted that several of its states had inadequate resources to hire sufficient personnel, or even had to furlough employees in FY 1991.

While state grant funding has increased about 13 percent, which may help the states improve their capability to implement corrective action, little financial incentive exists for them to become authorized. In FYs 1991 and 1992 each authorized state received an additional $100,000 as part of its state grant. EPA officials told us that the authorized states consider this money to be important, but the officials did not believe that the incentive was enough to induce a state to seek authorization that had not done so. Other than the $100,000 "bonus," the states do not receive additional federal funding after becoming authorized.

EPA officials emphasized to us that many states contribute to the corrective action work load even if they are not authorized. The agency has encouraged states and regions to enter work-sharing agreements. The intent is to help the states build and demonstrate their capability to handle portions of the RCRA program, including corrective action. For example, the FY 1991 Beginning-of-Year Plan from Region 5 indicates that the four unauthorized states in the region contribute 15 to 30 percent of the work load. (The two authorized states, Illinois and Minnesota, contribute 20 and 50 percent of the work load, respectively.)

Another impediment to state authorization is the absence of final corrective action regulations. EPA proposed regulations for the corrective action program in July 1990 after several years of preparation. OMB then required EPA to conduct additional analysis of the potential economic impact of the regulations before issuing final regulations. This analysis is still ongoing. EPA expects to issue the final corrective action regulations following public comment on the impact analysis. Until that time, the states cannot be certain what requirements they will be expected to meet once they become authorized. Consequently, EPA officials believe that some states have delayed seeking authorization. For example, Region 1 indicated in its Beginning-of-Year Plan that Massachusetts is waiting until the federal corrective action regulations are adopted before moving ahead toward authorization for corrective action.

EPA officials told us of efforts intended to increase authorization that did not originate from recommendations in the RIS. We did not evaluate these initiatives, which are still in the proposal stage. One is a pilot project with Region 10 and the state of Washington that would authorize the state's existing Superfund program to carry out corrective action at RCRA facilities rather than requiring the state to create a separate RCRA program. EPA believes that a number of states will be interested in pursuing authorization in this manner because it allows one cleanup program to handle both Superfund and RCRA facilities in the state.

Another initiative, according to EPA, concerns interim authorization. Under current regulations, states can be authorized for corrective action on an interim basis, which EPA says can accelerate and simplify the process. The regulatory authority for interim state authorization will expire in 1993, but EPA is developing a proposal to extend the authority for 10 years.

Conclusions

EPA has not adopted any of the RIS recommendations designed to access additional resources from the regulated community. Although one region (Region 6) has entered into consent agreements with facility owners for the reimbursement of oversight costs borne by EPA, this approach has not been attempted elsewhere, nor has EPA required other regions to do so. EPA has authority under Superfund to recover its oversight expenses but has not fully determined the extent of its authority under RCRA to recover oversight costs through, for example, unilateral enforcement orders or permits. Until this authority is defined or, if necessary, created, EPA will not be able to recover its corrective action oversight expenses in a comprehensive manner.

Although EPA has not requested the legislative change required to establish a corrective action trust fund comparable to Superfund, it has begun to explore the possibility of imposing a user fee on some segment of the hazardous waste community, including, perhaps, those affected by corrective action. However, a fee will not be helpful to the agency unless it can control the revenues. EPA is finding that the number of fee options is limited. One major reason for the limits is that RCRA responsibilities are delegated, or delegable, to the states. EPA cannot impose a fee for an activity carried out by a delegated state, and its policy has been not to impose fees in programs that could be delegated to a state.

While the RIS made a number of recommendations about authorizing states for corrective action, in an effort to fully leverage state and agency resources, EPA has not yet removed the major impediments—the complicated process, inadequate resources, and the lack of final corrective action regulations—that discourage states from seeking authorization. Changes in the process have been considered but will not be made in the immediate future. Corrective action budgets for the states have increased somewhat, but states have no real financial incentive to seek authorization. In addition, final corrective action regulations are not expected to be issued for another year.

Recommendations

We recommend that the Administrator, EPA, (1) determine under what circumstances the agency has the legal authority to require the owners of hazardous waste facilities to reimburse either the federal government or EPA for costs associated with overseeing corrective action and (2) begin using such authority. If EPA determines that it does not have the authority to require reimbursement, we recommend that the agency seek the authority, using as justification the concept underlying the Superfund program—that those responsible for hazardous waste contamination be responsible for both cleanup and oversight costs. Until broader authority is obtained, we recommend that EPA establish the policy that the regions attempt, where possible, to enter into agreements with facility owners and operators whereby the federal government is reimbursed for costs associated with oversight of corrective action. The Region 6 approach could be used as a national model.

Primary Hazardous Contaminants at the 18 Facilities

Presented below are potential effects associated with exposure to selected chemicals detected at the 18 facilities. Several sources were used to identify potential health effects. One source, the Environmental Protection Agency's (EPA) Hazardous Substance Fact Sheets, emphasizes several points. First, determining the health effects of chemicals is a very complex process. EPA points out that there might be subtle but important differences in the way government agencies and scientific institutions might state their conclusions regarding health effects of particular chemicals according to potential exposures. The EPA fact sheets focus on health effects associated with occupational exposure rather than community exposure, which is likely to be smaller and different. Finally, EPA notes that most chemicals have not been tested for toxicity in a comprehensive manner and that there are scientific gaps in our knowledge.

Contaminants	Potential effects[a]
Carbon Tetrachloride	Probable carcinogen; may cause liver and kidney damage
Pentachlorophenol	May cause lung, liver, and kidney damage
Coal Tar Creosote	Probable carcinogen
Arsenic	Known carcinogen; may cause liver and kidney damage
1,1-dichloroethylene	Liver and kidney damage in experimental animals; skin irritant
Chloroform	Probable carcinogen; may cause liver and kidney damage
Lead	Damages the central nervous, urinary, and reproductive systems and the blood-forming organs
Mercury	Kidney damage, neurologic effects
Benzene	Carcinogen, may cause liver, kidney, and brain damage
Zinc	May cause chills, fever, nausea, and vomiting
Phenol	Possible carcinogen; may cause liver and kidney damage
PCBs (Polychlorinated biphenols)	Probable carcinogen; may damage reproductive system
Trichloroethane	May cause liver and kidney damage
Nickel	Probable carcinogen; reported to have caused cancer of lungs and sinuses
Ethylene Dibromide	Probable carcinogen; may cause liver, lung, kidney, and reproductive system damage
Methylene Chloride	Suspected carcinogen

(continued)

Contaminants	Potential effects[a]
Carbon Disulfide	May cause damage to nervous system and muscle weakness; high blood pressure, kidney, and liver damage may occur
Chlorobenzene	May cause kidney, liver, or lung damage
Xylene	Irritation of eyes, nose, throat; may cause reversible liver and kidney damage
Toluene	May cause irritation of eyes, respiratory tract, and skin; may cause liver and kidney damage
Ethylbenzene	Irritating to eyes, skin, and mucous membranes
Trichloroethylene	Possible carcinogen; may cause liver and kidney damage
Chromium	Known carcinogen; irritating to skin and respiratory system
Cadmium	Probable carcinogen; may cause reproductive damage

[a]Not all potential health effects are listed for each contaminant. Generally, the more significant health effects are listed. Also, the potential effects are generally based on prolonged or repeated exposure.

Sources: The Merck Index, Eleventh Edition, 1989; Chemical Safety Data Guide, The Bureau of National Affairs, Inc., 1985; Hazardous Substance Fact Sheets, U.S. Environmental Protection Agency, Office of Toxic Substances.

Actions Taken or Planned to Minimize the Spread of Contamination at the 18 Facilities

Company	Type of action taken or planned
Region 4	
A	Extract and treat groundwater; drain and fill ponds and lagoons with clean soil; dispose of waste off site or in lined facilities
B	Install groundwater extraction wells; drain and close surface impoundment; installed closed-loop system for wood-preserving materials
C	Collect and treat surface water; unapproved closure of two lagoons; storage facility to be closed
D	Close all surface impoundments and landfills and install groundwater recovery systems; improvements made to minimize spills
E	Pump and treat groundwater; remove soil; and pave areas to control runoff; spent acids and wastewater now treated before disposal
F	Extract groundwater; drain holding ponds; and cap landfills
Region 5	
G	Extract groundwater; cap soils with asphalt; no longer dispose of waste in dry well; waste incinerated on site
H	At own initiative, the owner/operator has undertaken measures, such as controlling site runoff and excavating portions of the nearby creek; facility is in the process of closing
I	No evidence of corrective measures, but hazardous wastes now sent off site for recycling
J	Installed leachate collection system, pumped liquids from a landfill for treatment; nonhazardous liquids from treatment process are injected into deep wells; hazardous waste shipped off site for disposal; previously, sludges were land disposed
K	No evidence of corrective measures, but hazardous wastes are stored in containers and tanks for off-site treatment and disposal; lagoons no longer being used
L	Landfill units closed
Region 6	
M	Extracting groundwater from contaminated zones; surface impoundments closed; facility stores and treats wastes as well as injects waste in a deep well
N	Cap surface impoundment and landfill units; install pump-and-treat system, but the system is not yet capable of treating the water; hazardous waste either treated and disposed of in underground injection wells or sent off site for disposal; land units capped
O	Initiate groundwater recovery and treatment program; no longer disposing of waste in unlined surface impoundments; wastes shipped off site for disposal
P	Install groundwater interceptor systems; no longer using unlined surface impoundments; uses container storage area and a permitted secure landfill for disposal
Q	Extract and treat contaminated groundwater; facility is closing
R	Two surface impoundments undergoing closure; uses tanks and containers for storage and an incinerator for disposal

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