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GAO

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

May 1991

HAZARDOUS WASTE

Limited Progress in Closing and Cleaning Up Contaminated Facilities

GAO/RCED-91-79

GAO

United States
General Accounting Office
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Resources, Community, and
Economic Development Division

B-243509

May 13, 1991

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

Dear Mr. Chairman:

As you requested, this report describes the Environmental Protection Agency's (EPA) progress in completing closures and issuing post-closure permits at hazardous waste land disposal facilities that are shutting down their waste operations. Also, the report evaluates EPA's program for setting priorities for the cleanup of hazardous waste facilities posing the most significant environmental threat.

As arranged with your office, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to other appropriate congressional committees; the Administrator, EPA; 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 II.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Nearly half of the 4,615 facilities nationwide that treat, store, or dispose of hazardous waste decided during the 1980s to close their operations because they were unable or unwilling to meet federal hazardous waste requirements. These requirements specify how hazardous waste facilities should be managed to ensure that their wastes do not harm human health and the environment. Under the Resource Conservation and Recovery Act (RCRA), the Environmental Protection Agency (EPA) and the states must oversee the operations of hazardous waste facilities and ensure that facilities ceasing operations close in a timely and safe manner.

The Chairman of the Environment, Energy, and Natural Resources Subcommittee of the House Committee on Government Operations asked GAO to determine, among other things, EPA's (1) progress in completing closures of hazardous waste facilities and issuing post-closure permits and (2) efforts to set priorities for the cleanup of hazardous waste facilities posing the most significant environmental threat. The Chairman asked GAO to focus its review on land disposal facilities that are closing because they pose the greatest environmental threat.

Background

Hazardous wastes are handled in three principal ways—land disposal, incineration, and treatment and storage in tanks and containers. Because land disposal facilities generally leave waste in the ground when they close, RCRA regulations require their owner/operators to implement two important activities at those closing hazardous waste operations (units) that were active when RCRA regulations became effective in November 1980. First, owner/operators must properly close their waste management units by installing protective covers over them to control or minimize the escape of existing waste. Second, they must obtain post-closure permits, which require groundwater monitoring to determine whether there has been any contamination and if so to clean it up. Units that were inactive as of November 1980 were not required to meet these requirements. However, in 1984, the Congress amended RCRA, requiring units that were inactive as of November 1980 to also be cleaned up. As of February 1991, 1,128 hazardous waste land disposal facilities were scheduled to close.

Results in Brief

EPA has made only limited progress in closing and issuing post-closure permits to land disposal facilities. As of February 1991, only 337, or about 30 percent, of the 1,128 closing land disposal facilities had actually closed; and only 105, or about 9 percent, had received post-closure

permits. The majority of these facilities—837—decided to close in November of 1985. Thus, most facilities, according to EPA regulations, should have completed closure by January 1987. Also, most facilities should have received post-closure permits by November 1988. EPA plans to increase the number of post-closure permits issued in fiscal year 1991, but it has no plans to also emphasize completing closures. Achieving timely closure of facilities that have ceased operations is important because the closure process involves stabilizing the facility, which precludes or minimizes the further spread of contamination. In addition, the owner/operators of some of these facilities have declared bankruptcy, increasing the possibility that several hundred millions of dollars in cleanup costs may ultimately be paid by the federal government.

EPA recognizes that land disposal facilities that are closing may pose some of the greatest environmental threats. However, the agency has also been legislatively mandated since 1984 to issue permits by certain deadlines to hazardous waste facilities seeking to continue operations, including land disposal facilities by November 1988, incinerators by November 1989, and treatment and storage facilities by November 1992. EPA has made limited progress in completing closures and issuing post-closure permits primarily because it has concentrated its regulatory efforts on issuing permits to facilities seeking to continue operations.

EPA implemented the Environmental Priorities Initiative in fiscal year 1989 to assess and prioritize all hazardous waste facilities in order to focus scarce resources on facilities posing the greatest threat. However, EPA did not develop national criteria for what constitutes environmental threat, nor did it develop a uniform scoring system to rank facilities on the basis of this threat. Without these, EPA had limited assurance that its regions were accurately ranking facilities for corrective action. In February 1991, EPA proposed a new approach for evaluating environmental threat and for targeting its actions on facilities that will yield the greatest environmental results. This approach can help address the problems GAO identified, but its implementation needs to be closely monitored.

Principal Findings

Slow Progress in Closure Completions and Post-Closure Permitting

Of the 1,128 closing land disposal facilities, 837 decided to close in November 1985 because their owner/operators were unable or unwilling to apply for operating permits and certify compliance with groundwater monitoring and financial responsibility requirements. Under EPA regulations, most of these facilities should have completed closure by January 1987. However, as of February 1991, only 337, or 30 percent, of the 1,128 closing land disposal facilities had completed closure.

EPA has also made limited progress in issuing post-closure permits. As of February 1991, only 105 post-closure permits had been issued. Post-closure permits should have been issued to the majority of closing facilities by November 1988. EPA estimates that it could take until 2004 to issue the remaining post-closure permits.

EPA's limited progress in completing closures at land disposal facilities is troubling since EPA believes they are a serious environmental threat and since 22 RCRA facilities have already been transferred to Superfund—a program designed to clean up the nation's most contaminated facilities. According to EPA estimates, it could cost an average of $26 million to clean up a Superfund facility, half of which may ultimately be paid by the federal government.

Setting Priorities for Cleanup

GAO found that in four EPA regions it visited, EPA had not ensured that the facilities posing the greatest environmental threat were being accurately identified and prioritized for corrective action under the Environmental Priorities Initiative. EPA had not established a systematic method—i.e., national criteria and a uniform scoring system—for ranking facilities according to their environmental threat. As a result, each regional office used its own method or methods for prioritizing facilities. These methods contained weaknesses that precluded the regions from identifying their worst facilities. For example, three regions could not identify their worst facilities because they either (1) did not rank all facilities or (2) did not use a single method for ranking all facilities in the region.

Moreover, another RCRA priority, meeting the statutory deadline to issue permits to operating treatment and storage facilities by 1992, was preventing some EPA regions from initiating corrective action at the

worst facilities first. Under RCRA, corrective action, if needed, must be initiated as a condition for a facility to obtain a permit. Some regions were initiating corrective action at treatment and storage facilities to meet the RCRA operating permit deadline even though other regional facilities, such as some closing land facilities, posed a greater environmental threat.

Recognizing these problems, in February 1991, EPA announced that it plans to adopt a new approach—including national criteria and a uniform scoring system—for evaluating the environmental threat or significance of facilities and for deciding which facilities should be acted on first for permits and corrective action. Under EPA's proposed approach, priority will be based on (1) environmental significance (especially keyed to the need for cleanup), (2) potential environmental benefits to be gained or risks avoided from permitting-related actions, and (3) other considerations, such as a facility's enforcement/compliance history and financial status. EPA is not, however, planning to define how the scores for these criteria are to be weighed in prioritizing facilities. EPA also recognizes that it needs to work closely with the Congress in implementing its new approach for dealing with hazardous waste facilities.

Recommendations

To minimize the further spread of contamination at closing land disposal facilities, GAO recommends that EPA place greater emphasis on completing closure by establishing goals or targets.

GAO also recommends that the Administrator, EPA, closely monitor the regions' and states' implementation of the proposed new approach for evaluating environmental threat and for deciding which facilities to act on first to ensure consistent interpretation. As part of this monitoring, EPA should assess the need for further guidance to define how the criteria of environmental significance, environmental benefits, and other considerations are to be weighed.

Agency Comments

GAO discussed the factual information presented in this report with EPA officials, who generally agreed that it was accurate. Their comments have been incorporated into the report where appropriate. As requested, GAO did not obtain official comments on the report.

Contents

Abbreviations

CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
EPA	Environmental Protection Agency
EPI	Environmental Priorities Initiative
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
STARS	Strategic Targeted Activities for Results System

Introduction

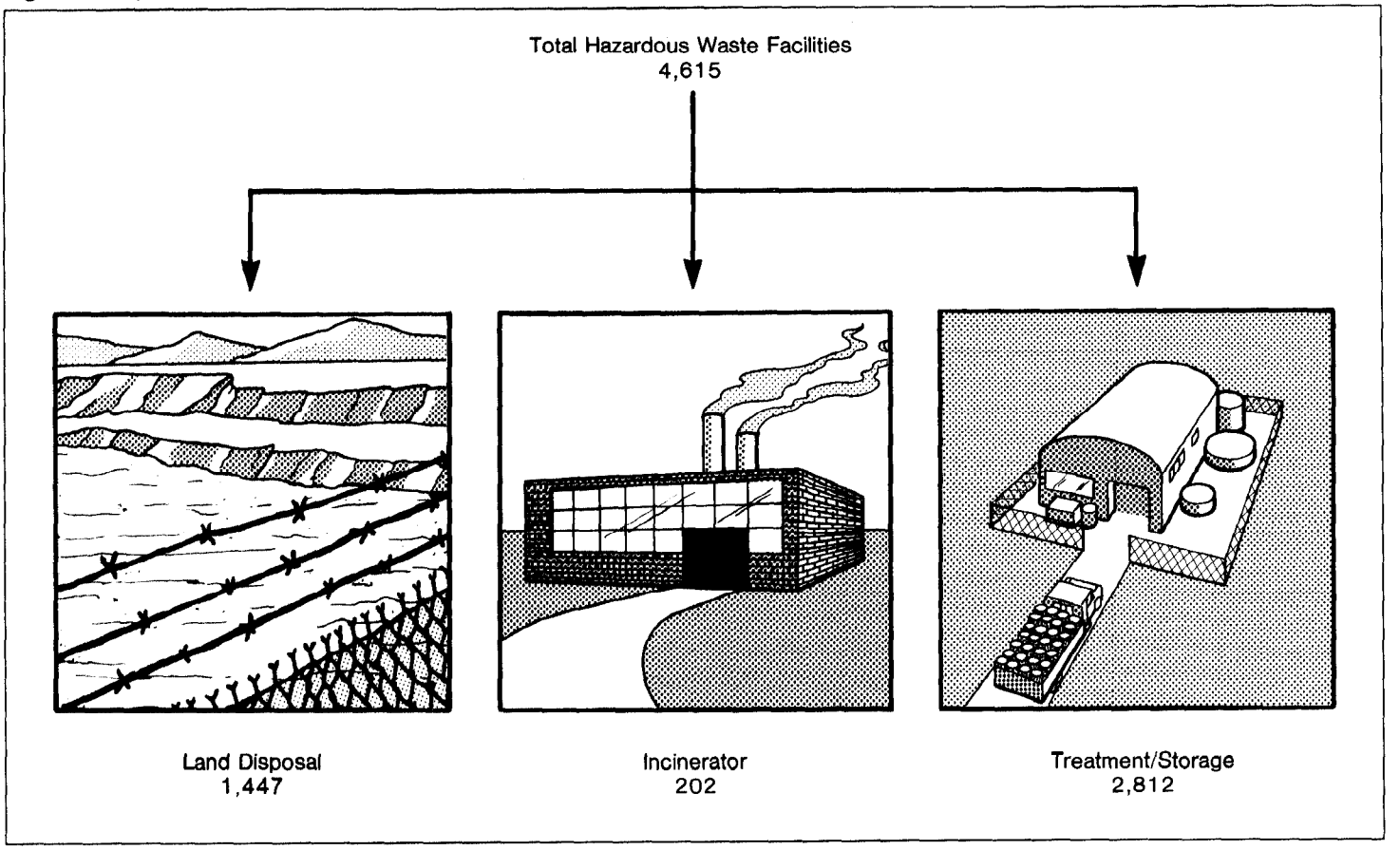
About half of the 4,615 facilities nationwide that treat, store, or dispose of hazardous waste are closing their hazardous waste operations because they are unable or unwilling to meet federal requirements. The 2,282 hazardous waste facilities that are closing may have some of the worst environmental problems in the nation. Also, many of the owner/operators of these facilities may be financially unable to pay for correcting the environmental problems at their facilities. Unless these facilities are closed and cleaned up in a timely manner by the owner/operators, they will continue to threaten human health and the environment, and many could become future Superfund sites requiring cleanup at government expense. The Resource Conservation and Recovery Act (RCRA), as amended, addresses these facilities. One of its major purposes is to ensure that facility owner/operators who do not meet standards close their hazardous waste operations as early as possible to prevent future contamination and to clean up present contamination.

The Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, is concerned about whether the Environmental Protection Agency (EPA) is taking appropriate steps to ensure that closing facilities are minimizing the risks to human health and the environment. Therefore, the Chairman of the Subcommittee requested that we determine EPA's (1) progress in closing and cleaning up facilities that are ceasing their hazardous waste operations and (2) efforts to set priorities for which facilities should be cleaned up first.

Why Hazardous Waste Facilities Are Closing

RCRA requires EPA to implement a comprehensive regulatory program for managing hazardous waste, from its generation to its disposal. Three types of hazardous waste facilities are subject to waste management regulations—land disposal, incinerator, and treatment and storage facilities. As of February 1991, 4,615 hazardous waste facilities were subject to RCRA requirements. (See fig. 1.1.)

Figure 1.1: Types of Hazardous Waste Facilities



Note: The total number includes 154 facilities that could not be classified by facility type because of insufficient information in EPA's data bases.

Under RCRA, every person owning or operating a hazardous waste facility that was in existence as of November 1980 must obtain a permit that, among other things, states the conditions under which the facility may operate. Recognizing that it would take time to issue permits to all existing hazardous waste facilities, however, facilities were allowed to continue operating under interim status until final permits could be issued. Facilities with interim status must comply with certain operating and other good housekeeping practices. To receive final operating permits, however, facilities must comply with more stringent facility-specific standards, such as those for groundwater monitoring.

Dissatisfied with EPA's limited progress in implementing the RCRA program, which was legislatively mandated in 1976, the Congress enacted

major changes to it in 1984. Among other things, the Congress addressed the slow pace in issuing final operating permits. To accelerate the issuance of permits, the 1984 amendments established deadlines by which owner/operators of hazardous waste facilities had to apply for and obtain operating permits, or otherwise lose their interim status and be forced to cease hazardous waste operations. Under the amendments, owner/operators of land disposal facilities had to apply for operating permits and to certify compliance with interim status requirements for groundwater monitoring and financial responsibility[1] by November 1985, or lose their interim status to operate. The 1984 amendments also required EPA to issue final permits to land disposal facilities by November 1988. Similar deadlines for loss of interim status and permitting were established for incinerator and treatment and storage facilities. Generally, these facilities were required either to obtain permits or to cease hazardous waste operations by November 1989 and November 1992, respectively.

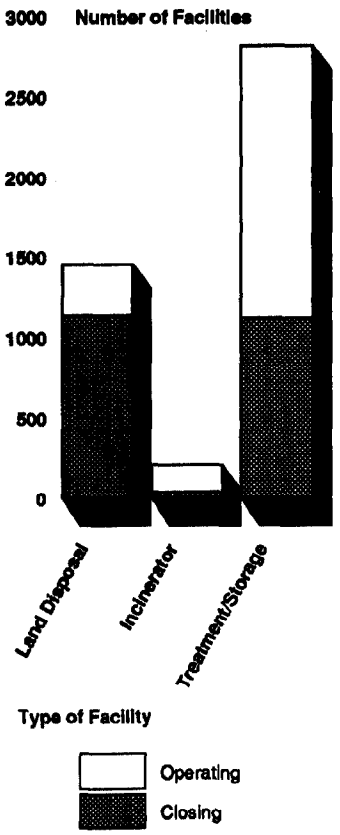
Under EPA regulations, facilities required to cease operations must close in accordance with certain standards and time frames in order to control or minimize any further spread of contamination. In addition, the 1984 amendments greatly expanded the responsibility of owner/operators to clean up contamination at their facilities. The legislation required all hazardous waste facilities, whether they plan to continue operating or to close, to clean up any contamination that had resulted from either their ongoing or past waste management practices. Because of these expanded requirements, the cleanup activities required at facilities dramatically increased.

Status of Hazardous Waste Facilities

As of February 1991, 2,282, or about half, of the 4,615 hazardous waste facilities had either decided to close or had closed their operations. As shown in figure 1.2, 1,128, or 78 percent, of land disposal facilities; 39, or 19 percent, of incinerator facilities; and 1,115, or 40 percent, of treatment and storage facilities are closing.

[1]Under the financial responsibility requirements, owner/operators must demonstrate that adequate funds are available to provide for the proper closure and post-closure monitoring of a facility and to cover third-party liabilities arising from facility operations.

Figure 1.2: Closing Facilities by Type of Facility



Note: Does not include 154 facilities that could not be classified by facility type because of insufficient information in EPA's data bases.

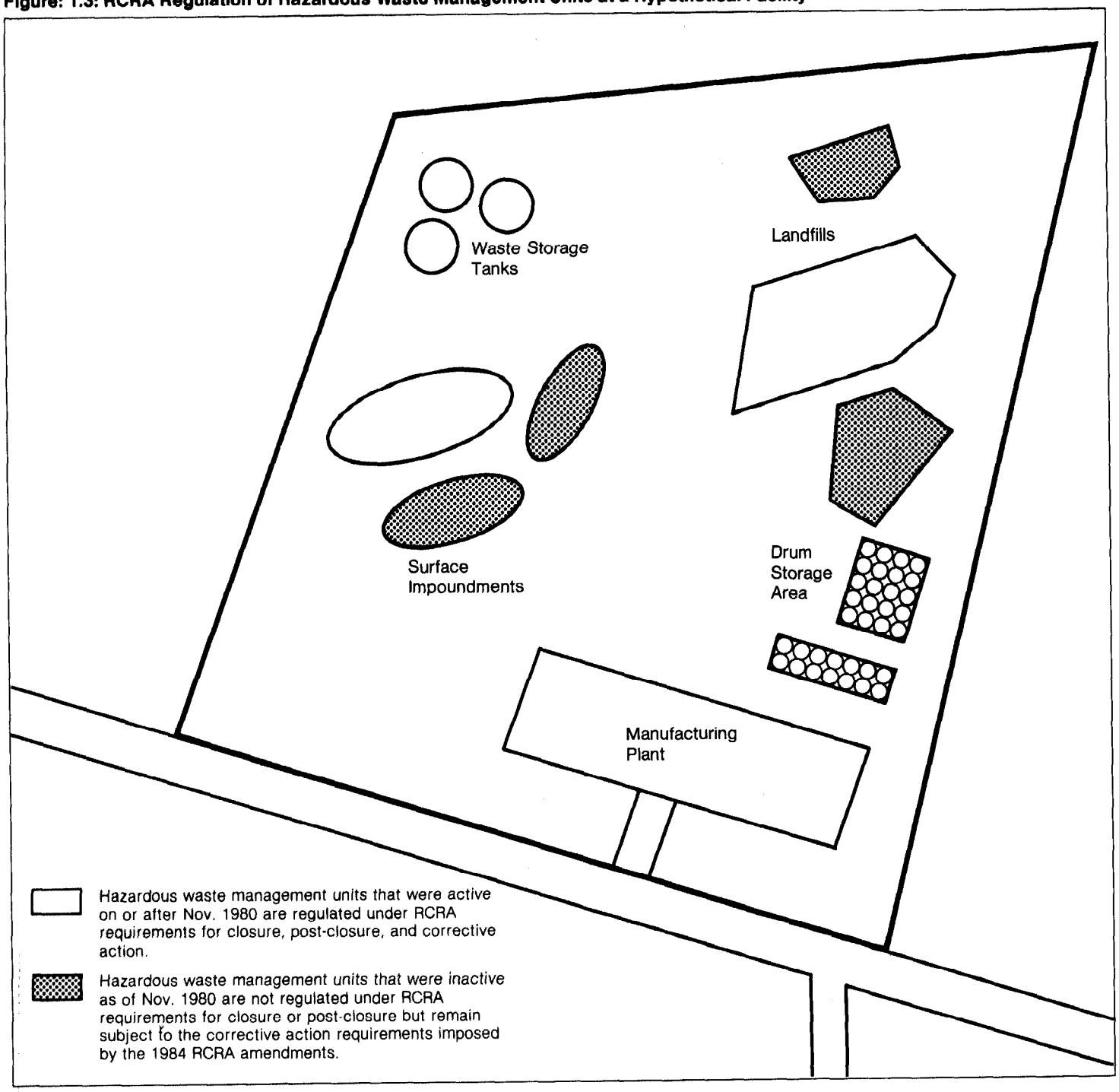
Hazardous Waste Facilities Operations

The operations of hazardous waste facilities, including closing facilities, are often complex. Since various methods are used to dispose of, incinerate, treat, and store many different types of hazardous waste, a hazardous waste facility may include many waste management units. These waste management units may be landfills, surface impoundments, waste piles, tanks, or container storage areas. In addition, many facilities in operation over a long period have changed waste management practices, with the owner/operators ceasing to use some waste management units and creating others to, for example, increase facility capacity or manage other types of waste.

RCRA regulations, effective in 1980, were designed to manage active or ongoing hazardous waste operations and not those that had ceased operating. For example, a facility that had been in operation since 1960 may have managed hazardous waste at 20 different waste management units between 1960 and 1980. When the RCRA regulations became effective, the facility may have had 5 active or ongoing waste management units and 15 other units that had ceased operations prior to 1980. RCRA regulations, including closure requirements, applied only to the five active waste management units.[2] Although only regulated waste management units are subject to closure requirements, all waste management units, whether regulated or nonregulated, have been subject to cleanup or corrective action requirements since 1984. Most hazardous waste facilities, including closing facilities, include both regulated and nonregulated waste management units. (See fig. 1.3.)

[2]For the purpose of this report, waste management units active as of 1980 are referred to as regulated units and those that were inactive as nonregulated units.

Figure: 1.3: RCRA Regulation of Hazardous Waste Management Units at a Hypothetical Facility



RCRA Requirements for Closing Facilities

To prevent owner/operators of closing facilities from abandoning their hazardous waste operations without protecting public health and the environment, EPA requires them to conduct three important regulatory activities: (1) closing the regulated waste management units to prevent or minimize the further escape of contamination to the environment, (2) conducting long-term groundwater monitoring and cleanup activities under a post-closure permit at the regulated units to assess and clean up any contamination that may have resulted from leaving waste in place, and (3) undertaking any necessary cleanup or corrective action for contamination resulting from past waste management practices at the non-regulated waste management units.

Closure Requirements

EPA defines closure as the period during which an owner/operator of a hazardous waste facility stops using and actually closes its regulated waste management units. The purpose of closure is to help ensure that these units are shut down in a manner that (1) controls, minimizes, or eliminates the potential escape of hazardous waste into the environment and (2) minimizes the need for care after closure.

During closure, all waste is either removed or left in place. If waste is left in place, a final cover is placed over the waste to minimize the further migration of the waste to groundwater and surface water, soil, and the atmosphere. EPA requires the owner/operator to submit for approval a closure plan that describes how the unit will be closed and the schedule for completion. The owner/operator is required to demonstrate adequate financial resources to carry out the closure.[3] Upon completion of closure, the owner/operator and an independent professional engineer are required to certify that closure was conducted in accordance with the approved closure plan.

Post-Closure Requirements

Land disposal facilities that close their regulated waste management units with waste in place are subject to EPA requirements for post-closure care and monitoring. Post-closure care is the 30-year period after closure during which owner/operators conduct maintenance and groundwater monitoring activities to ensure the integrity of the facility and to detect and clean up any contamination that may exist at the regulated waste units. Facilities subject to post-closure care must obtain

[3]To demonstrate adequate resources to cover closure costs, financial assurance may be provided through various mechanisms such as a trust fund, letter of credit, surety bond, insurance, or financial test.

post-closure permits, which formalize the site-specific requirements for post-closure care, including groundwater monitoring and cleanup of contamination.

Before EPA issues a post-closure permit to a land disposal facility, the owner/operator is required to assess the groundwater conditions at the regulated units to determine whether contamination exists, its nature and extent, and, if necessary, the need for cleanup measures. This assessment is needed to help ensure that groundwater contamination is properly defined and adequately monitored through an appropriate groundwater monitoring system. This assessment therefore provides the basis for site-specific groundwater monitoring and cleanup requirements included in the post-closure permit. Owner/operators of closing land disposal facilities subject to post-closure care are also required to provide financial assurance that such care will be provided for 30 years or more. Financial assurance may be demonstrated through mechanisms similar to those used for closure.

The 1984 Amendments Expanded the Number of Units Subject to Corrective Action

Prior to 1984, only regulated land disposal units, such as landfills, surface impoundments, and waste piles, were subject to corrective action or cleanup requirements. The 1984 RCRA amendments mandated that EPA require all hazardous waste facilities—both operating and closing—and all waste management units—both regulated and nonregulated—to be assessed to determine if they are leaking and require corrective action. The Congress had become concerned that all waste management units, regardless of when they operated, could be causing contamination.

As a result of the 1984 amendments, the number of waste management units as well as the number of hazardous waste facilities subject to corrective action increased dramatically. For example, EPA estimated that the average number of units per facility subject to cleanup requirements has increased 16-fold. Based on EPA data, the 2,282 closing hazardous waste facilities may contain as many as 36,500 waste management units that are potentially subject to corrective action.

Generally, facilities seeking to continue operations must address corrective action as a prerequisite to obtaining an operating permit. Closing land disposal facilities generally must undertake cleanup as a condition for obtaining a post-closure permit, while other closing facilities (incinerators and treatment and storage facilities) generally conduct cleanup in response to EPA enforcement authority granted under the 1984 amendments.

Relationship Between RCRA and Superfund

EPA has authority to respond to contamination at abandoned hazardous waste sites under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, commonly referred to as Superfund. Under Superfund, EPA can compel responsible parties to clean up the contamination or pay for the cleanup.[4]

RCRA and Superfund were designed as companion programs—RCRA was intended to regulate the management of hazardous waste, while Superfund was intended to clean up contamination at uncontrolled or abandoned sites. The Congress expected Superfund to be phased out eventually as abandoned hazardous waste sites were cleaned up, with the RCRA program remaining to prevent environmental problems at hazardous waste sites in the future. As of September 1990, there were about 1,200 Superfund sites. According to EPA data, the average cleanup cost of a Superfund site is about $26 million, and the estimated total cleanup cost for the current sites is about $31 billion.

As previously discussed, because the 1984 RCRA amendments significantly broadened EPA's authority to require corrective action, EPA may address corrective action at most facilities under either RCRA or Superfund. EPA's current policy, however, is to rely primarily on its RCRA authority to address corrective action at RCRA facilities and to limit its use of Superfund primarily to those RCRA facilities whose owner/operators are either bankrupt or unwilling to undertake corrective action.

Federal/State Partnership

At the federal level, EPA administers its permitting, closure, and post-closure activities through its 10 regional offices. Like many other environmental laws, RCRA encourages states to assume the responsibility for implementing and enforcing these activities and requires EPA to oversee the states' activities. EPA authorizes states to implement these activities if their program regulations are at least equivalent to the federal program and provide for adequate enforcement. In addition, the states may impose more stringent regulations than the federal government. As changes occur in EPA's authority and programs under RCRA, states are required to obtain EPA authorization to incorporate these changes into their state programs. As of January 1991, 45 states, the District of Columbia, and Guam had received authorization from EPA to administer permitting, closure, and post-closure activities. EPA administers the RCRA program in the remaining states and territories.

[4]Responsible parties include current and former owner/operators of the waste facility and generators of the waste.

Objectives, Scope, and Methodology

On the basis of a request from the Chairman of the Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, and subsequent discussions with the Chairman's office, we agreed to review EPA's

- progress in completing closures and issuing post-closure permits at closing land disposal facilities (see ch. 2.),
- efforts to set priorities for the cleanup of hazardous waste facilities posing the most significant environmental threat (see ch. 3.), and
- progress in assessing the extent of contamination and implementing cleanup at all closing hazardous waste facilities (see app. I.).

To accomplish the first objective, we obtained data from EPA's Hazardous Waste Data Management System on the status of closure activities at RCRA land disposal facilities. Our review focused primarily on land disposal facilities because they are believed to pose the greatest environmental threat and most of them should have completed closure by January 1987.[5] Closure data in the Hazardous Waste Data Management System includes whether the facility submitted a closure plan, and, if so, whether the plan was approved and the land disposal facility had completed closure. The system also includes data on whether the land disposal facility submitted a post-closure permit application and, if so, whether a post-closure permit was issued. The system's data tapes included closure and post-closure data as of February 1991.

We also met with officials responsible for RCRA permitting and enforcement activities at EPA headquarters and EPA Regions 3 (Philadelphia), 4 (Atlanta), 5 (Chicago), and 6 (Dallas) to discuss progress made in completing closure at hazardous waste facilities and issuing post-closure permits. These EPA regions account for about 65 percent of the total number of closing land disposal facilities.

To determine priorities and performance targets that EPA assigned to its closure program activities, we reviewed EPA's RCRA Operating Guidance for fiscal years 1987 through 1991. We also discussed closure program priorities and targets with EPA headquarters and regional officials.

We also obtained data from EPA's Hazardous Waste Data Management System to determine the compliance histories of closing land disposal

[5]Incinerator and treatment and storage facilities that will cease operations rather than meet the statutory permit deadlines are not, under EPA's regulations, generally required to complete closure until January 1991 and January 1994, respectively.

facilities with RCRA requirements for financial responsibility for fiscal years 1987 through 1990 (as of Mar. 1990). These enforcement data include whether a facility was in significant noncompliance with financial responsibility requirements and how long the facility has remained out of compliance. To determine whether delays in closing land disposal facilities increase the risk that they may become Superfund sites, we discussed with EPA headquarters officials EPA's policy on transferring RCRA facilities to Superfund, and obtained information on the number of facilities that have been transferred to the Superfund program.

To accomplish the second objective, we reviewed EPA's program for assessing and prioritizing the cleanup of hazardous waste facilities posing the most significant environmental threat—referred to as the Environmental Priorities Initiative (EPI). We chose EPA Regions 3, 4, 5, and 6 for our review because, according to available EPA data, these regions are likely to have the largest number of facilities needing corrective action. We met with regional RCRA permitting and enforcement officials and, in some cases, Superfund officials to discuss each region's approach and status in implementing EPI. We also reviewed EPI policies and guidance and examined statistics on its implementation in each region.

In addition, we met with RCRA and Superfund officials at EPA headquarters to obtain information on the development and oversight of EPI's implementation in the regions. We examined policy and guidance documents that headquarters distributed to the regions to implement the system. We also examined EPA's recommendations for improving the EPI, which were presented in EPA's July 1990 RCRA Implementation Study, and discussed these recommendations with the appropriate EPA officials. Under the RCRA Implementation Study, EPA comprehensively evaluated the progress made in implementing the RCRA hazardous waste program and key issues affecting the program's future.

To accomplish the third objective, we obtained data from EPA's Corrective Action Reporting System. These data covered all closing RCRA hazardous waste facilities—including land disposal, incinerator, and treatment and storage facilities. The data, as of February 1991, show the stage facilities have reached in the corrective action process.

Although we did not verify data obtained from either of the two EPA information management systems, we did follow up with regional office officials on certain data that were incomplete and, where appropriate, made certain adjustments in the closure and post-closure data to correct

for missing information. We also combined the data from the two information management systems to verify certain permitting data and to obtain more complete information on the universe of RCRA facilities subject to corrective action. EPA officials told us that these data systems were the best available information on the status of closure and corrective action at closing hazardous waste facilities.

We conducted our review between August 1989 and February 1991 in accordance with generally accepted government auditing standards, except that we did not verify EPA's data bases or internal controls. We discussed the factual information presented in our report with EPA headquarters officials responsible for EPA's closure and corrective action activities. They generally agreed with the data presented, and their comments were incorporated where appropriate. As requested, however, we did not obtain official comments on this report.

Limited Progress Made in Closing Land Disposal Facilities

To eliminate or minimize the spread of contamination at hazardous waste land disposal facilities that are scheduled to close, EPA requires the owner/operators to close their regulated waste management units in a timely manner and obtain post-closure permits to monitor and clean up contamination. As of February 1991, owner/operators of 1,128 land disposal facilities were scheduled to close rather than to seek permits for the continued operation of their facilities. However, only 337, or 30 percent, of the 1,128 closing hazardous waste land disposal facilities had closed and only 105, or 9 percent, had been issued post-closure permits. Since the majority of these facilities—837—decided to close in November 1985, most facilities should have closed, according to EPA criteria, by January 1987 and received post-closure permits, according to RCRA, by November 1988.

EPA has made limited progress primarily because it has concentrated its resources on higher priority activities, such as issuing permits to operating facilities. In fiscal year 1991, however, EPA is placing more emphasis on addressing environmental problems at closing land disposal facilities by setting priorities for issuing post-closure permits. However, EPA does not plan to increase its priority for ensuring that these facilities are closed in a timely manner. Unless completing closures are given greater emphasis, land disposal facilities that should already be closed may continue to spread contamination, increasing the cost of cleanup. If owner/operators are unable or unwilling to finance the necessary cleanup, EPA will have to transfer cleanup responsibilities to the Superfund program; consequently, the federal government could eventually pay millions of dollars in cleanup costs.

Timely Closure Is Critical

Land disposal facilities scheduled for closure can pose a serious environmental threat, particularly for groundwater contamination. Many hazardous waste land disposal units, such as landfills and surface impoundments, were constructed prior to RCRA requirements and do not meet current standards. For example, they may not have liners to prevent the release of hazardous waste into the groundwater. Because facilities that continue operation must generally meet more stringent requirements, owner/operators of many land disposal facilities, according to EPA, chose to cease operations because it was too difficult or costly for them to comply with RCRA operating requirements. However, many closing land disposal facilities are still not in compliance with RCRA's interim status requirements for groundwater monitoring and

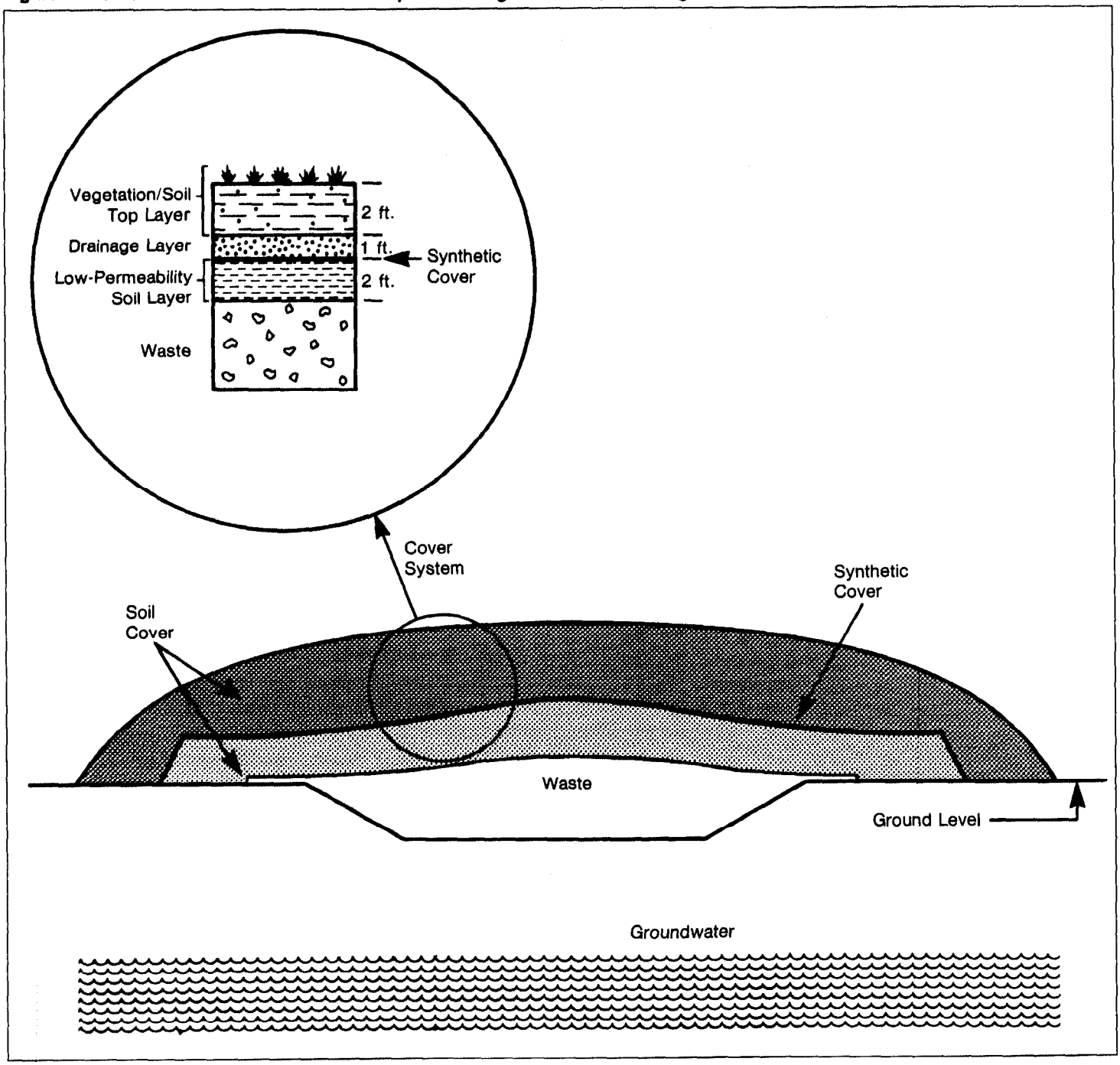
financial responsibility. For these reasons, according to EPA, the environmental problems at closing land disposal facilities may be greater than problems at land disposal facilities that continue to operate.

Completion of closure is the critical first step in providing a minimum level of environmental protection at closing land disposal facilities. Completion of closure does not mean that a facility cannot cause future environmental harm, nor does it necessarily include cleanup of all hazardous waste releases. Closure, however, is a necessary first step that generally has to occur before the long-term cleanup of a facility is addressed. Because closure with waste in place does not eliminate the threat of groundwater contamination, owner/operators of land disposal facilities are required to obtain post-closure permits to provide for long-term monitoring and post-closure care of the regulated land disposal units.

Under EPA regulations, facilities may close their hazardous waste units either by removing all waste or leaving waste in place. Incinerator and treatment and storage facilities generally close their hazardous waste units by removing all waste and possible contamination—a process commonly referred to as clean closure. Land disposal facilities, however, are normally unable to remove all waste and contamination at their regulated units. Land-disposed waste tends to migrate into the soil and groundwater, making it impractical or expensive to remove all waste and contamination. Because land disposal facilities usually leave waste in place, closure at these facilities generally involves placing a highly impermeable cap or cover over the units to minimize the infiltration of rainwater into the unit, thereby minimizing the formation and further migration of leachate[1] from the unit to groundwater. EPA considers a properly designed and constructed cover essential to minimize or prevent the spread of contamination at closing land disposal units. Figure 2.1 shows a closed hazardous waste land disposal unit, including a cross-sectional view of the cover over the unit.

[1]Leachate is any liquid, including suspended components in the liquid, that has percolated through or drained from hazardous waste.

Figure 2.1: Closed Hazardous Waste Land Disposal Management Unit, Including Cross-Sectional View of the Cover

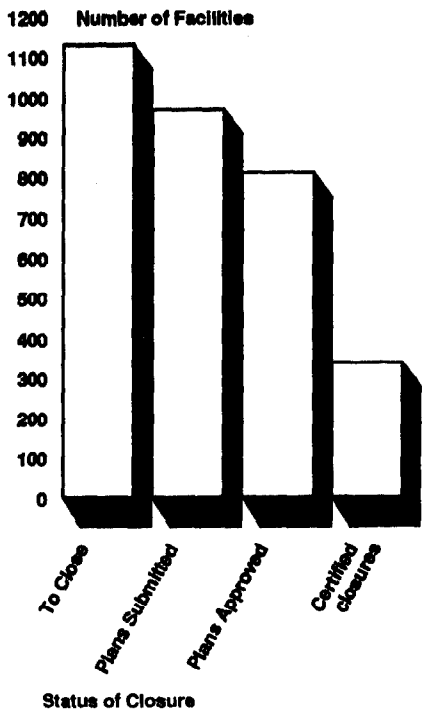


Little Progress Made in Completing Closures

EPA requires the closure of hazardous waste management units to be completed within 14 months after a facility has decided to close them. Generally, closure plans are to be approved within 180 days of their submission and all closure activities are to be completed 180 days after plan approval. However, the regulations allow extensions to be granted if the owner/operator successfully demonstrates that closure activities will necessarily take longer to complete. In addition, within 60 days of completion of closure, the owner/operator and an independent professional engineer must certify that the facility has been closed in accordance with the approved plan.

Figure 2.2 shows the status of the 1,128 land disposal facilities that were closing as of February 1991. Over 85 percent, or 968, of the 1,128 closing facilities had submitted closure plans. EPA had in turn approved closure plans for 809 of the facilities. However, only 337 of the facilities had certified that closure had been completed. Since the majority of these facilities—837—decided to close in November 1985, most facilities should have completed closure within 14 months, or by January 1987, according to EPA's regulations.

Figure 2.2: National Closure Statistics for Land Disposal Facilities, as of February 1991



Note: Data do not include (1) 116 facilities that continue to operate some active land disposal units while closing others and (2) 255 facilities that have certified the clean-closure of their facilities by attempting to remove all waste.

Completing closure is critical to halting the spread of contamination at facilities. Otherwise, contamination will continue to spread, resulting in increased cleanup costs. In the absence of financially responsible parties to pay for cleanup, these facilities could become Superfund sites.

Closure Completions Have Not Been Given Priority

Limited attention has been given to completing the closure of land disposal facilities. According to the Deputy Director of EPA's Permits and State Programs Division, who has overall responsibility for the closure of hazardous waste facilities, EPA has neither tracked nor assigned specific targets to the number of land disposal closures to be completed in

its formal information tracking system—the Strategic Targeted Activities for Results System (STARS).[2] According to the Deputy Director, EPA has primarily focused on approving closure plans for closing land disposal facilities rather than on the closure of these facilities. EPA's operating guidance, which establishes the agency's annual program priorities for the implementation of the RCRA program during fiscal years 1987 through 1991, supports this observation. In each of these years, EPA established specific targets through STARS to ensure that its regional offices and states made progress in approving closure plans. Because it exceeded its targets during fiscal years 1987 through 1990, EPA increased the number of land disposal facilities with approved closure plans from fewer than 200 facilities at the close of fiscal year 1986 to over 800 facilities as of February 1991. However, EPA had not emphasized ensuring closure completions in the annual operating guidance nor established such completions as targets in STARS.

Because EPA has not routinely monitored and tracked regional offices' and states' progress in completing closures, the Deputy Director said EPA had been unaware of the relatively low number of land disposal facilities that had certified that closure had been completed. The Deputy Director believes that the percent of facilities actually completing closure may be higher than EPA's information system shows. If an activity is not designated as a targeted activity in STARS, he told us, the regional offices and states often do not accurately and comprehensively record and enter data into the system. The Deputy Director said that to obtain accurate data on the number of closure completions, EPA would have to survey closure activities in each of its regional offices. In January 1991, EPA undertook such a survey—the results of which had not been completed at the conclusion of our work.

Increased Likelihood That Facilities Will Be Transferred to Superfund

To meet RCRA financial responsibility requirements, owner/operators must prepare written cost estimates for closing and providing post-closure monitoring of their facilities. These estimates are to reflect the actual cost of conducting all activities outlined in the closure and post-closure plans and are adjusted annually for inflation. The owner/operators must then demonstrate to EPA that they can pay the estimated

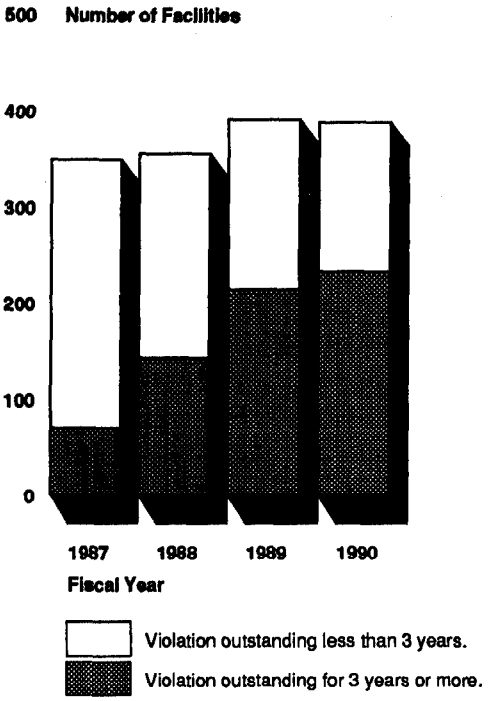
[2]STARS is an EPA accountability system, and because it emphasizes the tracking of selected, results-oriented activities, additional staff and funds are provided for targeted activities. Under STARS, EPA establishes measures or targets each year to track progress of selected high-priority activities. Progress toward the set goal is monitored on a quarterly basis and reported in STARS, where programmatic activities are closely observed.

amounts as well as compensate third parties for bodily injury and property damages caused by sudden and non-sudden accidents.

According to our review of the compliance histories of closing land disposal facilities, however, about 385, or about one-third, of the 1,128 closing land disposal facilities were not in compliance with financial assurance requirements as of March 1990. Also, many of these facilities' financial assurance violations were at least 3 years old.

From fiscal year 1987 through March 31, 1990, between 349 and 390 of the 1,128 closing land disposal facilities were not in compliance with financial assurance requirements each year (see fig. 2.3), according to EPA compliance data. As figure 2.3 also shows, the number of facilities with financial assurance violations for 3 years or longer is growing. For example, 70 facilities were in violation for 3 or more years in fiscal year 1987, compared with 232 facilities in fiscal year 1990. In a recent internal study, EPA has concluded that many facilities that are in significant noncompliance with EPA's regulations will remain so because of their tenuous financial situation. The inability of these facilities to comply may mean that they will not be in a financial position to pay for closure and possible cleanup, and may become Superfund sites.

Figure 2.3: Closing Land Disposal Facilities in Noncompliance With Financial Responsibility Requirements, Fiscal Years 1987 Through March 31, 1990



As of August 1990, 22 hazardous waste facilities, formerly regulated under RCRA, had been transferred to the Superfund program for cleanup because the owner/operators of the facilities were either bankrupt or unable or unwilling to pay for cleanup. According to EPA testimony in September 1990,[3] the average cost of cleaning up a Superfund site is $26 million. As a result, the cost to clean up just the 22 RCRA facilities transferred to Superfund could be about $600 million. EPA estimates that half of this cost, or $300 million, could eventually be paid by the federal government.[4]

[3]Testimony of the EPA Assistant Administrator for Enforcement before the Subcommittee on Policy Research and Insurance, House Committee on Banking, Finance, and Urban Affairs (Sept. 27, 1990).

[4]Superfund will absorb cleanup costs only when financially viable responsible parties cannot be found or when the funds of responsible parties are insufficient to cover the entire costs of cleanup.

Little Progress Made in Issuing Post-Closure Permits

EPA requires that a land disposal facility that has completed closure be issued a post-closure permit if hazardous waste is to remain in place. EPA established post-closure permit requirements for land disposal facilities because of their potential for environmental problems after they are closed. However, as of February 1991, only 105, or 9 percent, of the land disposal facilities scheduled for closure had been issued post-closure permits. Post-closure permits were to have been issued to most closing land disposal facilities by November 1988.

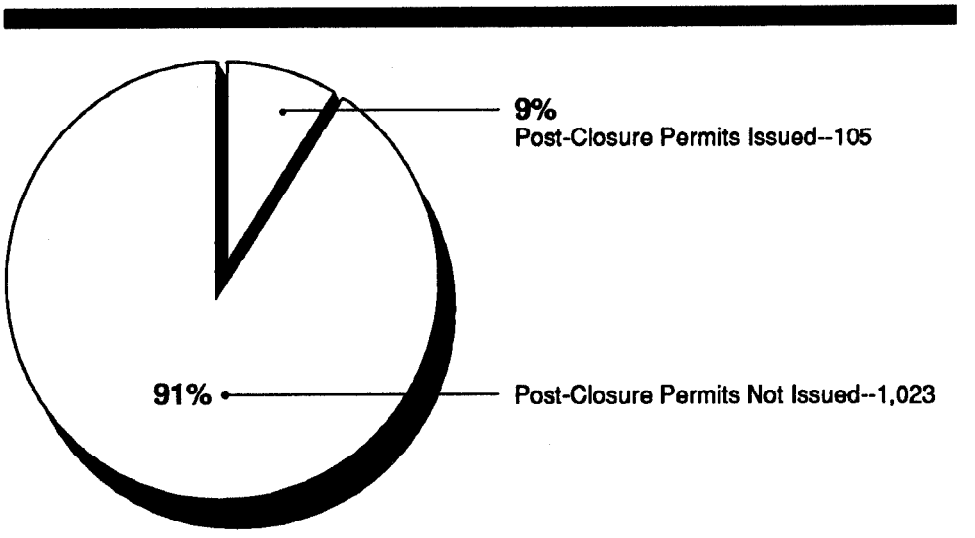
Until closing land disposal facilities receive post-closure permits, they remain subject to the requirements applicable to interim status facilities. Interim status requirements, specifically as they apply to cleanup of releases from a facility's regulated units, are less stringent than the requirements for permitted facilities. For example, EPA's interim status regulations do not require corrective action for releases from a closing facility's regulated units. In addition, until the post-closure permit is issued, EPA generally does not require that owner/operators begin cleanup of contamination at a facility's nonregulated units. Until facilities receive post-closure permits, EPA's tools for requiring the cleanup of contamination at both regulated and nonregulated waste management units are limited to issuing enforcement orders.[5] According to EPA, the post-closure permit is the preferred approach for carrying out the long-term oversight of a facility's cleanup, and the agency anticipates that post-closure permits will serve as the primary mechanism for the majority of corrective actions at closing land disposal facilities. However, EPA has made little progress in issuing post-closure permits.

Status of Post-Closure Permits

As figure 2.4 shows, as of February 1991, 105, or 9 percent, of the 1,128 closing land disposal facilities had been issued post-closure permits. However, most post-closure permits should have been issued by November 8, 1988, according to a July 1986 EPA Office of General Counsel memorandum. This deadline is the same as that required for issuing operating permits to land disposal facilities seeking to continue operations.

[5]As of Feb. 1991, according to EPA data, enforcement orders had been issued at 142 closing land disposal facilities to initiate corrective action or cleanup.

Figure 2.4: Closing Land Disposal Facilities With Post-Closure Permits, as of February 1991



Note: Data exclude (1) 116 facilities classified as operating facilities because they have both operating and closing units and (2) 255 facilities that tried to clean-close, but must be reevaluated to determine if post-closure permits will be required.

Over the years, EPA's priorities have been directed to issuing operating permits—first to land disposal facilities by November 1988, then to incinerators by November 1989, and now to treatment and storage facilities by November 1992. The post-closure permitting of closing land disposal facilities has not been a priority. In hearings before the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, in April 1989, EPA explained that post-closure permitting was extremely time-consuming, taking up to 4 years to complete at each facility. EPA stated that because they no longer wish to operate such facilities, the owner/operators have little incentive to provide EPA with the data needed to make permit determinations. EPA cited the need to develop sufficient information to adequately characterize groundwater conditions at closing facilities as a significant factor in delaying post-closure permit issuance.

In May 1989, the Environmental Defense Fund, a not-for-profit environmental public interest group, filed a civil suit against EPA, alleging, among other things, that the agency had not, as required, issued post-closure permits to closing land disposal facilities by November 8, 1988. The Environmental Defense Fund sought a court order directing EPA to issue these permits. In February 1990, the court ordered that the discovery process—that is, the exchange of information between EPA and

the Environmental Defense Fund—continue. As of February 1991, the case was still pending.

Post-Closure Permits Now a Higher Priority

For fiscal year 1991, EPA's operating guidance stated, for the first time, that post-closure permits would be a high-priority activity. Specifically, EPA stated that targets for issuing post-closure permits would be established as part of STARS to hold the regions and states accountable for issuing post-closure permits and to track the regions' and states' progress in issuing these permits. For fiscal year 1991, EPA has established a target of issuing 52 post-closure permits. Nevertheless, EPA has estimated that it may take until 2004 to issue the remaining land disposal post-closure permits.

Conclusions

EPA has made limited progress in completing the closure of land disposal facilities. Many of these facilities pose especially difficult environmental and compliance problems. By eliminating or minimizing the spread of contamination, closure provides an important first step in protecting the environment from the threat posed by these facilities.

As of February 1991, however, only 337, or 30 percent, of the 1,128 closing land disposal facilities had completed closure. Since the majority of these facilities—837—decided to close in November 1985, most facilities should have completed closure by January 1987, or about 4 years ago. Such limited progress may have serious consequences, environmental as well as financial. If owner/operators do not close these facilities in a timely manner, many facilities may ultimately be transferred to Superfund for cleanup at the federal government's expense. The estimated cost to the federal government of cleaning up the 22 RCRA facilities that have already been transferred to Superfund could be about $300 million.

EPA has made limited progress in completing closure because it has focused on other activities that it considers to be of higher priority, such as issuing permits to operating facilities. To address the environmental concerns at closing facilities, EPA has, for fiscal year 1991, established targets for the number of post-closure permits to be issued. However, EPA does not currently plan to place a similar priority on completing closures. Because targets have been an effective tool in getting closure plans approved, we believe that establishing targets for closure completions would provide greater assurance that the environmental threat at

closing land disposal facilities will be minimized in a timely manner. Without such targeting, completing closures seems far from certain.

Recommendation

To minimize and control contamination at closing land disposal facilities, we recommend that the Administrator, EPA, establish targets in its Strategic Targeted Activities for Results System for completing closure of these facilities.

Facilities Posing the Worst Environmental Threat May Not Be Identified or Receive Corrective Action

EPA developed the Environmental Priorities Initiative (EPI) in 1989 to help ensure that facilities posing a serious environmental threat were identified for corrective action in priority order. Before the implementation of the EPI, EPA regions focused their efforts on initiating corrective action for facilities that needed operating permits by statutory deadlines. In developing the EPI, however, EPA did not provide the regions with national criteria and a method for ranking facilities by the seriousness of their problems. Consequently, regions developed their own ranking methods. Without national criteria and a national scoring system for determining environmental threat, EPA had limited assurance that the regions were accurately ranking their facilities for corrective action.

Regions varied extensively in how they implemented the EPI. For example, each of the four regions we reviewed had a different method(s) for ranking facilities. Specifically, the regions differed in the criteria they chose for determining environmental threat and in the weights they assigned to these criteria. Consequently, facilities posing a similar threat to the environment may be ranked differently by region for corrective action. Furthermore, the method(s) used by some regions had weaknesses that prevented them from ensuring that they had accurately ranked facilities by the seriousness of their threat.

Moreover, even if the facilities posing the greatest environmental threat were being identified, EPA could not be assured that these facilities would receive corrective action first. EPA faces another RCRA priority—initiating corrective action at operating treatment and storage facilities in order to meet the 1992 statutory permitting deadline. This deadline is preventing some EPA regions from initiating corrective action at their worst facilities—generally land disposal facilities that have closed or are in the process of closing—first.

In July 1990, EPA issued a study corroborating our findings about the lack of consistency among its regional offices in evaluating the environmental threat of facilities and in setting priorities for corrective action.[1] To ensure that the regions are accurately identifying and acting on the worst facilities, EPA has concluded that it needs a national approach for evaluating the risks posed by facilities and for deciding which ones to act on first. In February 1991, EPA announced its plans to adopt uniform

[1]The Nation's Hazardous Waste Management Program at a Crossroads. The RCRA Implementation Study (July 1990).

national criteria for evaluating the environmental threat posed by facilities. Also, in February 1991, EPA proposed that a new approach—one that emphasizes environmental results—be adopted for deciding which facilities should be acted on first for permits and corrective action. EPA's proposed changes should, if properly implemented, address many of the problems that it has encountered in implementing the EPI. Our work, however, suggests that EPA's proposed changes may not go far enough in ensuring that priorities are set consistently for all facilities across all regions. Also, EPA will need to work closely with the Congress to implement many of its proposed changes.

The EPI Program

In 1989, EPA established the EPI to accelerate efforts to identify and prioritize hazardous waste facilities needing corrective action. Prior to initiating the EPI, EPA had begun corrective action at only about 325 hazardous waste facilities—leaving approximately another 4,300 operating and closing hazardous waste facilities that needed to be assessed for cleanup. Of particular concern were facilities that might be overlooked while the regions focused their efforts on facilities seeking operating permits. Under the 1984 RCRA amendments, EPA was required to issue permits to land disposal facilities by November 1988, incinerators by November 1989, and treatment and storage facilities by November 1992. Since 1984, this requirement has set EPA's agenda for identifying and cleaning up contamination at facilities because the 1984 RCRA amendments require that corrective action occur as a prerequisite for obtaining a permit.

EPA was concerned that facilities not scheduled to receive operating permits in the near future as well as facilities that were closing needed to be reviewed for corrective action. The facilities, many of which were closing, according to EPA, posed a greater threat to the environment than those seeking operating permits. EPA recognized that it would be many years before this larger group of facilities would be assessed, permitted, and cleaned up, given the resources EPA was devoting to issuing operating permits. The EPI is intended as a way to direct resources to facilities that otherwise might not be addressed for corrective action for many years.

Under the EPI, regions must establish a priority order for all hazardous waste facilities so that they know which facilities should be required to initiate corrective action first. EPA regions are to assess facilities not yet assessed for corrective action to identify any potential and actual contamination. Rather than using the RCRA assessments traditionally used

for RCRA facilities, regions are to use Superfund assessments, which provide similar information. Superfund is being used, in part, because it has a larger pool of funds available for assessments.[2] Regions are expected to rank facilities as they are assessed to determine their relative environmental threat. EPA expects each region to develop a list of its priorities and initiate corrective action at the worst facilities through permits, or—for facilities not requiring permits—through enforcement orders.

The EPI Did Not Ensure That the Worst Facilities Were Identified

In implementing the EPI, EPA did not establish nationwide criteria or a systematic method for regions to use in determining the environmental significance or threat of facilities. Rather, EPA generally left implementation to each of the 10 regions, without providing adequate oversight. Each of the four regions we reviewed used a different method(s) to prioritize facilities, and we found weaknesses in these methods. Given this diversity, EPA did not have adequate assurance that its regions were accurately and consistently ranking the environmental threat of their facilities. Recognizing these problems, in February 1991, EPA announced its plans to establish uniform national criteria and a systematic scoring system for determining the environmental significance of facilities.

Regions Differ in Evaluating Environmental Threat

Because the EPI did not include national criteria and a scoring system for ranking facilities on the basis of environmental threat, the regions developed their own methods. The four regions we reviewed used methods for prioritizing facilities for corrective action that differed in (1) the criteria used to evaluate environmental threat and (2) the scoring systems for measuring the criteria. For example, one region did not include criteria for evaluating the toxicity of the waste; the three other regions had criteria for evaluating toxicity. As a result, the three regions using toxicity criteria might assign a higher priority to facilities with highly toxic waste than the fourth region would assign to facilities with similar waste.

Second, we found that regions differed in the weights they assigned to the criteria. One region gave the most weight to the number of waste management units at a facility, according to a regional official. In contrast, another region weighed region-specific geographic information more heavily—e.g., whether a facility was near an important body of

[2]EPA can perform Superfund assessments at any potential Superfund site, according to EPA officials. Under EPA policy, potential Superfund sites include RCRA facilities with a bankrupt owner/operator or one unwilling to undertake corrective action.

surface water or over an important source of groundwater, according to regional officials. As a result, these two regions may differ in the types of facilities they ranked high. The first region may find that large facilities with many waste management units pose the highest threat while the second region may consider facilities near an important body of surface water or groundwater as posing the highest threat.

Regional Methods Did Not Identify Worst Facilities

In addition to differing from region to region, the regional EPI methods contained weaknesses that precluded three of the four regions from identifying the worst facilities in the region. Only one region could identify its worst facilities because it was the only region that used a single method to rank all its facilities requiring corrective action. The remaining three regions could not identify their worst facilities because they either (1) did not rank all facilities or (2) did not use a single method for ranking all facilities in the region.

One region, for example, has not scored about 90, or 25 percent, of its estimated 361 facilities to determine how they should be ranked for corrective action under the EPI. These facilities generally had received RCRA assessments before the region began using Superfund assessments to implement the EPI in fiscal year 1989. Although the region needed to rank all facilities, it only ranked those facilities that had received Superfund assessments under the EPI. The region used the Superfund assessment's built-in method to evaluate and measure facilities—a score from 1 to 100 based on the environmental threat posed by a facility. In contrast, RCRA assessments do not have such a score. EPA headquarters suggested that regions could use the Superfund score to rank facilities with Superfund assessments, but did not give directions on how to score those facilities that had already received RCRA assessments.

In another region, all facilities were ranked, but three different methods were used, depending on the type of facility. Because each of the three methods is based on different criteria and scoring systems, facilities ranked under one method could not easily be compared with those ranked under another. As a result, this region could not prioritize the worst facilities among all types of facilities for corrective action. It did not use a systematic method for ranking operating treatment and storage facilities, for example, because these facilities will be addressed in time to meet the 1992 statutory permit deadline. Rather, the region informally ranked these facilities using state officials' knowledge of them.

EPA to Adopt Uniform Approach for Determining Environmental Significance

In July 1990, at the conclusion of our field work, EPA issued its RCRA Implementation Study, which corroborated our findings about the regional offices' lack of consistency in evaluating the environmental significance of facilities. To ensure that the regions and states are accurately identifying the environmental threat of facilities, the study recommended that EPA develop a uniform method for determining environmental significance.

In February 1991, EPA announced its plans to adopt a national approach for determining the environmental significance of facilities. Although many details remain to be worked out, EPA would establish national criteria for regions to use in determining their facilities' relative environmental threat. The criteria are (1) evidence of known or suspected releases of waste from the facility, (2) the potential for people or the environment to be exposed to the release, (3) waste characteristics, e.g., toxicity and volume, and (4) the migration potential or mobility of the released waste.

EPA is proposing that the ranking method currently in use by its Region 5 Chicago office be adopted nationwide, with modifications. The Region 5 method, a modified version of the Superfund hazard-ranking scoring system, results in each facility receiving a numerical score. Individual scores for facilities would then be grouped into categories of high, medium, and low priority.

Use of the nationwide approach based on the Region 5 method, however, is not mandatory. EPA is proposing to give its regions the option to continue using their existing ranking method(s), provided they can demonstrate that their method(s) will yield results that are equivalent to the national method.

National criteria and a systematic scoring system for determining environmental significance of facilities are essential for ensuring that EPA's limited resources are directed toward cleaning up those facilities posing the greatest threat—particularly considering that the number of facilities subject to corrective action continues to grow. Facilities are added as EPA identifies new hazardous wastes and as states find hazardous waste facilities that never entered the RCRA system. For example, EPA has promulgated or will issue new regulations that will add approximately 1,820 facilities to the RCRA universe within the next few years.

Although the proposed approach for determining environmental significance should minimize inconsistencies among regions in evaluating facilities, EPA will need to closely monitor the implementation of this approach to ensure, early on, that it is being consistently interpreted and applied. Early monitoring will allow EPA to refine or clarify criteria and guidance, if necessary, to ensure consistent application. During the EPI's initial implementation, we noted that EPA headquarters did not monitor the regions' implementation and therefore did not identify implementation weaknesses until February 1990, or 17 months after the program began. The development of new national criteria and guidance for the EPI could result in the regions' reworking their existing methods, to which they have already devoted substantial time and resources. It is therefore especially important that the past problems encountered in implementing the EPI not be repeated.

Competing RCRA Priority Impeded the EPI's Implementation

A competing RCRA priority, meeting the 1992 deadline for issuing permits to treatment and storage facilities, has impeded the EPI in meeting its goal of acting on the worst facilities first. Under the EPI concept, threat to human health and the environment—and not statutory permit deadlines—is the overall objective for determining which facilities should receive corrective action first. However, we found that some regions were addressing corrective action at operating treatment and storage facilities to meet the 1992 statutory permit deadline. As a result, facilities posing a greater environmental threat in these regions, such as closing land disposal facilities, may not have corrective action initiated until corrective action has been initiated at all operating treatment and storage facilities that need permits. This situation has occurred, in part, because EPA had not sent a clear signal to the regions regarding which priority—permits for operating treatment and storage facilities or corrective action at the worst facilities—should take precedence. For fiscal year 1992, EPA is planning to implement a new approach for its regions and the states to follow in setting priorities for permits and corrective action. The new approach will emphasize environmental results as the primary basis for deciding which facilities to act on first.

Permit Deadlines Have Driven Corrective Action in Some Regions

In implementing the EPI, EPA articulated two competing goals for regional corrective action programs: (1) to meet the 1992 statutory deadline for issuing permits to operating treatment and storage facilities and (2) to initiate corrective action at RCRA facilities posing the worst environmental threat. In some regions, however, regional resources for hazardous waste corrective action are not sufficient to meet both goals simultaneously.[3]

In implementing the EPI, EPA did not send a clear signal to the regions about which of the two goals should take precedence. Although the agency's guidance to regions emphasized the need to require corrective action at the most environmentally threatening facilities, its accountability system for carrying out this guidance—STARS—has not focused on this goal.[4] Consequently, the STARS targets often drive regional efforts, according to regional officials. Since fiscal year 1989, EPA's regional STARS targets have focused more on meeting statutory operating permit deadlines than on requiring corrective action at the worst environmental facilities.

As a result of these mixed signals, two of the four regions we reviewed were focusing their resources for corrective action on issuing permits to treatment and storage facilities in order to meet the 1992 deadline. In these regions, officials agreed that closing land disposal facilities generally pose a greater environmental threat than operating treatment and storage facilities. Nevertheless, the bulk of facilities receiving corrective action, according to regional officials, will be operating treatment and storage facilities until the 1992 treatment and storage deadline is met. In one of these regions, we found that under the EPI, the region had scored some closing land disposal facilities in the top third of all facilities ranked for environmental threat. However, these facilities had not been addressed for corrective action; instead some operating treatment and storage facilities that scored in the bottom third were being addressed for corrective action. The second region used three separate methods to prioritize facilities. Because these methods were not comparable, we could not determine whether the region's methods ranked land facilities as a higher environmental risk than treatment and storage facilities.

The two other regions that we reviewed, however, were attempting to address both goals simultaneously. They were taking this approach

[3]Hazardous Waste: Status and Resources of EPA's Corrective Action Program (GAO/RCED-90-144, Apr. 19, 1990).

[4]As discussed in ch. 2, STARS sets region-specific targets to accomplish the agency's goals.

because, in part, they believe closing land disposal facilities generally pose a greater threat than operating treatment and storage facilities. However, an official in one of these regions said that the STARS targets on issuing permits to operating treatment and storage facilities might force his staff to place a slightly higher emphasis on permitting these facilities.

EPA's RCRA Implementation Study acknowledges that the regions face competing goals. Specifically, the study points out that statutory deadlines for permitting have been a barrier to setting corrective action priorities for facilities with the most environmentally significant problems. According to the study, EPA must recognize that it will not be able to issue all permits (treatment and storage, and post-closure) and impose all corrective action requirements by the applicable statutory deadlines. The study recommended that several actions be taken, such as (1) establishing a framework for selecting actions at facilities on the basis of which will yield the greatest environmental results and (2) eliminating, through appropriate legislative change, the requirement to impose corrective action for facilities at the time of permit issuance. EPA concluded that it needed to advise the Congress that the statutory deadlines for issuing permits and addressing corrective action cannot be met, but that by developing and implementing a management system, the agency can address the most environmentally significant facilities first.

In February 1991, EPA published its draft fiscal year 1992 operating guidance. In the guidance, EPA outlined a new approach for its regions and states to follow in deciding which facilities to act on first for permits and corrective action. EPA is proposing that facilities' overall environmental priority be based on (1) environmental significance (especially keyed to the need for corrective action); (2) potential environmental benefits to be gained or risks avoided because of state or regional actions (primarily permitting-related activities); and (3) other considerations, such as a facility's enforcement/compliance history and financial status. EPA is proposing that these criteria—environmental significance, environmental benefits, and other considerations—taken together will represent facilities' overall environmental priority for receiving permits and corrective action. EPA is not, however, prescribing a specific approach for conducting the overall priority-setting process, nor is it defining how the scores for environmental significance, environmental benefits, or other considerations should be weighed relative to each other.

We agree with EPA that it has a problem of competing priorities. Without resolution of this problem, EPA regions will continue to receive mixed signals about which priority should take precedence. EPA's proposed system for determining facilities' priority for permits and corrective action on the basis of their environmental significance, environmental benefit, and other considerations is a step in the right direction. However, EPA's proposed approach may not go far enough in ensuring that priorities are set consistently for facilities across all regions. Specifically, EPA does not plan to define how the scores for environmental significance, environmental benefits, and other considerations are to be weighed relative to each other in making decisions about permitting and corrective action. Although we recognize that it may be desirable for regions and states to have some flexibility in reaching such decisions, we believe that for EPA to achieve consistent priority-setting for facilities across all regions, certain parameters may need to be established governing the relative weights to be accorded to these criteria.

Conclusions

EPA is depending on the EPI to ensure that its corrective action program is effective in a time of limited resources. The EPI's goal is to focus scarce resources on facilities posing the worst environmental threat. However, as the EPI has been implemented, EPA has had limited assurance that the regions' various methods were adequate for determining environmental threat. Each region used different criteria to evaluate facilities and assigned different weights to the criteria used. Consequently, each region developed its own definition of environmental threat so that facilities defined as the worst in one region may not have been considered the worst facilities in another. Further, a competing RCRA priority—to meet a statutory operating permit deadline—has caused some regions to begin corrective action at facilities requiring permits rather than at those posing the worst environmental threat.

EPA has acknowledged these problems and has recommended actions to address them. EPA's proposed actions, if properly implemented, should help ensure that EPA is focusing its limited resources on addressing facilities with the greatest environmental threat. But it is not yet clear whether its proposed actions will go far enough in ensuring consistent priority-setting for facilities across all regions.

However, EPA will need to closely monitor the implementation of these proposed actions to ensure, early on, that they are being consistently interpreted and applied throughout its regions and the states. We are particularly concerned about whether consistency can be achieved given

EPA's decision not to define how its proposed criteria of environmental significance, environmental benefits, and other considerations are to be weighed relative to each other in deciding which facilities should receive priority for permits and corrective action.

Also, because placing more emphasis on environmental factors will likely result in EPA's not meeting its 1992 statutory deadline for issuing permits to the remaining treatment and storage facilities, EPA, as it recognizes, needs to advise the Congress of this delay and the reasons for it. As it also recognizes, EPA will need to seek legislative authorization from the Congress to enable it to eliminate the requirement to impose corrective action at the time of permit issuance.

An effective EPI program is important not only because of EPA's limited resources but also because the number of hazardous waste facilities continues to grow. Facilities are added as EPA identifies new hazardous wastes and as states identify hazardous facilities that never entered the RCRA system. EPA has promulgated or will issue new regulations that may add a projected 1,820 more hazardous waste facilities to the total number in a few years. Therefore, the regions will continue to need a systematic method to rank these new facilities.

Recommendations

To ensure that its new approach—for evaluating the environmental threat posed by facilities and for deciding which facilities to act on first for permits and corrective action—achieves its intended goals, we recommend that EPA closely monitor the regions' and states' implementation of the new approach to ensure consistent interpretation and application. As part of its monitoring, we recommend that EPA assess the need for further guidance to define how the criteria of environmental significance, environmental benefits, and other considerations are to be weighed relative to each other in establishing the overall priority for which facilities should receive permits and corrective action.

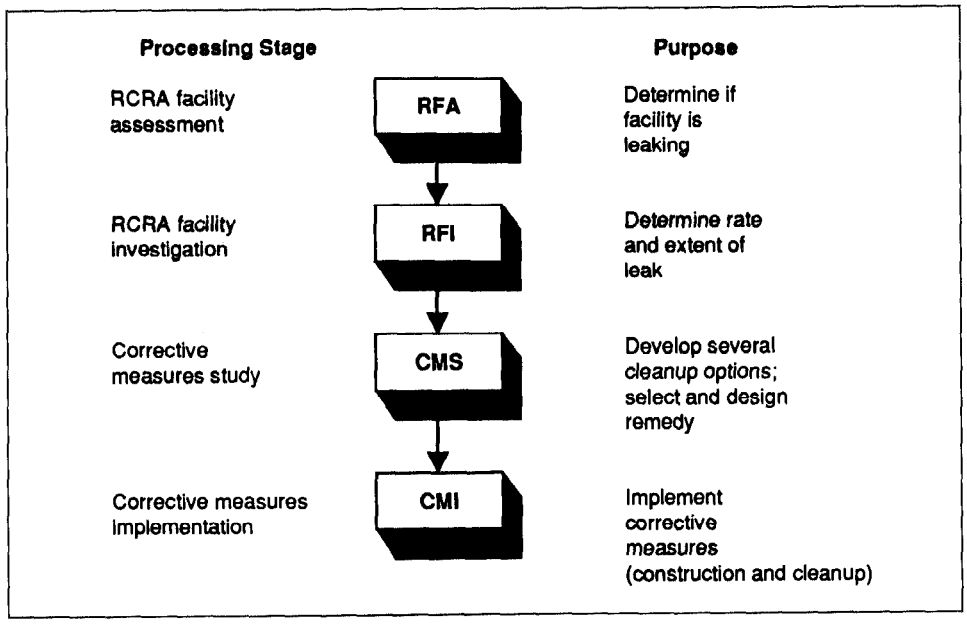
Status of EPA's Efforts to Assess and Clean Up Contamination at Closing Facilities

As of February 1991, the Environmental Protection Agency (EPA) had assessed 794, or about 35 percent, of the 2,282 closing facilities to determine if they are contaminating the environment. Of the 794 facilities assessed, EPA had determined that 717, or about 90 percent, show sufficient evidence of a release or potential release of hazardous waste to warrant further investigation to confirm the release and/or characterize its extent. As of February 1991, detailed investigations had been imposed at 302 of these 717 facilities. Of the 302 facilities, 75 have proposed, selected, or implemented cleanup remedies.

Corrective Action Program

EPA has established a corrective action program to ensure that facilities clean up their leaking waste management units. EPA is responsible for approving each stage of the cleanup process and for monitoring cleanup activities. As illustrated in figure I.1, identifying contamination at facilities and implementing corrective action generally follows a four-stage process—the RCRA facility assessment (RFA), the RCRA facility investigation (RFI), the corrective measures study (CMS), and the corrective measures implementation (CMI). Where facilities pose an immediate threat to human health or the environment, however, EPA may require facility owner/operators, through the permit or an enforcement order, to take interim corrective measures without waiting for the final results of the corrective measures study.

Figure I.1: RCRA Corrective Action Process



Note: Interim measures can occur at any point in the corrective action process.

EPA performs the RFA to identify actual and potential releases from all waste management units at the facility. The RFA includes, among other things, a review of available file information, a site inspection, and, often, soil and water sampling. This assessment determines whether there is sufficient evidence of contamination to require the facility owner/operator to undertake more detailed investigations.

If EPA determines that it has sufficient evidence of a release of hazardous waste or chemicals, the facility owner/operator must conduct an RFI to characterize the nature and extent of the contamination. For closing facilities, EPA requires an RFI either through (1) the post-closure permit process or (2) an enforcement order. The first approach is generally used at land disposal facilities closing with waste in place. These facilities require post-closure care and monitoring. The second approach is used to impose RFIs at those closing land disposal facilities that are not due to receive post-closure permits in the immediate future or at other closing facilities, such as treatment and storage facilities, which are generally expected to clean-close and thus do not require post-closure care. The owner/operator is responsible for conducting the RFI; EPA is responsible for overseeing the work through reviews of workplans and reports, and site inspections.

Once the RFI is completed, EPA determines whether corrective measures are needed. If so, the owner/operator is required to complete a CMS to develop several cleanup remedies. EPA oversees the work performed during the CMS and ultimately selects the remedy that best addresses corrective action at the facility.

During the CMI, the owner/operator implements the selected remedy. EPA requires the owner/operator to design, construct, operate, maintain, and monitor the corrective measures. Again, EPA is responsible for overseeing the work conducted by the owner/operator to ensure that work is completed as planned.

Progress in Assessing Closing Facilities

Table I.1 shows that of the 2,282 closing facilities, about one-third have had RFAs completed to determine if their waste management units are leaking. Most of the closing facilities that have been assessed for potential contamination are land disposal facilities.

Table I.1: Closing Facilities With RFAs Completed

Type of facility	Number closing	RFA completed	Percent of total
Land disposal	1,128	716	63
Incinerator	39	13	33
Treatment/storage	1,115	65	6
Total	**2,282**	**794**	35

Evidence of Contamination at Facilities Assessed

Of the 794 facilities with completed RFAs, 717, or 90 percent, have waste management units that show evidence of potential releases of hazardous waste and require further investigation through an RFI. Table I.2 shows the assessed facilities that are suspected of having caused contamination.

Table I.2: Closing Facilities Suspected of Contamination

Type of facility	RFA completed	RFI needed	Percent of total
Land disposal	716	653	91
Incinerator	13	8	62
Treatment/storage	65	56	86
Total	**794**	**717**	90

Progress in Cleaning Up Closing Facilities

Although evidence of leakage, or potential leakage, is evident at the majority of facilities that have completed RFAs, EPA has imposed an RFI at only about 40 percent of these facilities to determine the rate and extent of contamination present. Table I.3 shows RFIs imposed for facilities that need further investigation.

Table I.3: RFIs Imposed at Closing Facilities That Need Further Investigation

Type of facility	RFI needed	RFI imposed	Percent of total
Land disposal	653	285	44
Incinerator	8	1	13
Treatment/storage	56	16	29
Total	**717**	**302**	42

Table I.4 shows the status of corrective action at facilities where an RFI has been imposed. Most facilities are still in the RFI stage, while some are in the CMS or CMI stage. Only five facilities have completed cleanup.

Table I.4: Status of Corrective Action at Closing Facilities

Type of facility	RFI imposed	RFI stage	CMS stage	CMI stage
Land disposal	285	216	54	11
Incinerator	1		1	
Treatment/storage	16	11	3	1
Total	**302**	**227**	**58**	**12**

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