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The Nation's Hazardous Waste Management Program at a Crossroads

The RCRA
Implementation Study

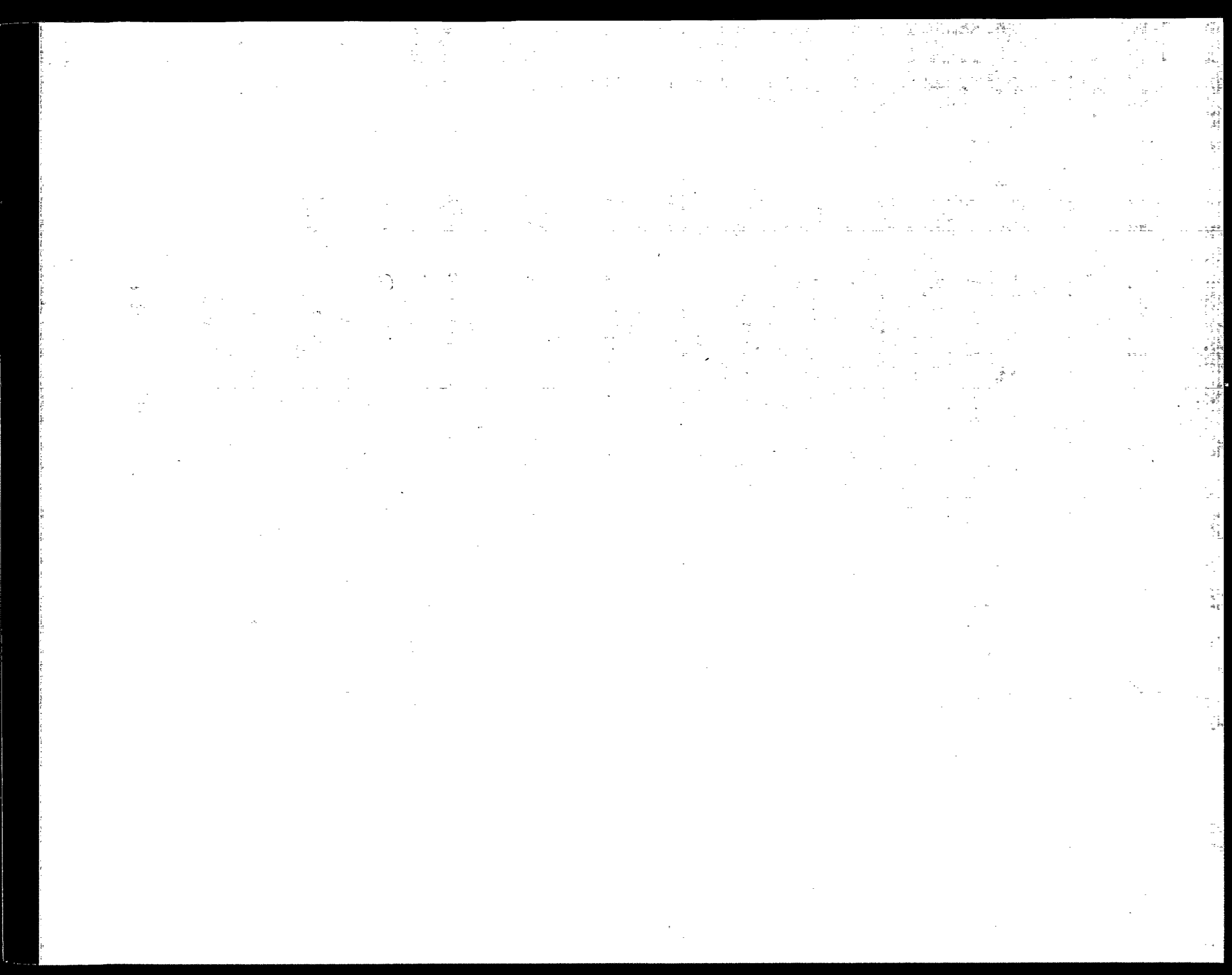


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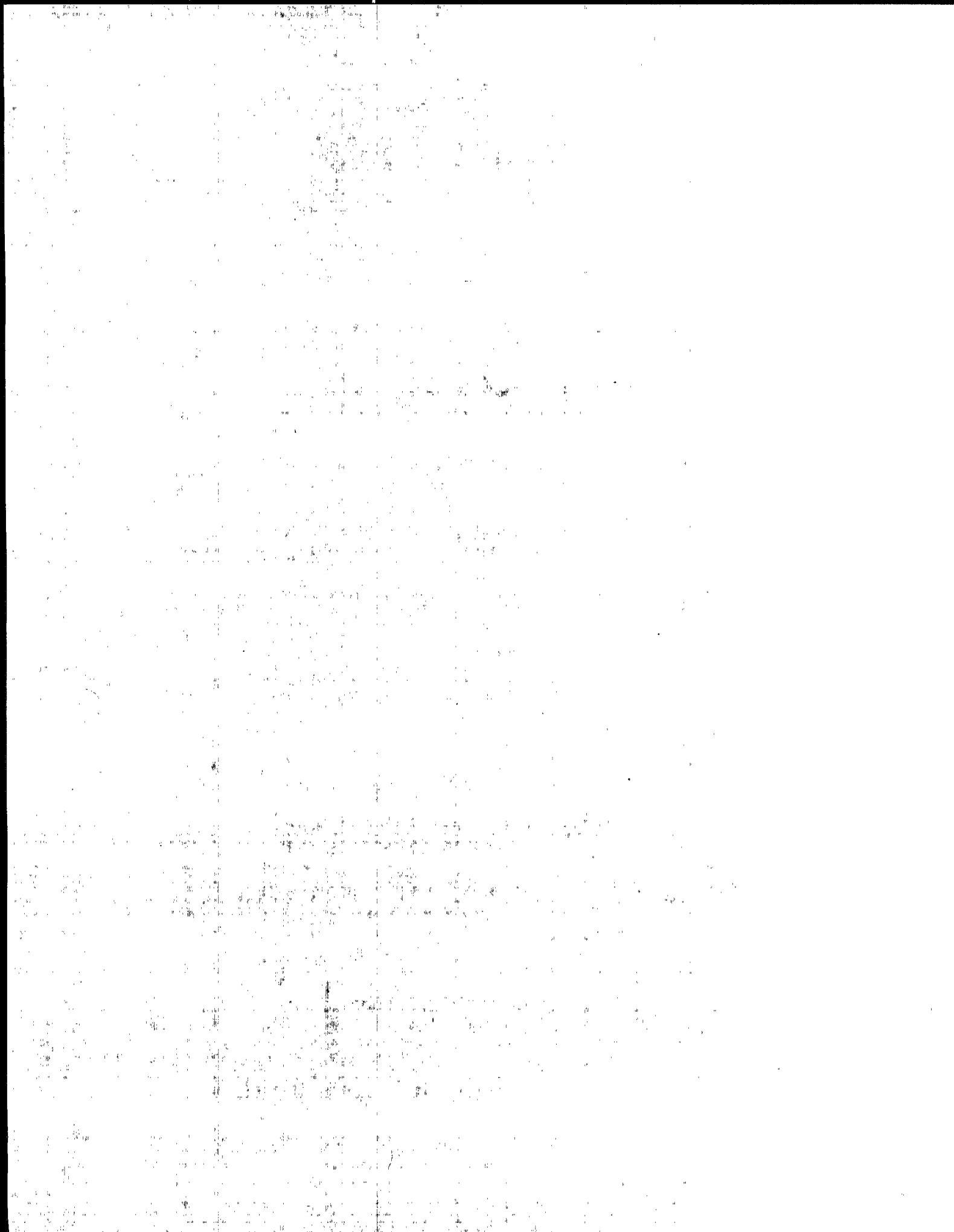


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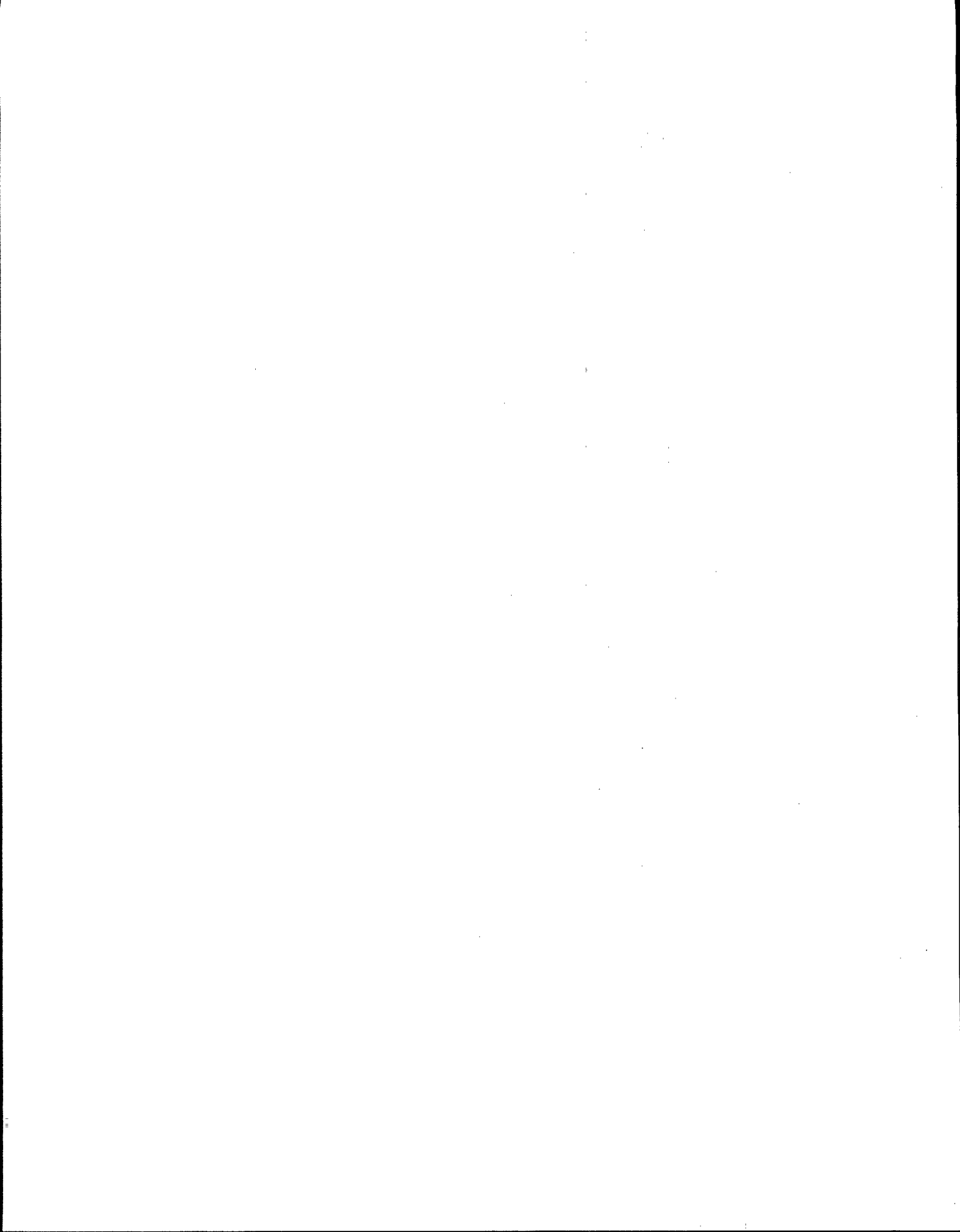
This study represents the collective efforts of a substantial portion of the national community interested in, involved in, and affected by the Resource Conservation and Recovery Act (RCRA) hazardous waste program. An Executive Committee, chaired by Christian Holmes, Allyn Davis, and Bill Muszynski, established seven subcommittees to investigate the areas identified as critical to the RCRA Subtitle C program: evolution, the state/federal relationship, regulation development, permitting, compliance and enforcement, corrective action (cleanup), and program resources. In addition, two focus groups examined the roles and needs of information management and science and technology in the Subtitle C program.

Comprised of personnel from EPA headquarters, EPA regional, and state offices, these subcommittees conducted over two hundred interviews and evaluated EPA data bases, surveys, articles, and reports issued by Congress, the General Accounting Office, and the Office of the Inspector General. This report draws on a wide-ranging and dynamic spectrum of individuals from all sectors affected by the program—environmental groups, industry, Congressional staff, and current and past state, regional, and headquarters staff. The entire effort was undertaken, written, produced, and endorsed by state, regional, and headquarters personnel. This unified effort to investigate, evaluate, and recommend action is unprecedented in the RCRA program.

I thank all who participated in developing this study. Their hard work and commitment are responsible for the RCRA program's impressive record of success to date, and will continue to be the program's most valuable asset. I will continue to look to the participants in this study for further guidance and creative assistance as I seek to improve and build upon the foundation the RCRA program has established.



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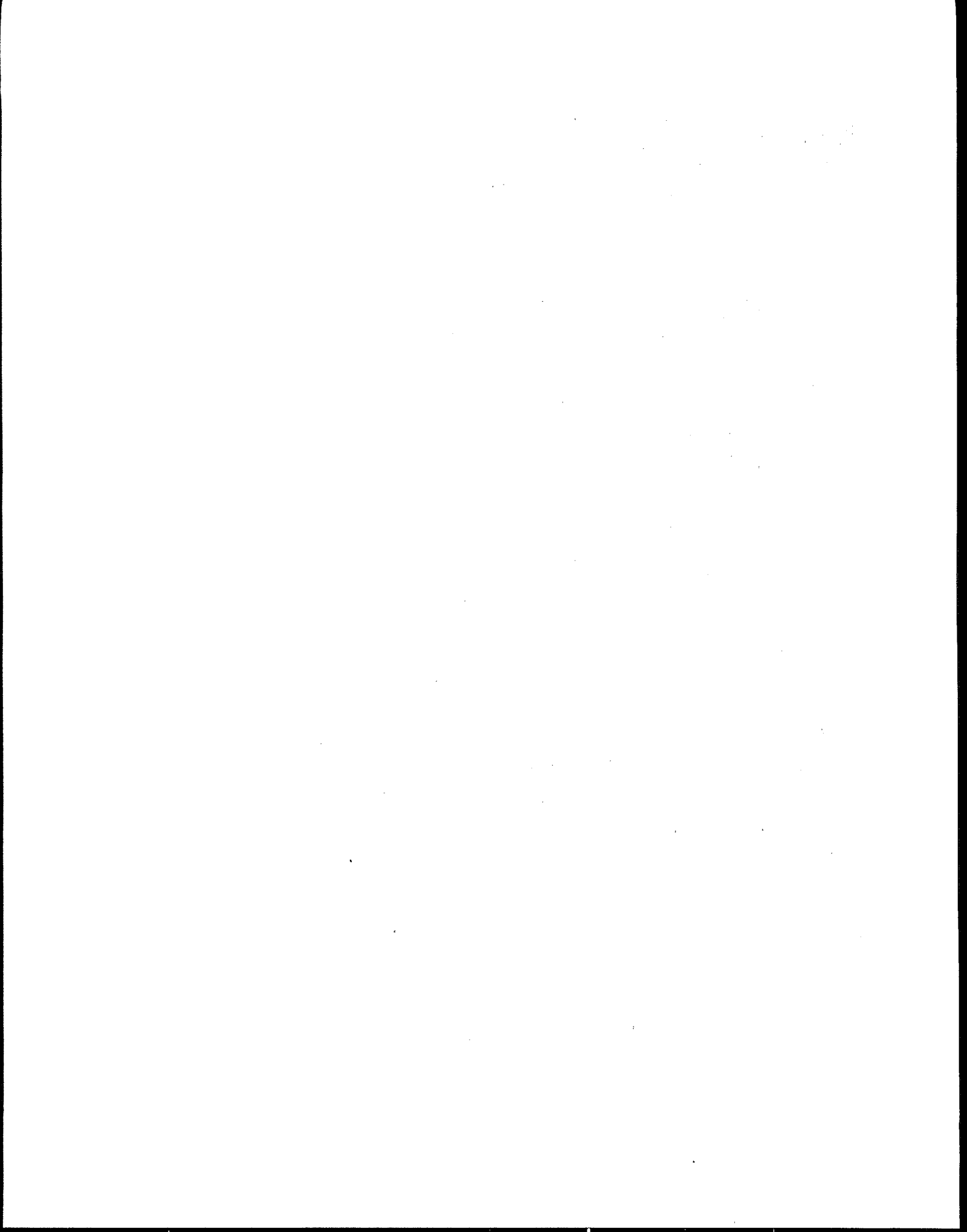
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CHAPTER 1

RCRA at a Crossroads: A Direction for the Future

In the last decade, the Resource Conservation and Recovery Act (RCRA) has revolutionized the management of hazardous waste. Its impact on the nation and on protecting human health and the environment has been undeniable. The program's comprehensive national regulatory structure has made significant strides in ensuring compliance with the law. Yet, since RCRA was enacted in 1976, no single analysis has evaluated the progress of RCRA's hazardous waste program and the key issues affecting the program as it enters the 1990s. Therefore, during his confirmation hearings before the Senate Environment and Public Works Committee, Assistant Administrator Don R. Clay committed the Office of Solid Waste and Emergency Response to a comprehensive review of the implementation of the hazardous waste provisions of RCRA.

This RCRA Implementation Study provides a landmark opportunity to ensure that our nation achieves the greatest reduction in risks to human health and the environment, relative to the enormous resources we are investing in the hazardous waste program. The entire program has sprung up in a very short period, reacting to Congressional deadlines and public pressures. EPA now believes it is time to be proactive, rather than reactive, in fashioning a plan for managing hazardous waste in the future. What improvements are necessary to make RCRA more rational? How can we provide clear incentives for the regulated community to prevent pollution? How can we simplify and streamline this complex regulatory structure?

EPA sets forth in this study for the first time its philosophy for the management of hazardous waste in the coming decade, together with the detailed rationale underlying that philosophy. Based on extensive analysis of perspectives gained from federal and state officials, public interest representatives, and the regulated community, this study sets the direction for implementing RCRA and provides the basis for the EPA's strategic decision making over the next decade.

The chapters that follow contain a wealth of ideas for refining and building upon the foundation established by RCRA to date. Of course, EPA cannot implement all of these recommendations at once. Rather, we view this study as a "living document," and specifically invite all interested parties to assist us in identifying the changes most critical to the program right now. Our follow-up strategy will be refined by that input, as well as tempered by budget realities, in the course of its implementation. Nonetheless, we are excited by the challenges posed in making our philosophy a reality, and welcome the opportunity to work with the large community of persons interested in, and affected by, the RCRA program.

Principal Findings

The following general findings provide the basis for RCRA's direction for the future:

- *The RCRA Subtitle C program has established a sweeping framework for the management of hazardous waste in this country, and has made tremendous progress in reducing both short- and long-term risks.*
- *Priorities need to be clarified across a broad range of activities. RCRA is plagued by too many "high" priorities, many of which are conflicting or unrealistic.*
- *Human resources need invigorating. The RCRA work force is talented and committed, but needs more training, support, and incentives to be maintained.*
- *Waste minimization efforts need emphasis to promote the "conservation and recovery" in RCRA.*
- *The roles of involved parties are unclear, including EPA headquarters and regional offices, states, the Office of Management and Budget, the courts, Congress, and the public.*

- *We need better measures for judging the program's performance and for setting realistic goals.*
- *We need to steer the program in a direction that will encourage innovation in hazardous waste management and cleanup.*
- *Communication needs improvement between EPA and external groups, as well as within EPA.*

Direction for the Future

As discussed in more detail in each individual chapter of this study, EPA's direction for RCRA's future has the following core elements:

Establishing and Communicating Clear Priorities

The most difficult part of developing an action plan is setting clear priorities based on both the environmental benefits to be gained and the risks they will reduce, avoid, or eliminate. EPA will proactively communicate these priorities to groups within the RCRA program (headquarters, the regions, and the states) and external groups (Congress, the public, and the regulated community), highlighting the need for flexibility as well as the trade-offs the program must make to achieve them. To the extent available data permit, EPA must set program goals and allocate resources based on environmental benefit—that is, risk reduced or avoided from specific actions. Where EPA's priorities conflict with Congressional and court mandates, EPA will consult with interested and affected parties to discuss their concerns and enlist their support.

Balancing Prevention and Cleanup Efforts

We must maintain a strong presence at treatment, storage, and disposal facilities to ensure that they continue to manage waste properly and prevent releases. Within the next six months, EPA will set priorities for: (1) maintaining safe capacity for wastes through the issuance of operating permits; and (2) ensuring that waste management facilities that close do so properly and are issued post-closure permits for continued monitoring of the facility after closure. The corrective action (cleanup) needs of both operating and closing facilities are substantial, and must be considered in setting priorities.

We will begin an action plan that, over the next eight years, will evaluate the universe of RCRA facilities subject to corrective action, halt the movement of contamination at those facilities, develop and implement national criteria for setting priorities among facilities, and develop performance standards for their successful cleanup.

We will also investigate legislative changes that would allow "de-coupling" corrective action from the permitting process. This action would help us deal first with facilities that present the greatest risks and then address less hazardous situations. To implement this strategy, EPA will need flexibility in meeting the 1992 statutorily mandated deadline for issuing permits to treatment and storage facilities.

EPA will clearly specify what is expected of facilities when they conduct corrective action. Firms that have a positive environmental and compliance record can then start cleanup activities and control problems early, with some confidence that they are doing what would be required of them under an order or a permit. Similarly, EPA will develop performance standards against which industry can target its cleanup goals.

Developing Clear and Concise Regulations

To create more comprehensible regulations and potentially reduce the costs of compliance for the regulated community, EPA will begin evaluating major regulations within a reasonable time frame after their promulgation. Current and future regulations need to be reviewed for their ease of implementation, enforceability, and environmental impact. This process will include soliciting feedback from regions, the states, industry, and the public.

EPA will start by clarifying the definitions of "solid waste" and "hazardous waste," so that facilities clearly understand they are subject to RCRA's requirements, and regulators can determine the size of the RCRA universe. Both short-term fixes to clarify and reformat the current definitions as well as long-term statutory changes, will be considered.

Revisiting regulations, however, must be balanced with developing new rules. The current work group process for regulatory development must be improved. Toward this end, EPA will clearly define the roles of work group members, encourage coordination with other program offices, and promote the participation of both the regions and the states.

Emphasizing Waste Minimization

EPA's rules and permits have had great success in reducing the volume of mismanaged hazardous waste. However, continuing to focus on "end-of-pipe" solutions will not solve our nation's hazardous waste problems. The ultimate battle will be won by the facilities that actually produce the waste in the first place.

Thus, EPA will explore ways to create economic incentives that will unleash entrepreneurial ingenuity in developing waste minimization and recycling techniques. We will emphasize waste minimization in our day-to-day program operations. We will incorporate it in enforcement actions—for example, by using settlements creatively to foster waste minimization and by emphasizing it during compliance activities.

Supporting Compliance and Enforcement Activities

The RCRA program has issued more rules in a shorter time than any other environmental program. This trend will continue in the next few years as EPA continues to meet RCRA's statutory deadlines. The number and complexity of these requirements have severely taxed the ability of the regulators and the regulated community to keep up with and respond to them. The challenge today is to provide the tools needed by both to ensure that new rules are fully understood, fully complied with, and soundly implemented.

Thus, EPA will undertake more targeted enforcement initiatives. For example, while continuing to emphasize treatment, storage, and disposal facilities, EPA will target compliance by hazardous waste generators and identify hazardous waste handlers who have not notified EPA of their activities.

To enhance our deterrence efforts, EPA will strive to seek higher judicial and administrative penalties and strengthen criminal enforcement. In addition, we will ensure that EPA regional RCRA programs have sufficient support in the Office of Regional Counsel.

Speeding Up State Authorization

The states have traditionally been the principal implementors of the hazardous waste program. Their ability and willingness to carry out the program is critical to its success, especially in view of the enormous challenges of the corrective action

program. We must better define the role of EPA and the states. We have been operating under the assumption that the states and EPA were partners, while the roles more closely resembled those of client and contractor.

To streamline the process of authorizing states to implement the corrective action program, EPA will transfer authorization responsibility from headquarters to the regional offices. We will also investigate the commissioning of states, partial and conditional authorization, and limited self-certification when considering statutory changes.

Attracting, Retaining, and Developing Staff

Continued achievement of RCRA's environmental goals turns on the ability of EPA and the states to maintain a highly skilled and motivated work force. The program's future success will be defined by the quality of the public servants responsible for its implementation. Federal and state personnel have been severely taxed by the workload of recent years. In order to more effectively meet program needs, EPA will investigate ways to move extramural contract resources to the intramural work year appropriation and state grants.

Currently, little time is available for the personal growth, training, and technical development that is crucial as RCRA confronts challenges on the cutting edge of technology, science, and the law. As a first step in its effort to attract and retain talented and committed staff, EPA will establish a centralized training program for federal and state personnel. EPA will also ensure that RCRA program positions achieve parity with similar positions in the Superfund program.

Developing More and Better Environmental Data

Although the body of hazardous waste data is considerably better today than in the past, we still need more information about the regulated universe, the amount and nature of waste generated, the science of ground water, and the real and potential risks at RCRA facilities. In contrast to the air and surface water programs, where monitoring has been in place over two decades, a sizable body of ground-water monitoring data is only now becoming available.

The RCRA program can improve its information if it implements a process that involves

headquarters, the regions, the states, and the regulated community. We must define what the RCRA program wants to measure by developing environmentally based goals and objectives. Using these milestones, we must develop an information management plan that serves as the blueprint for collecting information and for developing necessary systems. The plan must recognize the complexity and cost of information, and must be flexible enough to respond to changing needs. We must assemble and analyze the data so that we know where the greatest environmental risks from hazardous waste occur, and can measure the program's success in terms of risks reduced or avoided, rather than the number of activities undertaken (permits issued, inspections performed, etc.).

Accelerating Scientific and Technological Development

For each advance made in dealing with complex waste management and ground-water protection, EPA has uncovered new questions. The science and technology associated with waste minimization and cleanup are still at a relatively primitive stage. The challenge for EPA is to rapidly accelerate the scientific and technological knowledge base, which will speed up prevention and cleanup at thousands of sites.

We will apply the knowledge gained in the Superfund program to RCRA sites, and not duplicate the research already undertaken by the Superfund program. In addition, we will conduct the technology development component of RCRA within the same office that oversees the development of innovative technologies for Superfund.

Communicating More Effectively

The need to communicate earlier, more often, and better applies to communications with groups inside the RCRA regulatory program (headquarters,

regions, and states) as well as to external groups (Congress, the public, the regulated community). EPA needs to communicate its vision, plans, and priorities, as well as its successes and failures, to all of these groups.

The Challenge Ahead

The chapters that follow contain the specifics of EPA's direction for the future of RCRA, and form the foundation for our decision making in the area of hazardous waste management into the 1990s. These chapters represent the collective efforts of hundreds of experts and interested parties in many fields of endeavor, and contain many excellent ideas too numerous to mention in this brief overview. Of course, the RCRA program cannot, and should not, absorb all of these changes at once. Rather, our goal is to use this study as a tool for guiding, in close cooperation with the Congress, our nation's strategic decision making in the area of hazardous waste management through the upcoming budget cycles, operating plans, and individual program management decisions. The Congress has played a critical role in shaping the nation's hazardous waste management program, and future successes will depend on close cooperation between Congress and the Executive Branch.

The challenges are great. However, RCRA has achieved an impressive record in establishing a national hazardous waste management scheme in a very few years. The potential ahead to refine, improve, and build upon that record is enormous, and EPA welcomes the opportunity to work with the RCRA hazardous waste community to achieve our goals.



CHAPTER 2

The Road Just Travelled: A Chronicle of the RCRA Subtitle C Program

The Program's Legislative History

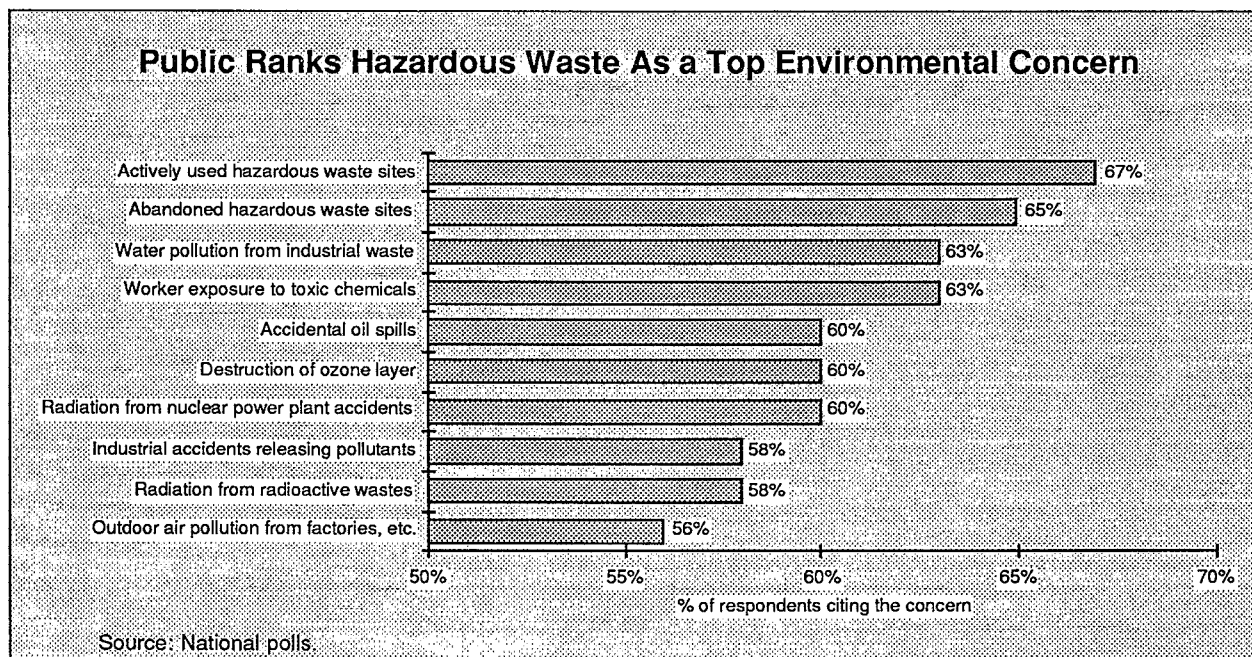
In 1965, Congress passed the Solid Waste Disposal Act. This was the first federal law that required environmentally sound methods for disposal of household, municipal, commercial, and industrial refuse. Congress then amended the law in 1970 by passing the Resource Recovery Act.

As the complexity and breadth of the waste management problem grew, the federal government saw a clear need for a more comprehensive program geared toward *preventing* significant contamination problems from occurring in the future. To address these needs, Congress amended the law again in 1976 by enacting the Resource Conservation and Recovery Act (RCRA). RCRA laid out a basic framework for regulating waste generators, waste transporters, and waste management facilities.

In the late 1970s, EPA focused on the regulation of municipal (nonhazardous) wastes. Around the same time, however, more and more information was surfacing about the health and environmental impacts of hazardous wastes. Studies showed extensive and continuing contamination of ground water, inadequate training or funding for many state waste management programs, and far more technical complexity than originally thought in the area of ground-water protection. The highly publicized disasters at Love Canal and other toxic waste sites highlighted that existing methods of hazardous waste disposal, particularly land disposal, were not safe. Acting through environmental groups, the news media, and elected officials, the public expressed a clear preference for reducing and, where possible, eliminating all risks from hazardous waste (see Figure 1).

As a result, Congress revised RCRA, first in 1980 and again in 1984, under the title of the

FIGURE 1



Hazardous and Solid Waste Amendments (HSWA).^{*} With these revisions, EPA had in place three comprehensive waste management programs: the Subtitle C program, which establishes a system for controlling *hazardous waste* from its generation until its ultimate disposal; the Subtitle D program, which establishes a system for controlling *solid (primarily nonhazardous) waste*, such as household waste; and the Subtitle I program, which regulates *toxic substances and petroleum products stored in underground tanks*.

The Early RCRA Program

The early years of the RCRA program were characterized by the development of the base RCRA regulations, reliance on performance-based rules, and slow program implementation.

Development of the Base RCRA Regulations

Because RCRA was a new program, little environmental data were available on waste generation, the nature of the hazards posed by the wastes, or the likelihood for adverse human or environmental exposures from those wastes. In fact, during the early 1980s, the technical and scientific tools needed to gather baseline environmental data were largely unavailable, and the analytic methods for testing complex waste matrices were just emerging. And, unlike its history in the air and water programs, EPA had no regulatory experience in hazardous waste management—there had been no federal program to address hazards from wastes generated as part of the production process. As a result, the regulatory program was slow to get started.

In May 1980, EPA promulgated regulations covering the identification and listing of hazardous wastes; standards for generators and transporters of hazardous wastes; permitting procedures; interim standards for hazardous waste treatment, storage, and disposal facilities; and requirements and procedures for state authorization. Then in 1982, EPA promulgated technical standards and financial responsibility requirements for treatment, storage, and disposal facilities, and permitting standards for land disposal facilities. Together, these regulations formed the “base” regulatory program.

Reliance on Performance-Based Rules

Lack of data contributed to two fundamental policy choices. First, EPA chose to bring under the hazardous waste management system: (1) wastes that contained more than a specified level of hazardous constituents; (2) wastes that exhibited a hazardous characteristic (e.g., ignitibility); and (3) specific waste streams from particular industries, as data on them became available. This allowed EPA to identify a broad spectrum of wastes for regulation without a great deal of empirical information.

Second, in designing the standards that would apply to the facilities managing hazardous wastes, EPA developed general performance-based requirements that would be effective until site-specific permits were issued to facilities. Complying with performance-based standards required meeting generic criteria specific to types of facilities (e.g., the same general requirements applied to all disposal facilities). Facilities complying with these requirements were regarded as “interim-status” facilities until they received site-specific permits.

Slow Program Implementation

Federal implementation of the base program was slow during the early 1980s as EPA looked to the states to take the lead on program implementation. EPA and Congress envisioned that a successful national hazardous waste management program would be put in place only through joint action between the federal and state governments. Thus, assuming that the states would soon be issuing the more stringent and comprehensive site-specific permits, EPA focused on authorizing states to implement the base program. By the end of 1984, forty-two states had received interim authorization to implement the base program. However, in focusing its energy on authorizing states, EPA was slow to develop and promulgate other important rules.

The Paperwork Reduction Act of 1980 and Executive Order 12291, issued in 1981, reflected a government-wide emphasis on reducing industry's paperwork burden and cost associated with complying with federal regulations. The Executive Order authorized the Office of Management and Budget to review proposed or final regulations for these purposes. Because of the regulatory climate, RCRA rulemaking continued only slowly, and EPA

revised, suspended, or deferred a number of requirements (e.g., ban on liquids in landfills, requirements for ground-water monitoring). As a result of the controversy surrounding the management of the Superfund program, waste management program issues also became a source of considerable friction with Congress. All of these factors led Congress to distrust EPA's commitment to the effective implementation of the hazardous waste program.

Reauthorization of RCRA: A Pivotal Year

When RCRA was due for reauthorization in 1984, Congress wanted to prevent future Superfund sites, but lacked confidence in EPA's ability to develop an effective prevention program. Congress was also strongly influenced by environmental groups demanding a detailed and comprehensive statute for the control of hazardous wastes. At the same time, the Administration did not offer its own bill for RCRA reauthorization, which prevented EPA from proposing its vision for the RCRA program as HSWA was being debated.

HSWA's passage into law in November 1984 began a new phase for the Subtitle C program. HSWA was extremely detailed and comprehensive, and it fundamentally altered the RCRA program and EPA's management of it. Through HSWA, Congress became the driving force behind the program.

HSWA Greatly Expanded the Regulated Universe

To strengthen the nation's shield against hazardous wastes, HSWA established over 70 statutory requirements (often with very tight deadlines) for EPA's action. They can generally be summarized as follows:

- Move away from land disposal as the primary means of hazardous waste management by requiring treatment of wastes before their final disposal.
- Reduce the environmental and health risks posed by hazardous waste still managed at land disposal facilities by establishing minimum technology requirements.
- Close down facilities that cannot safely manage wastes.
- Decrease and clean up releases to the environment from waste management units by requiring facilities to take corrective action.
- Issue permits for all treatment, storage, and disposal facilities within prescribed time frames.
- Close the loopholes in the types of wastes and waste management facilities not covered under RCRA.
- Expand the universe of regulated sources by including generators of small quantities of hazardous wastes.
- Minimize the amounts of wastes being produced.

With this comprehensive sweep of hazardous waste issues, HSWA greatly expanded the magnitude of waste types and waste management facilities requiring regulation. Today the RCRA regulated universe consists of 4,700 hazardous waste treatment, storage, and disposal facilities. Within these facilities are approximately 81,000 waste management units, most of which are units that have received hazardous waste and from which contamination may have spread to the soil and ground water. In addition to these 4,700 facilities are 211,000 facilities that generate hazardous waste.

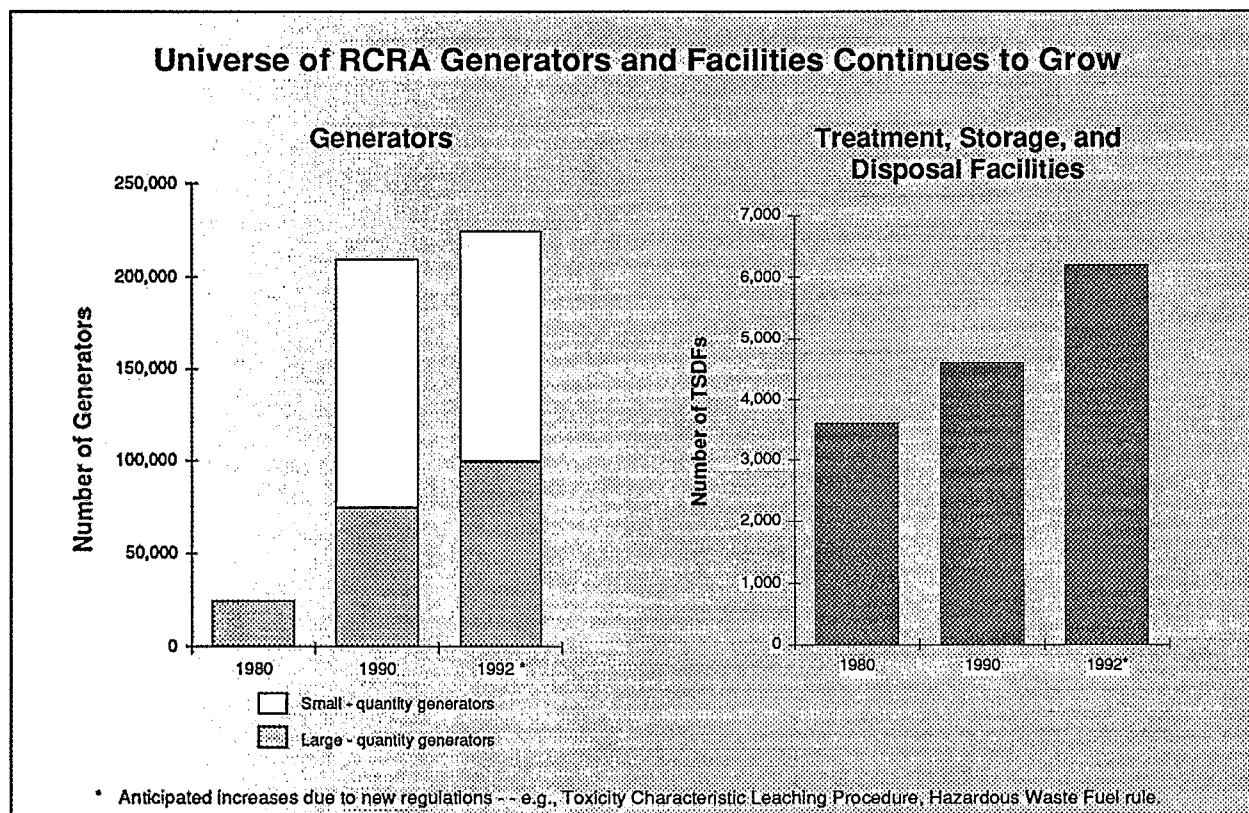
As Figure 2 illustrates, the number of generators covered by RCRA requirements has increased almost nine-fold over the last ten years, with the largest increase resulting from EPA's regulation of small-quantity generators in 1985. This regulation alone increased the RCRA universe by an estimated 118,000 handlers. Similarly, the universe of treatment, storage, and disposal facilities requiring a permit and/or a closure plan also increased by approximately 1,000 from 1980 to 1990.

HSWA Modified EPA's Role As an Administrative Agency

The traditional role of an administrative agency is to use technical and scientific expertise to best apply the public policies embodied in law and to manage the implementation of those policies. HSWA's specificity fundamentally altered EPA's role in both.

The HSWA statute often defined the technical standards for waste management (e.g., the number and types of landfill liners required at waste disposal facilities). In addition, Congress prescribed

FIGURE 2



schedules for issuing permits, specified the frequency of inspections at waste management facilities, and specified new program requirements, including a corrective action program to clean up contamination at facilities. To ensure that EPA issued new regulations quickly, Congress included statutory deadlines with "hammer provisions" for certain regulations. Most notably, the hammer provisions would have prohibited the land disposal of hazardous wastes, unless EPA issued regulations that sharply restricted what could be disposed of in land-based waste management units by a specified date.

Close Congressional Oversight Limited Flexibility

Although HSWA was extremely prescriptive, EPA retained considerable discretion in some regulatory and policy matters. However, attempts to exercise this discretion were sometimes influenced by unusually close Congressional oversight of the hazardous waste programs—seemingly closer than that of other environmental

programs. This resulted in Congress setting EPA's agenda and scheduling specific implementation deadlines for the hazardous waste program.

For example, through the 1985 Congressional hearings on ground-water monitoring requirements, Congress made it clear that EPA was to be held accountable for state performance. This meant that EPA had to closely oversee the states' programs and be intimately familiar with what was happening with individual facilities in the states. In addition, HSWA required that its implementing regulations become effective in all states upon promulgation, which means that EPA has to implement those regulations until the states become authorized to do so. The net effect was to shift control of much of the RCRA program from the states back to EPA.

As another example, EPA had already begun developing risk-based treatment standards before HSWA's passage and continued to promote a risk-based approach after HSWA. Through hearings and written comments on the proposed rule,

Congress made clear its desire for technology-based standards. As a result, EPA reversed its decision and issued technology-based treatment standards.

Courts Also Quickened Implementation

Traditionally, the courts have deferred to EPA on policy issues, allowing EPA to use its own judgment when it has statutory discretion. However, like Congress, the courts have played a strong role in determining the pace of the program's implementation.

Earlier in the history of the program, the courts had sympathized with the immensity of EPA's task for implementing HSWA. However, they later became less tolerant of EPA's pace. As a result, several successful lawsuits brought by environmental groups have kept EPA to tight time schedules for promulgating regulations and implementing the program.

Trade-Offs of Meeting Deadlines

While issuing congressionally mandated regulations and permits at a record pace accomplished a great deal to protect the environment, adhering to the very demanding regulatory development schedule has prevented EPA from attending to other very important priorities.

Program Evaluation and Long-Term Priorities Have Been Lacking

In responding to the priorities set by Congress in HSWA, EPA has been unable to evaluate the program's progress, develop long-term priorities to address waste handlers based on environmental risk, or ensure the most effective use of available resources to address the worst sites first.

Training Has Taken a Back Seat

EPA has been unable to focus on solidly establishing the components fundamental to successfully implementing regulations, such as training personnel. Almost six years after HSWA's passage, it is still true that little time is available to the average regional or state employee to understand each new rule, how it fits into the overall program, and how to best manage its implementation to achieve optimum environmental benefit.

Old Regulations Have Not Been Revised

The flood of new regulations, the new requirements layered on pre-existing regulations, and the inability to revisit existing regulations to understand how well the new and old requirements will work together have caused great confusion and frustration among regulators and the regulated community. In keeping up with the regulatory schedule, EPA has not had the time to review promulgated rules for implementability, enforceability, or clarity.

New Regulations Have Made It Difficult for State Programs

EPA regional staff have been forced to shift into a production and implementation mode, largely foregoing their role in overseeing state programs, helping the states develop their programs, and evaluating programs. And the states have been required to constantly revise their programs to be consistent with the federal program when new rules have been published.

Environmental Data Have Not Been Pursued

By devoting its energy and resources to regulatory production and implementation, EPA has been unable to focus on gathering and developing data that would help identify which problems pose the greatest risks to health and the environment and how those risks can best be reduced, avoided, or eliminated.

State Authorization Has Slowed Down

Since HSWA's passage, EPA has been far more concerned with meeting statutory deadlines than with authorizing states. As a result, the fast pace that EPA achieved during its authorization of states for the base regulatory program has dramatically slowed down.

Options Have Not Been Examined

In the rush to meet statutory deadlines for issuing regulations, little time has been devoted to discussing regulatory alternatives, either within EPA, or with states, industry, environmental groups, or the public.

Potential Cross-Media Conflicts Have Needed Attention

The program has not had the time to examine potential regulatory overlaps or inconsistencies with other environmental programs. This type of analysis is inherently difficult, given the different statutory frameworks for the environmental programs. Nevertheless, it may be important if one of the unintentional effects of the RCRA regulations was to encourage a shift of pollution from the land to the air or water.

An Opportunity for Choice

Public and Congressional expectations have historically been beyond the reach of the RCRA

program's capacity. That capacity will continue to be severely taxed as a result of the time and resources required if EPA continues to successfully meet Congressional deadlines (see Appendix A).

In 1993 the total number of treatment, storage, and disposal facilities will most likely exceed 6,000—a 30 percent increase over 1990. And while many other facilities may never be regulated under Subtitle C, they will—and do—require the time and attention of RCRA personnel both in EPA and in the states. These facilities fall into the “special waste” or “industrial waste” category, and include the vast amounts of wastes generated by the mining industry.

EPA now has an opportunity to choose a direction for the program and set its own priorities, rather than continuing in a reactive mode, driven

RCRA ACCOMPLISHMENTS

The hazardous waste program has made tremendous progress in a few short years. The following list highlights program accomplishments in the areas of regulatory development and implementation.

Statutory and Regulatory Accomplishments

Established “cradle-to-grave” tracking of hazardous waste.

Established design and performance standards for landfills and treatment technologies.

Developed a comprehensive regulatory system and issued required regulations, such as the small-quantity generator regulations, the land disposal restrictions, the Toxicity Characteristic Leaching Procedure rule, and the draft corrective action rule.

Caused the closure of a large number of mismanaged facilities; two-thirds of non-compliant land disposal facilities closed.

Prevented the disposal of untreated wastes into and onto the land.

Implementation Accomplishments

Permitted more than 900 hazardous waste management facilities.

Assessed over 1,600 facilities to determine if there were releases from solid waste management units.

Established an enforcement presence in the field, including a strong criminal enforcement program.

Authorized 46 states for the base RCRA program.

Increased industry emphasis on waste minimization.

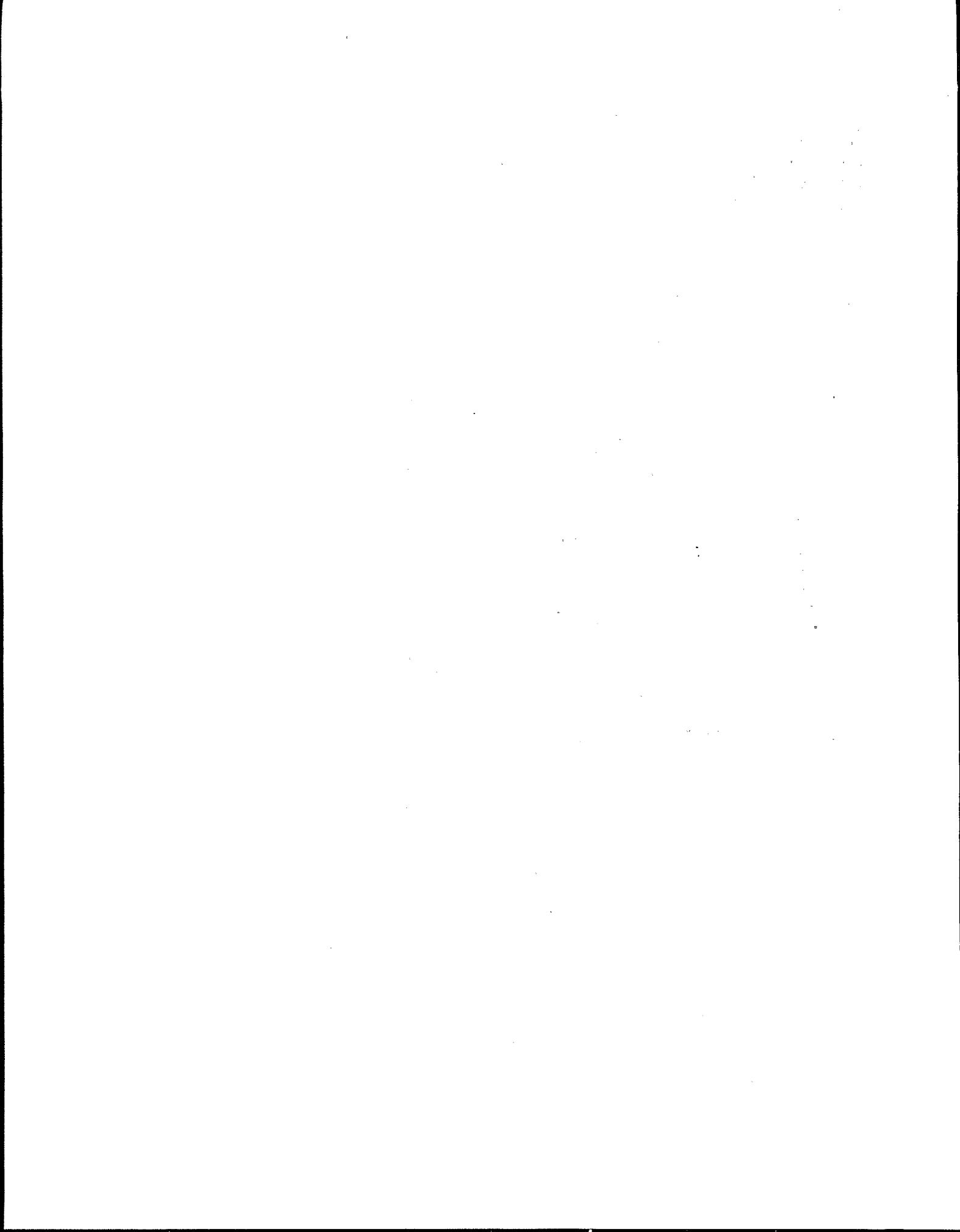
Greatly improved waste management, treatment, storage, and disposal practices through compliance with interim-status standards and facility-specific permit requirements.

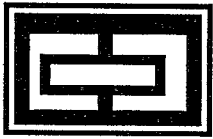
Ensured advances in the science of ground-water monitoring by developing standard monitoring methods and protocols with the American Society of Testing and Materials.

by public perceptions and expectations and by Congressional deadlines. EPA has better relations with Congress now than it did in 1984, and a proven track record in being responsive to Congress by meeting most of the HSWA deadlines. Senior EPA managers can greatly influence the program by communicating their priorities internally and externally and by working with Congress as RCRA/HSWA reauthorization is debated. If EPA does not attempt to set an agenda for the hazardous waste

program, it can expect Congress to do so through more legislative hammer provisions. As history demonstrates, EPA could then remain in a reactive position indefinitely, at considerable cost to program managers, staff, and the regulated community.

The following chapters identify, discuss, and offer recommendations to improve the short- and long-term implementation, enforcement, and evaluation of the RCRA program.





CHAPTER 3

Federal/State Alliance: A Working Relationship

Introduction

In 1976, both EPA and Congress envisioned that a successful national hazardous waste management program would be put in place only through joint state and federal action. The statute made clear that Congress intended the states to assume primary implementation of the program. However, the statute also reserved some specific program implementation responsibilities for the federal government.

"Authorization" is the mechanism by which EPA passes the program to the states. EPA reviews a state's hazardous waste management program and, if it is acceptable, "authorizes" the state to run its program in lieu of the federal government's.

The state/federal relationship has followed a cyclical pattern. In the early developmental stages of the program, the relationship between EPA and the states was flexible. However, this situation changed dramatically with the advent of the 1984 Hazardous and Solid Waste Amendments (HSWA). EPA's focus on meeting HSWA's prescriptive mandates and deadlines led to reduced flexibility in its relationship with the states.

This reactive tendency was furthered by the 1985 Congressional hearings on the compliance of

hazardous waste management facilities with ground-water monitoring requirements. These widely publicized hearings dramatically changed the nature of the oversight process. At these hearings, EPA regional and headquarters program managers were rigorously questioned about individual sites in authorized states, and EPA was criticized heavily for not being intimately familiar with every detail of what was happening at each of those sites. As a result of this painful experience, EPA began to demand extremely detailed site information from authorized states, and the era of micro-management in RCRA began.

This intense scrutiny of site-specific information, together with the impact of HSWA (whereby EPA regulations became immediately effective even in authorized states), has seriously eroded the working relationship between EPA and the states. Only in the last couple of years has the overall relationship begun to improve somewhat.

A better understanding of the state/federal relationship can be gained by examining it in the context of the elements of relationships in general. Relationships are characterized by a number of different elements that, when considered together, define the nature of the relationship (see Table 1). "Ownership" in the relationship and mutual trust are the outgrowths of the other elements. The

TABLE 1

Several Elements Determine the Nature of a Relationship					
Client/Contractor		Elements		Partnership	
Directed; need not be shared	←→	Goals and priorities	←→	Jointly developed; must be shared	
Spelled out	←→	Expectations	←→	Understood	
Spelled out	←→	Roles	←→	Understood	
Formal, less frequent	←→	Communication	←→	Informal, frequent	
Unequal	←→	Control	←→	Shared	
Formal, spelled out	←→	Processes	←→	Informal, understood	

current relationship between most states and the EPA regions actually falls somewhere between client/contractor and partnership.

By examining our observations about these elements, we will attempt to define the nature of the state/federal relationship in implementing the RCRA program. It is important to note that EPA and the states are working together now and are achieving significant environmental results. Further, some EPA/state relationships are very good. However, as in any relationship, there is room for improvement. The focus of this chapter is on the friction points in the relationship that need improvement — particularly those that are within EPA's control — as well as on how that friction is manifested in the authorization process.

Findings and Recommendations

Areas of friction among headquarters, the regions, and the states include the nature of EPA's relationship with the states, priorities and planning, expectations, definition of roles, communication, and the authorization process. Figure 3 illustrates the frequency with which various issues were cited as friction points by state, regional, and headquarters personnel interviewed for this study.

Nature of the EPA/State Relationship

The perception of an unequal partnership, the need for clear ownership of the program, and the emphasis on federal accountability for program activities are all major sources of friction in the EPA/state relationship.

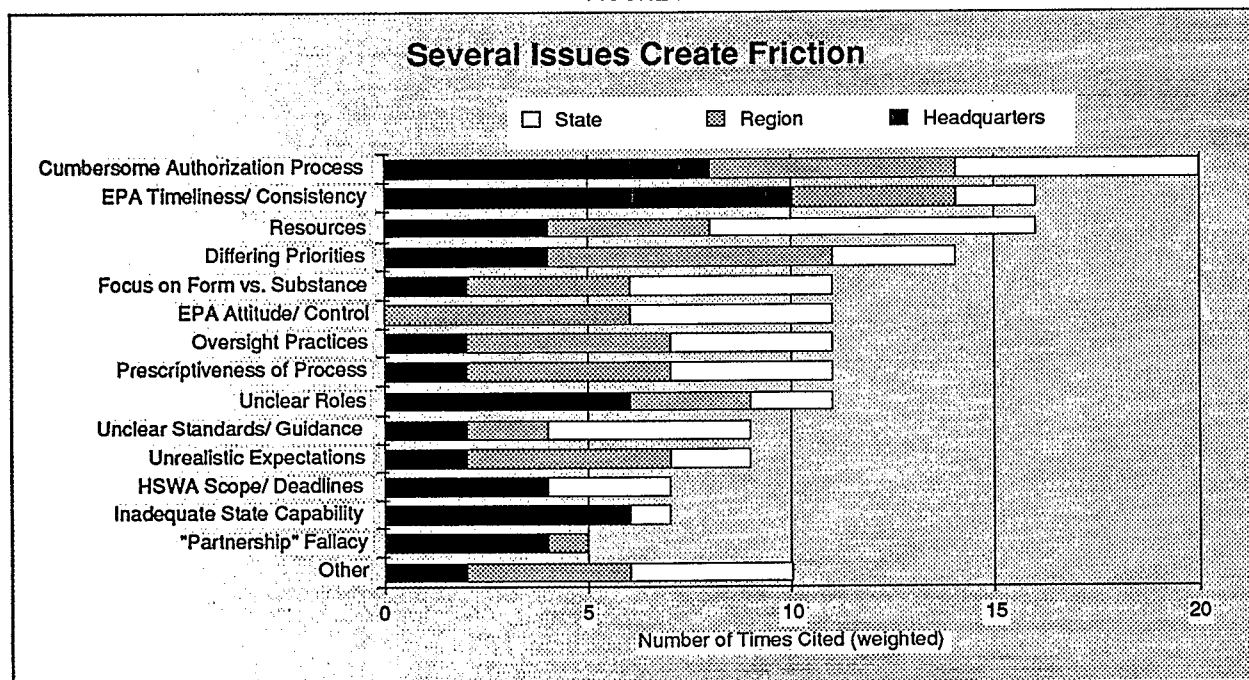
"Partnership" or Working Relationship?

FINDING: The EPA/state relationship suffers from not living up to the promise of a "partnership."

DISCUSSION: The relationship between EPA and the states authorized to implement RCRA is often referred to as a "partnership." However, many people take issue with this term, with some characterizing the current relationship as "parent/child," and others as "contractor/client." Few agree it meets their personal definition of an equal partnership. Continued use of the word "partnership" to describe the state/federal relationship is at best misleading and, at worst, the cause of unnecessary friction.

RECOMMENDATIONS: Acknowledge that although the actual relationship between EPA and the states has some elements of a partnership, it also has elements of a client/contractor arrangement. Thus,

FIGURE 3



the term "working relationship" should be substituted for "partnership."

Who Owns the Program?

FINDING: Program ownership and resources are major friction points in the state/federal relationship. States feel excluded from planning and setting priorities, but are then expected to buy into the ever-increasing costs of program implementation.

DISCUSSION: Funding and program ownership are closely related. While most respondents feel that the federal and state governments should share program costs, many states believe that federal mandates should be supported with federal funds. However, some EPA regional offices think that the states must provide whatever additional funds are needed to operate an "ideal" program. As the growing workload for the RCRA program has surpassed available resources, the sense of frustration and level of friction between the states and EPA have grown (see Figure 3), particularly since the states feel that EPA decision making has failed to fully consider the states' costs of implementing the program. One interviewee summed up these concerns by observing, "States are angry because they are paying more than their share, while having no impact on [EPA] headquarters' concepts and rulemaking; instead states' comments are ignored."

RECOMMENDATION: Calculate the federal and state resources needed to effectively implement each new regulation, and, to the extent possible, base decisions requiring activities on budgeted resources.

States See Federal Control As Excessive

FINDING: There is general agreement that Congress and the public will always hold EPA accountable, so EPA needs to exercise some control over state implementation of RCRA. However, the amount of control needed and how it should be exercised are matters of considerable disagreement.

DISCUSSION: Many states view EPA's concern over its accountability to Congress, and its subsequent reaction to this concern, as responsible for EPA's exercising increased control over the states. The 1985 Congressional hearings led headquarters to believe that it must be able to quickly respond in detail to Congressional inquiries on individual facilities. That idea is still prevalent today. The new management information system, RCRIS, was specifically designed to allow

headquarters and the regions direct access to detailed site information compiled and entered by the states. This intense scrutiny of site-specific information has seriously eroded the state/EPA working relationship by appearing to shift control of the relationship to EPA.

Priorities and Planning

The states and EPA generally have a common understanding of the top four priorities for the RCRA program, as specified in the Agency Operating Guidance. However, those interviewed have different views about what the program's top four priorities *should* be (see Figure 4). For example, the states and the regions indicated that waste minimization should be one of the RCRA program's top priorities, yet none of the headquarters respondents included it. State authorization also figured prominently as a priority, ranking third on the list of preferred priorities.

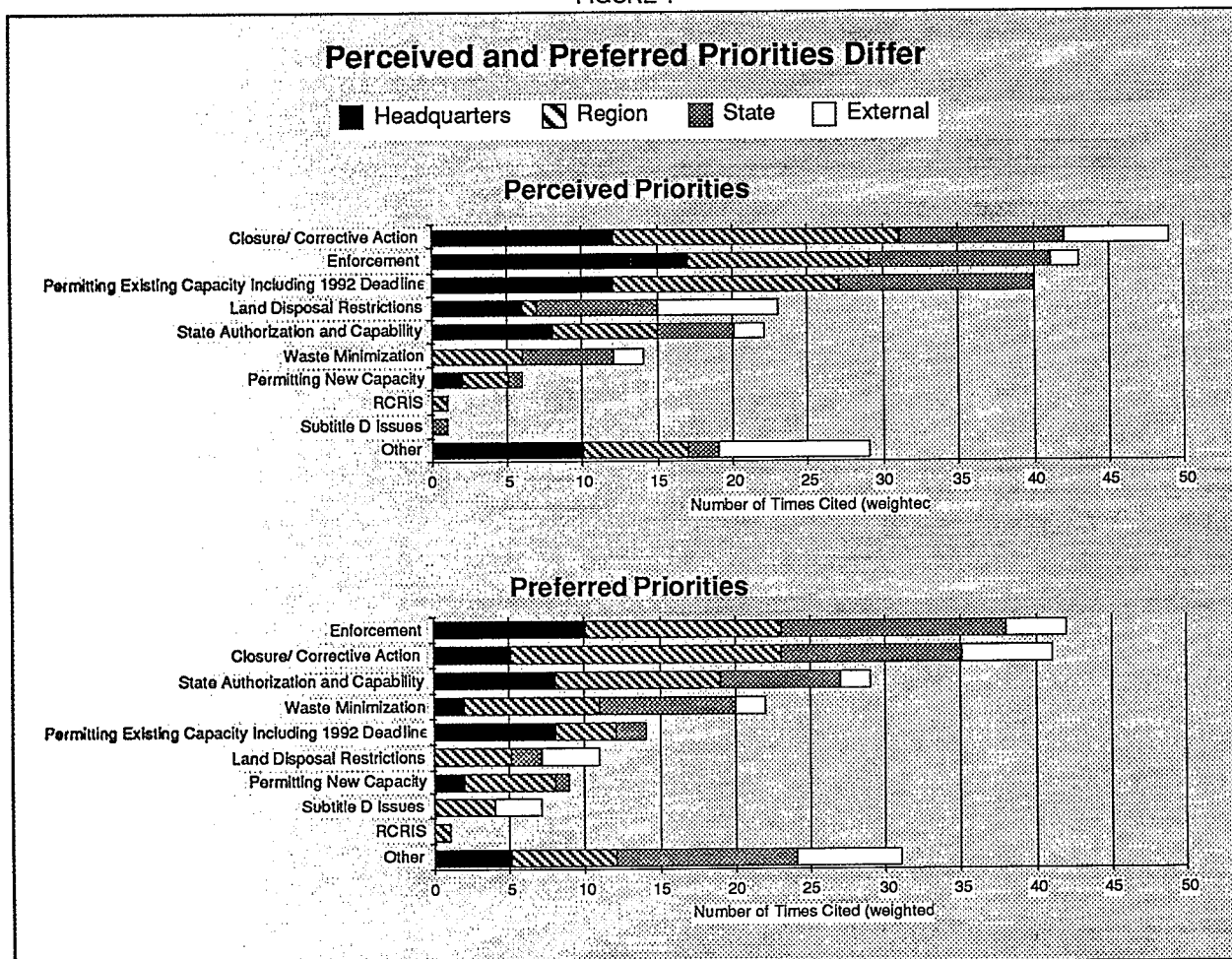
The discrepancies between what the priorities are and what the parties feel they should be are indicative of shortcomings in the current priority-setting and planning processes. Unlike a true partnership, in which goals and priorities are jointly developed and shared, EPA's current planning and priority-setting processes are often viewed as reactive rather than proactive, lacking a common focus, and unilaterally developed without input from the states.

External Influences Have Been Setting EPA's Goals and Priorities

FINDING: EPA and the states believe they have limited ability to influence national planning and priority setting. This is due to the fact that EPA is not sufficiently proactive with Congress, resulting in strong Congressional impact on planning and goal-setting.

DISCUSSION: Most of the states and regions believe that goals and priorities are not jointly developed, but rather are imposed from the top down. Many headquarters personnel, including those at high levels in the organization, also feel that their ability to affect the process is minimal. Many initiatives are undertaken as a result of external influences, such as public and Congressional expectations, lawsuits, and General Accounting Office reports. Examples cited include the permit deadlines established in HSWA and Congressional interest in the enforcement of the ground-water monitoring requirements.

FIGURE 4



EPA did not take a proactive role with Congress in setting goals for the program largely because of the direction Congress took with HSWA in 1984. HSWA's prescriptive approach changed EPA's traditional role in proactively setting its priorities. Through HSWA, Congress imposed specific tasks for EPA to accomplish and deadlines to meet. Rather than attempting to establish its own plan for implementing the new requirements and its own definition of success, EPA made a conscious decision to go forward with the Congressional definition. To date, EPA has made no strong move to resume a proactive role in setting RCRA's program goals.

RECOMMENDATIONS:

- Become more proactive in setting the direction and schedule for the development and implementation of the RCRA program.

- Target available resources to specific objectives and tasks to ensure that national goals are achieved.
- Actively communicate EPA's agenda to Congress, environmental groups, and the public.

Common Goals and Priorities Are Needed

FINDING: Different entities within EPA do not appear to share a common focus regarding the RCRA program's goals and priorities.

DISCUSSION: Several EPA headquarters personnel responded narrowly to questions concerning national goals and priorities, focusing specifically on individual areas of expertise. Similarly, Congressional staff and environmental groups also appear to focus narrowly on specific areas, rather

than on the broader results of program implementation. However, the states and regional offices responsible for field implementation of the program seem to share common priorities to a greater extent and are more aware of the interaction between program elements.

There is evidence that RCRA national goals and priorities are not well integrated across EPA offices responsible for joint program support. In particular, the operations of the Office of Solid Waste (OSW), the Office of Waste Programs Enforcement (OWPE), the Office of Enforcement (OE), and the Office of General Counsel (OGC) are not well integrated. This lack of integration is best illustrated in the development of the Agency Operating Guidance, where each office (except OGC) provides input on the priorities within its area. Rarely is one office willing to sacrifice one of its priorities for a priority of another office. Consequently, all offices' activities are included, but no hierarchy is developed. Thus, all activities appear to be equally important. Since the total list of activities may exceed available resources, the regions and states, who must try to implement everything, pay the price for this lack of integration.

The problem is exacerbated when the states or regions attempt to trade off, through "RIP-flex," certain activities for other tasks they believe are of greater environmental significance. The difference of opinion among the headquarters offices caused by the proposed trade-off can only be resolved at the highest levels within EPA. For this reason, headquarters is often viewed as unable to grasp "the big picture."

Ultimately, failure to integrate joint goals and priorities across EPA offices sends mixed messages to the regions and states and generates conflict and disagreement. As discussed later in this chapter, these problems are further magnified in the authorization process.

RECOMMENDATIONS:

- Agree internally on shared goals, and then implement them consistently. All appropriate EPA offices should know and understand RCRA's program priorities and the interaction among program elements.
- Articulate the decision-making process, particularly with regard to competing priorities, and ensure that it is understood by everyone.

Goals and Priorities Should Allow for Specific State Needs

FINDING: Program objectives and tasks are developed with little flexibility to address state-specific environmental needs.

DISCUSSION: Although EPA has recently begun to examine ways to provide some flexibility for the regions and the states to pursue activities they think are environmentally significant, there are rarely enough resources to address all the identified national priorities. Thus, important state-specific initiatives go unfunded. The states and regions frequently mention waste minimization as an area needing more attention, but one that is currently not afforded resources or specific measures. Many comment that while there should be a defined "minimum" program that forms the basis for determining national consistency, flexibility is also needed in the tasks designed to implement that basic program.

As an example of needed task flexibility, respondents cite the need to target inspections differently from the Agency Operating Guidance in order to address local environmental problems. "RIP-flex" is the present mechanism by which a state or region may deviate from national priorities. Although the regions and states recognize this mechanism as being a step in the right direction, those who have attempted to "Rip-flex" note that the process needs to be revamped and expanded. It was also noted that the standards for flexing are not clear to all parties.

Some states indicate that their relationship with EPA has improved recently because of the region's willingness to recognize resource limitations. In some cases, more flexibility has been introduced into the grant negotiation process. Detailed discussions with one state and its regional office (see the case study in Appendix B) revealed that the relationship began to improve significantly after the state shared information on its entire program (including state-funded activities) with the region. The region gained a better understanding of the state's priorities and constraints, and was willing to be more supportive and flexible in negotiating the annual grant. The state and the region have established a process whereby they can agree to joint priorities. As a result, the relationship now operates more smoothly.

RECOMMENDATIONS:

- Identify the "core" program requirements, and use this concept in making decisions on flexibility.
- Clearly define and communicate requirements for deviating from national program priorities to pursue state-specific environmental initiatives.

Expectations

The unrealistically high level of expectations placed upon the hazardous waste management program is a major source of friction between the states and the regions (see Figure 3).

Unrealistic Expectations Have Undesirable Impacts

FINDING: EPA is fearful of admitting to the full workload of HSWA.

DISCUSSION: Trust is a critical component of a good working relationship. Yet the states and many regions feel that EPA headquarters is not honest in stating what can be accomplished in the program, and is not willing to admit to its limitations. Three of the myths that are institutionalized in this manner are that: (1) EPA and the states can issue high-quality permits to all facilities within strict statutory time limits; (2) the program can meet strict inspection mandates and can take all necessary follow-up enforcement actions within rigorously established time frames; and (3) the scope of the program can be greatly expanded without affecting the quality of the base (pre-HSWA) program. The result is that unrealistically high levels of accomplishments are targeted and then imposed upon the states through the authorization process and the annual grant cycle. Many states commit to what they know to be unachievable levels of activity in order to receive authorization and/or funding, and then are unable to complete all of the activities.

RECOMMENDATIONS:

- Use the strategic planning process to develop long-term, integrated, and realistic schedules for regulatory development.
- Work with the states to establish goals and objectives that consider, to the extent possible, environmental results and available resources.
- Make clearly identifiable choices among

competing priorities, and make these choices explicit in the Agency Operating Guidance and in the program's strategic plan through a tiered priority system.

Measuring Program Progress Is Difficult

FINDING: EPA has failed to define what constitutes success for the RCRA program. Consequently, performance is judged against an unrealistic standard of perfection, and it is difficult — if not impossible — to measure the program's true progress.

DISCUSSION: External groups have frequently defined success for the RCRA program in unrealistic or unachievable terms. The result has been increased pressure on the states to fund and implement the "perfect program." This imposition of unrealistic expectations has often caused the states to resent EPA, and the regional offices to resent headquarters. Both the states and EPA are judged as failing because they cannot live up to the expectations. In fact, EPA has institutionalized a system in which the states and EPA itself will always fall short. External groups tend to focus on these shortcomings and, rather than being credited for their accomplishments, state and EPA employees are criticized for not having done the impossible.

RECOMMENDATIONS:

- Jointly define with the states what constitutes success in the RCRA program, and fully communicate the definition among each other, the public, and the regulated community.
- Actively communicate the RCRA program's accomplishments, such as the significant improvements it has brought about in how hazardous waste is managed in the nation.

Roles

The extent to which roles are clearly defined and understood significantly affects the effectiveness of a working relationship. Although the appropriate roles for EPA and the states appear to be well understood conceptually, it is evident that all parties experience much difficulty in applying the concepts to actual program implementation and oversight. When asked to describe the *current* roles played by EPA headquarters, the regions, and the states, the respondents had varying answers that contrasted

sharply with the descriptions of the *appropriate* roles (see Table 2). In characterizing current roles, respondents cited difficulties stemming from EPA's lack of commitment to program delegation, overinvolvement in state programs, and inadequate communication among parties.

EPA's Roles As Doer and Overseer Are Unclear

FINDING: Many people doubt EPA's professed full commitment to complete program implementation by the states, particularly in the area of corrective action. It is widely held that "EPA's actions belie its words."

DISCUSSION: At the heart of this issue is EPA's reluctance to give up its "doer" role once it becomes appropriate to transition to an overseer role. EPA is cited as remaining deeply involved in site-specific, day-to-day decision making, and is often accused of nit-picking and second-guessing state decisions, even in authorized states.

Due to the continuous changes that take place in both the RCRA regulations and the authorization status of individual states, EPA must be a "doer" in some situations and an "overseer" in others, and sometimes both. For example, as regulatory and authorization status changes, EPA and a state may both have responsibility for permitting and enforcement at a single site. This results in confusion and frustration for the regulated community and for environmental groups who must work with two separate entities on the same issue.

In some cases, where the regions and the states have been able to agree on each party's role in advance, implementation has been smoother and more effective. Several states and regions point to the Joint Permitting Agreements as an example of a role well defined from the start.

EPA's commitment to delegating corrective action to the states is particularly unclear. The burgeoning corrective action workload requires fully leveraging both state and EPA resources. However, EPA is sending mixed signals as to whether the states should be authorized for corrective action. Some regions are strongly encouraging states to develop their capability and become authorized, while others are taking the opposite tack. As of May 1990, six states have either interim or final authorization to operate corrective action programs (see Figure 5).

RECOMMENDATIONS:

- In general, EPA should:
 - Clarify its position on full implementation of the RCRA program by the states, particularly for corrective action.
 - Clarify the RCRA implementation roles for headquarters, the regions, and the states in the areas of: permitting, compliance monitoring and enforcement, state authorization, training, technical assistance, and oversight.
 - Implement the existing EPA Oversight Policy, emphasize EPA's transition from a doer to an overseer, and establish the necessary management infrastructure to ensure that the policy is implemented. EPA's overseer role should focus on building the capability of states to operate their own programs, and EPA regions should be evaluated by how effectively they help the states succeed.
- In the area of corrective action, EPA should:
 - Adopt and *fully* commit itself to achieving the goal of authorizing all states for corrective action.
 - Facilitate authorization for states that are willing and able to assume responsibility for corrective action activities.
 - Actively encourage and help build state capability in states that are not now able to assume corrective action responsibilities.
 - Shift some resources from EPA's oversight of individual facilities to development of state corrective action programs.

Perceptions Differ on EPA's Oversight Role

FINDING: EPA's current exercise of its oversight role is viewed as excessive, intrusive, and characterized by unnecessary reporting requirements.

DISCUSSION: While overseer is seen as EPA's appropriate role, current oversight practices nonetheless cause significant friction between EPA headquarters and the regions, and between EPA regions and the states. The regions feel they are not subject to appropriate oversight by headquarters, and the states feel the same about EPA regions.

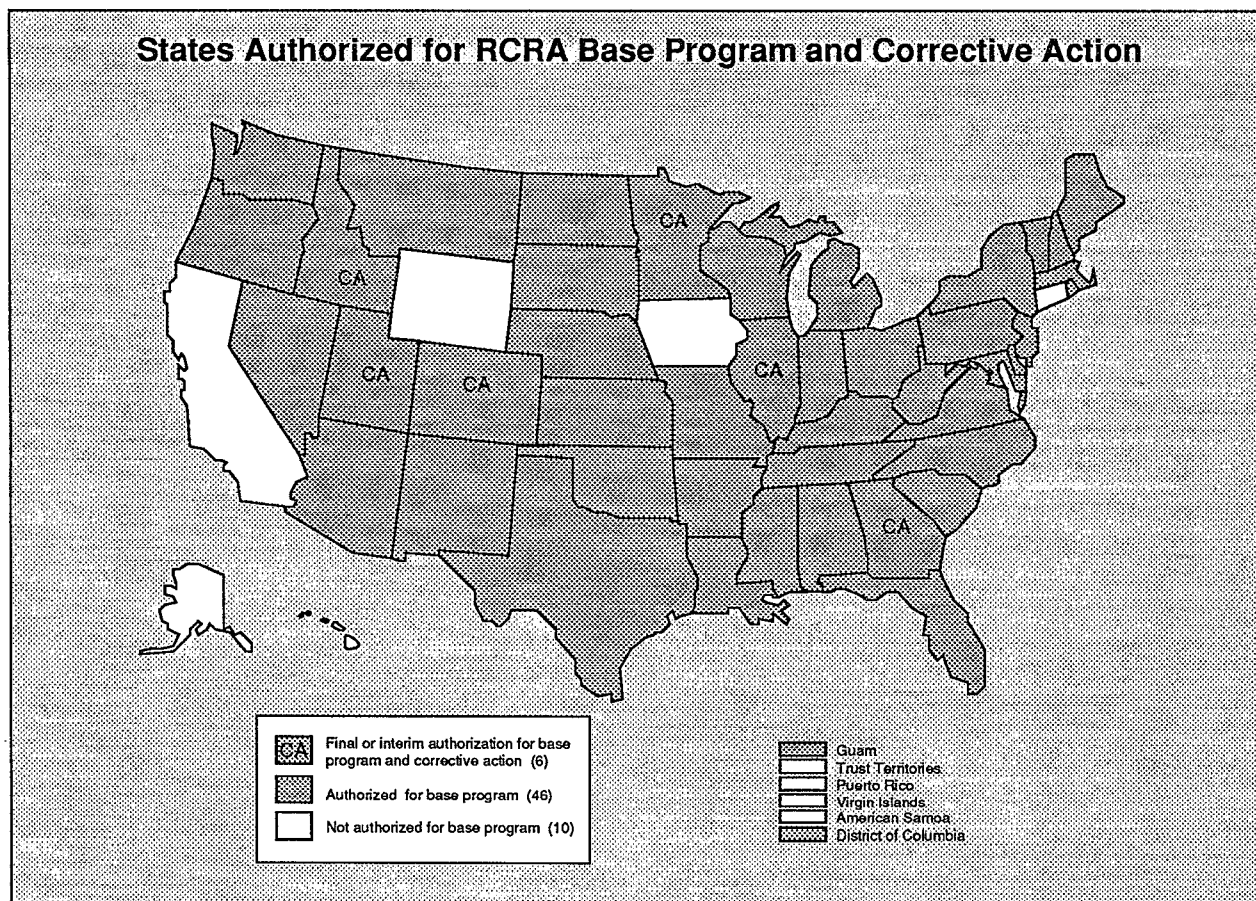
TABLE 2

Current Roles Contrast Sharply With Perceived Appropriate Roles			
Perception of Appropriate Roles	Headquarters	Regional Offices	States
	<ul style="list-style-type: none"> • Develop national policy/guidance to ensure national program consistency • Analyze national trends • Establish overall program direction • Develop and help provide training and technical assistance • Oversee regional offices 	<ul style="list-style-type: none"> • Oversee state programs • Provide technical assistance and support • Implement only when state is not authorized or unwilling 	<ul style="list-style-type: none"> • Responsible for all day-to-day operations • Primary contact with industry and the public • When authorized, work jointly with EPA
Perception of Current Roles	<ul style="list-style-type: none"> • Policy/guidance often late or inadequate • Require excessive, meaningless reporting • Second-guess regions, especially regarding authorization • Oversight of regions lacking or limited to numeric reporting 	<ul style="list-style-type: none"> • Conduct intensive oversight • Require excessive meaningless reporting • Second-guess state technical decisions; frequently duplicate state work • Roles of regional office/state unclear to industry, environmental groups 	<ul style="list-style-type: none"> • Make unrealistic commitments then fail to meet them • Roles of regions/states often unclear to industry, environmental groups

Some states feel that EPA staff are rewarded for finding deficiencies, rather than for helping states to succeed. States were unanimous in their perception that they are judged by higher standards than those by which EPA judges itself. Many EPA regional and headquarters' offices agree with this assessment, although some feel that EPA is held to the same or even higher standards.

The scope of EPA's oversight of state programs is a point of considerable disagreement. As program responsibilities have expanded more rapidly than resources, the states have become more vocal in suggesting that EPA's oversight be limited to the activities it funds. When conducting a capability assessment of a state, for instance, EPA's current policy requires "...an evaluation of the state's entire

FIGURE 5



authorized program, not just the activities funded by EPA." Coupled with the fact that the states think they have little impact on establishing priorities and expectations, this policy causes substantial friction.

The regions, on the other hand, express concern that pressure to meet Strategically Targeted Activities for Results System (STARS) commitments (EPA's management accountability system) and achieve the time frames outlined in the Enforcement Response Policy for taking follow-up action on violations is causing them to use regional resources to perform base program activities in authorized states. They cite inability to impose appropriate sanctions on state programs and to withdraw clearly inadequate state programs as major problems with the existing oversight and authorization processes.

EPA lacks a mechanism to differentiate treatment of "good" state programs from marginal ones. Oversight of strong state programs is virtually

indistinguishable from that of states with limited experience or marginal programs. Failure to differentiate oversight undermines the states' incentive to maintain high performance levels and diverts resources from states that need more oversight, training, and technical assistance.

RECOMMENDATIONS:

- Define exactly what the program is buying with federal grants to the states for RCRA implementation: Is it the entire state program that is functioning "in lieu of" the federal program, or only those activities specifically paid for with federal dollars?
- At the same time, clarify the scope of EPA's oversight.
- Redefine current methods of oversight to be supportive of states' roles and responsibilities and to focus on meaningful measures of progress.

- Tailor the degree of oversight to the experience and ability of a state, exercising greater oversight of states with limited experience or marginal programs.

Communication

Good communication is important to the success of any relationship. Poor communication exacerbates other frictions or weaknesses in the state/EPA relationship.

Poor Communication Undermines Program Efficiency

FINDING: As a result of poor communication, staff in headquarters, the regions, and the states have no shared understanding to form a sound basis for interpreting and evaluating the program's rules.

DISCUSSION: Substantial friction in the federal/state and headquarters/regional relationships stems from ineffective or nonexistent communication. Without a common basis for understanding and interpreting the rules, EPA staff feel the need to replicate the state's review and decision-making processes. This duplication of review results in inefficient use of resources, leads to slower processing and decision making, reduces the feeling of program ownership, provokes accusations of second-guessing, and generates considerable resentment.

RECOMMENDATIONS:

- Encourage more staff-to-staff level communication between the states and the regions through regular meetings, workshops, joint training exercises, and rotational assignments.
- Encourage attendance by headquarters personnel at mid-year meetings with the states.
- Improve communication through use of better guidance, model orders/agreements, etc., and through workshops attended by headquarters, regional, and state personnel.

Frequent, Informal Communication Reduces Friction

FINDING: Communication within EPA and between EPA and the states is not adequate to support the complex, fast-moving RCRA program.

DISCUSSION: Frequency, timing, and style of communication are important. Respondents feel that late, inadequate, or no feedback is responsible for many misunderstandings. Respondents cited vague or undefined concepts (e.g., equivalence), lack of articulated criteria (e.g., capability), infrequent feedback on performance, and late guidance as common examples of communication problems. Guidance is often slow to reach states, which begin implementation activities on their own initiative. When the states receive late guidance and are forced to follow it, frustration and friction result. This is in large part a function of the states' perceptions that guidance is, as the term implies, just that. States often feel that EPA miscommunicates its intent by calling a document "guidance," but giving it the weight of a regulation. (This issue and suggestions for addressing it are discussed in the Regulations chapter of this report.)

Frequent, informal communication is viewed as a sign of a healthy relationship. In the case study in Appendix B, monthly meetings between EPA and the state had a major effect on improving relations. EPA made an effort to involve staff from state district offices, which helped increase communication and involvement among the parties.

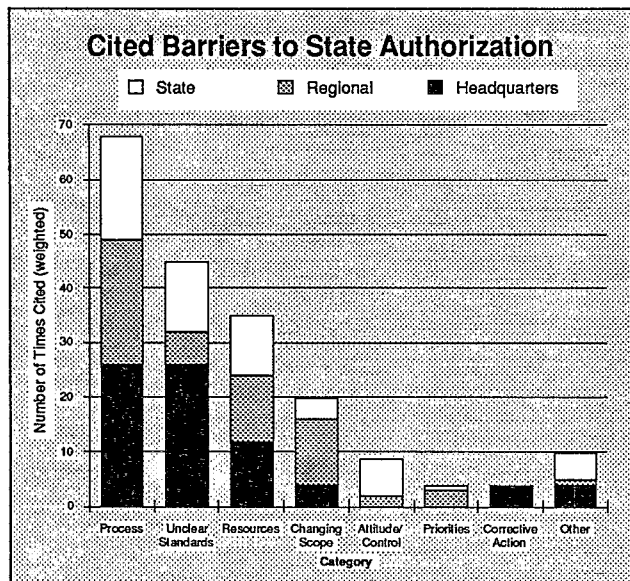
RECOMMENDATIONS:

- Emphasize the importance of issuing timely guidance documents, and incorporate this concept into headquarters' performance standards.
- Institute a process to ensure that the states and the regions are informed when guidance is issued, and provide ready access to the documents. Review and revise the EPA directive system to make it work effectively.
- Identify program areas where timely feedback is essential, and establish appropriate feedback mechanisms. (One region recently began providing on-site oral feedback immediately following oversight inspections and then issued a write-up subsequently.)
- Increase state/EPA communication through more frequent formal and informal contacts, including use of Intergovernmental Personnel Assignments (IPAs) and technical assistance.

State Authorization Process

The process by which EPA authorizes states to run their own program is the most frequently cited

FIGURE 6



barrier to authorization (see Figure 6). It serves as a lightning rod, focusing all of the tensions in the federal/state relationship into a decision-making process that ultimately defines the ownership and control of the program. Among other things, the process suffers from statutorily imposed constraints, a lack of clear priorities as well as nationally designed and accepted goals, unclear roles between headquarters and the regions, and unrealistic expectations and standards. Further, the ever-changing and prescriptive nature of RCRA is difficult to accommodate in authorization.

HSWA Greatly Complicated State Authorization

FINDING: RCRA itself is the source of many authorization problems.

DISCUSSION: The authorization criteria established by RCRA in 1976 assumed a relatively stable program as the foundation for authorization. Until 1984, authorization was essentially no more difficult for the states or EPA than delegations experienced early in other environmental programs.

In 1984, HSWA fundamentally changed the nature of authorization in two ways. First, it established a permanent system of dual federal/state regulation by providing that all requirements imposed under HSWA authority are effective immediately in all states, regardless of their authorization status. However, EPA must implement and enforce these HSWA requirements

until the states become authorized to operate their own programs. This dual regulatory system put EPA in the difficult position of moving back and forth routinely between implementation and oversight roles, with some individuals having to assume both roles at once.

Second, HSWA created a constantly changing regulatory program. A state must maintain a program equivalent to the federal program in order to retain authorization. The authorization process was designed for the relatively stable pre-HSWA program and cannot deal well with HSWA's tidal wave of change. This difficulty is compounded by the fact that the changes are often fundamental and structural in nature (as opposed to merely changes in numerical standards). Not only must a state agency cope with voluminous changes each year, it must often seek additional resources and authorities from its legislature. Many states now question whether receiving and maintaining authorization is worth this extensive use of state resources.

Priority of Authorization Is Unclear

FINDING: Although the regions and the states believe authorization should be a high priority for EPA, EPA is sending them mixed messages. (See Figure 4.)

DISCUSSION: EPA says authorization is one of its highest priorities, but there are several indications that authorization's actual priority is much lower than the priority set for many other programmatic activities. For example, measures in the Strategically Targeted Activities for Results System for permit, enforcement, closure, and corrective action activities have increased over the past few years, in contrast to state authorization, which was dropped as a measure in 1987. (A state authorization measure will be added in fiscal 1991.)

Further, examining regional resource allocations vs. resource use for authorization reveals that the regions are diverting authorization resources to support other activities. For fiscal 1990, 43 work years were allocated to the regions for state program activities (of which authorization is only one). However, only 31 work years are being used for *all* state program activities. This ambiguity in priority also results in underfunding of supporting activities for authorization. For example, the Office of General Counsel and each Office of Regional Counsel (ORC), which provide the necessary legal support for authorization, is each allocated only half of a work year for authorization and state program issues.

Interviewees suggested that, particularly in ORC, these resources are frequently shifted from state authorization and state program activities to higher-priority and higher-visibility programs, such as enforcement and corrective action.

RECOMMENDATIONS:

- Clarify the priority of authorization activities, particularly for corrective action.
- Ensure that appropriate resources are available and used for authorization activities, particularly in ORC.

States Think EPA's Expectations Are Unrealistic

FINDING: States believe that EPA has unrealistic expectations for authorization.

DISCUSSION: Rather than examining the overall environmental effectiveness of a program, the states believe EPA compares every aspect of a state's program to some theoretical "ideal." Since the ideal program does not exist, most states fall short in at least some categories, and considerable discussion back and forth with both the regional offices and headquarters ensues before a determination of adequate capability can be made. States believe that they are held to higher standards than those by which EPA judges itself.

For example, one state told of its struggle to be honest about the impact of limited resources when applying for corrective action authorization. In its draft application, the state noted that corrective action work would be undertaken as resources allowed. The region was reluctant to accept this language, insisting that the state needed to demonstrate from the outset the ability to fully implement the corrective action program. After lengthy discussion, the region and the state agreed on acceptable compromise language stating that priorities and specific activities would be negotiated between the two parties on an annual basis. However, headquarters then insisted that the state remove the language. Several rounds of discussions ensued between headquarters and the region, and the region and the state, before the authorization process could proceed. Although the language was finally accepted by all parties, failure to recognize and allow an honest discussion of potential resource limitations caused unnecessary delays in authorizing a competent, committed state, and engendered bad feelings among the three parties.

RECOMMENDATIONS:

- Recognize that resources are limited, and support state efforts to plan and set priorities for activities when applying for additional authorization.
- Where possible, clarify the activity/support a state will need to assume authorization for a particular activity.

Actual Roles in the Authorization Process Differ from Theoretical Roles

FINDING: Dual review of authorization packages by headquarters and the regions is inefficient and is the source of considerable tension in both the headquarters/regional and the EPA/state relationships.

DISCUSSION: At present, the states, the regions, and headquarters are to play the following roles in the authorization process:

- States are to submit complete authorization packages to the appropriate EPA region no later than the applicable "cluster" deadlines.
- EPA regional offices are to conduct detailed reviews of applications (including assessing capability), identify and refer to headquarters those issues of national concern, and provide technical assistance to the states.
- EPA headquarters reviews applications and provides comments to the regions, develops national policy and guidance, and provides technical assistance to the regions and the states, as appropriate (see Table 2).

In theory, the dual review within EPA was designed to minimize the risks of authorizing deficient state programs and to ensure national consistency. In practice, it has developed into the major source of friction in the headquarters/regional and EPA/state relationships.

In addition to the regional offices, the Offices of Solid Waste, Waste Programs Enforcement, and General Counsel each has application review responsibilities. Differing and often parochial concerns, plus a lack of shared understanding among these three offices as to roles, accountability, and what is acceptable strain relationships and send mixed signals on national policy issues to the regions and the states. Further, there is confusion over the meaning of "headquarters consultation."

In practice, it is not just consultation; it is a de facto concurrence by all three headquarters offices. The result is an overly lengthy process.

RECOMMENDATIONS: The easiest and perhaps most effective way to improve both the regional/headquarters and the EPA/state relationships is to more fully delegate authorization decisions to the regions. (A "paper delegation" currently exists, but is not being implemented.) While there is some agreement about further delegation being appropriate, there is disagreement over the scope and timing of such delegation. Three different approaches were suggested.

- Provide for immediate, full delegation to the regions.
- Increase delegation during a trial period, with headquarters consultation on a limited number of revision applications per "major" rule per region.
- Increase delegation during a trial period, with headquarters consultation on a larger number of applications and ability to review all *Federal Register* notices before publication.

Authorization Standards Are Unclear

FINDINGS: The states and EPA believe the lack of clarity in the standards for several key authorization criteria are a barrier to the authorization process (see Figure 6).

DISCUSSION: Three of the authorization criteria established by the statute are consistency, stringency, and equivalence. These three criteria contain the seeds for controversy and friction because neither EPA nor the statute provides guidance as to which criterion must control when they conflict with each other. This report considers only equivalence and capability, a non-statutory but contentious standard. It does not address which more stringent state requirements are acceptable, nor does it define "consistency."

Equivalence

Determining whether a state's program is equivalent to the federal program is difficult because of RCRA's broad scope and complexities. States may impose more stringent requirements if they do not compromise consistency with the federal program. Although many states have adopted regulations identical to the federal requirements, some states object to EPA's unwritten definition of

"equivalence" as meaning virtually identical. These states feel that such a definition inappropriately restricts their flexibility for regulating hazardous waste.

The dilemma is how (or whether) to allow for a definition of "equivalence" that truly means equivalent, and at the same time ensure speedy authorization. The two goals appear to be at odds. As learned from early experience with RCRA, it is very time-consuming to determine equivalence in effect, and efforts to do so frequently cause friction between EPA and the states as each defends its own regulations.

Capability

Capability assessments involve an in-depth evaluation by EPA of all aspects of a state's program. The purpose of the assessment is to determine whether a state is effectively implementing the base RCRA program, and how that state may implement additional RCRA program areas. The regions, the states, and some headquarters respondents feel that standards for what constitutes adequate state capability are unclear and a moving target. One respondent observed: "It is one of the great mysteries of life."

Capability assessment illustrates both the risks and the tensions inherent in the authorization process. In RCRA's early days, EPA was accused of authorizing "paper programs." To minimize this risk, the regions and headquarters now assess state capability as part of the authorization review process. The result may be that EPA's response to Congress' "paper program" criticism is now frustrating Congress' overarching intent that RCRA be delegated to the states. EPA has initiated a work group that is developing revised guidance on capability assessments and will consider this study's recommendations.

RECOMMENDATIONS:

- Establish clear standards for determining "equivalence" and "capability."
- **Equivalence** - There are two basic options for defining "equivalence": (1) define it as "identical to the federal regulations," or (2) define it as "equivalent in effect." Defining "equivalence" as identical is consistent with current practice in many states. It would also set a clear, easily understood standard, and facilitate and expedite application review. However, these advantages must

be carefully weighed against state concerns over restrictions on their flexibility and the fact that greater program knowledge and commitment often result from developing one's own program.

- **Capability** - The problem in defining "capability" lies in trying to develop objective criteria for what is largely a subjective process. Since all states are different, simple reliance on quantitative measures will not do justice to every situation. One possible approach is to define "capability" by deciding what is "not capable." This approach would recognize the wide variability in capability that exists among states, while simultaneously establishing a "floor" below which authorization could not be granted.
- Consider other options, such as:
 - establishing an independent EPA or outside board of individuals knowledgeable in RCRA to evaluate capability, or
 - establishing national goals (e.g., good environmental ethics and the ability and will to enforce them), to which each state must ascribe as a pre-condition to authorization.

Several Issues in the Existing Process Need Attention

FINDING: Although there is considerable support for adopting a new authorization process, the states, the regions, and headquarters cite issues that must be addressed if the current process is left in place.

DISCUSSION: Figure 7 depicts many of the problems in the authorization process. Further "total quality management" should be conducted to target and examine authorization process problem areas. The three issues that follow are considered high priorities because they are particularly contentious between the states and EPA and within EPA.

Issue 1: Identical vs. Equivalent

State adoption of regulations identical to the federal regulations does not significantly expedite authorization.

RECOMMENDATION: Devise an expedited authorization process. To qualify for the expedited process, an authorized state must adopt regulations *identical* to the federal regulations. States would

submit more comprehensive certifications of legal authority. If EPA subsequently determined that the state's certification contained a material misrepresentation or omission, EPA would immediately suspend the state's authorization. If a state wanted to adopt regulations different from the federal regulations, those regulations would undergo the conventional review process. This option could be limited by excluding certain prespecified regulations, such as corrective action, from expedited review.

Issue 2: Revisiting Old Issues

Many revision packages are often significantly delayed, while old issues for which states were previously authorized are revisited. The states and regions feel strongly that this practice should cease immediately.

RECOMMENDATIONS:

- Focus reviews of new revision applications only on issues they raise.
- Resolve old issues on a separate track, unless they directly affect the new application.

Issue 3: Delays from Incomplete Applications

Incomplete or seriously deficient applications to revise a state's program are inappropriately taking time away from complete applications. In addition to unfairly slowing review of good applications, incomplete or seriously deficient applications increase the number of reviews, the time for each review, and the potential for friction.

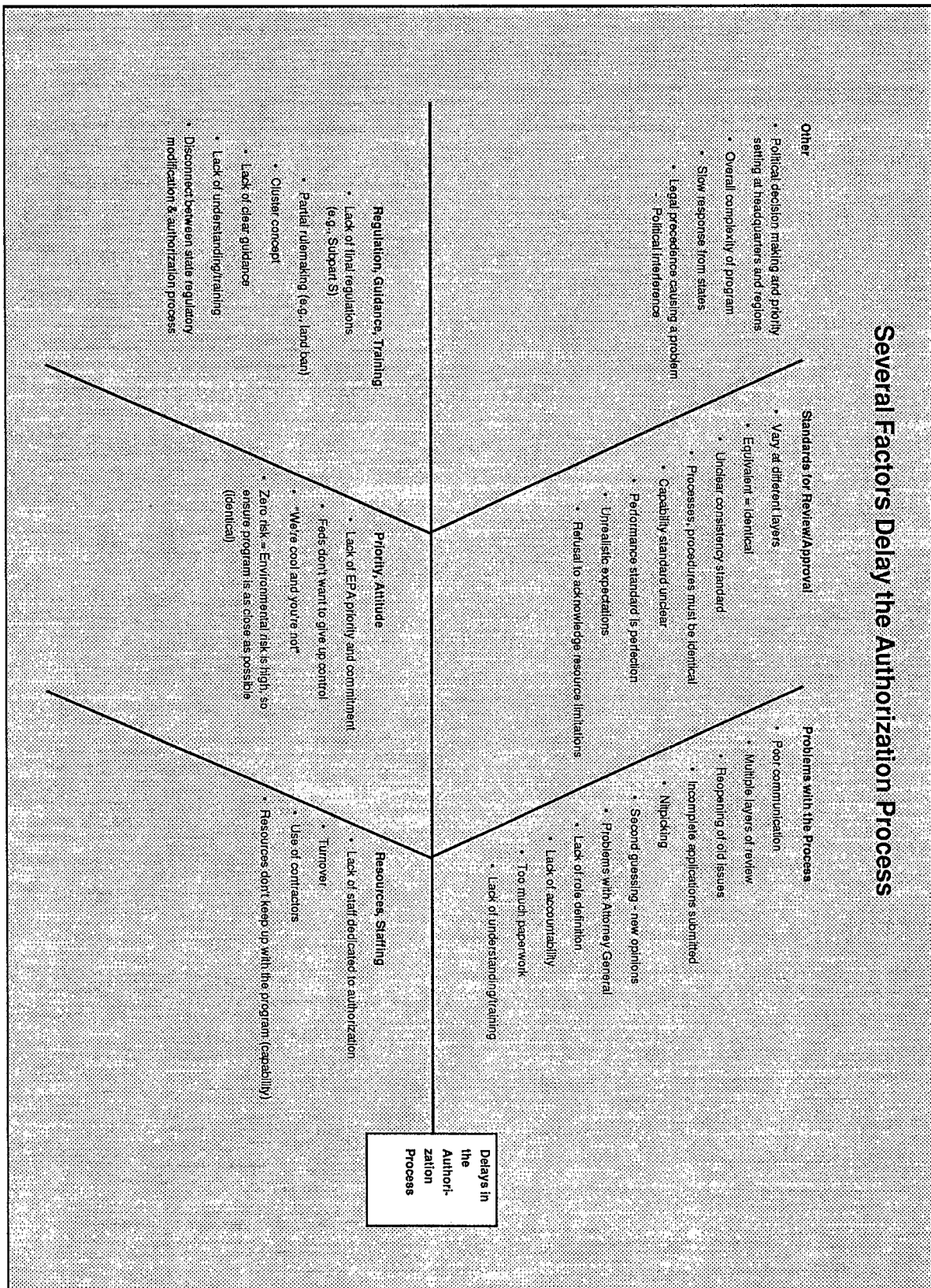
RECOMMENDATION: Adopt a dismissal procedure to promptly return incomplete or deficient applications to the states, with a request to resubmit a complete application. Dismissed applications would be accompanied by a listing of what is needed to make the application acceptable and an offer of technical assistance.

A New Authorization Process May Be the Wiser Choice

FINDING: Both EPA and the states feel that the authorization process must be made easier.

DISCUSSION: The challenge in revamping the authorization review process is to foster greater efficiency and relieve institutional tensions without incurring an unacceptable decline in the quality, consistency, or capability of state programs.

FIGURE 7



Although changes to the present system may reduce current tensions, some tension is inherent in the system simply because of the inequality of the roles of EPA and the states.

The following new process options would apply only to states that are already authorized for the base program, and in many cases would be coupled with an easier withdrawal process. The options can be used in combination to provide the most flexibility for authorizing states, and for recognizing the differences in capability, resources, and willingness among states.

Limited Self-Certification

In its purest form, self-certification would mean that a state would be authorized upon certification of the state Attorney General that the state has all the necessary statutory and regulatory authority to implement RCRA. This pure form of self-certification may be more acceptable if it is coupled with certain limitations. Some limitations, which can be used singly or in combination, include:

- limiting the duration of authorization based on self-certification to five years, at which time the program would revert to EPA, unless the state had demonstrated proper capability and had recertified its legal authority;
- limiting the eligibility to self-certify to those states that, in the Regional Administrator's opinion, have been doing a good job, as indicated by the annual program grant reviews; and
- excluding major program elements, such as corrective action and the land ban, from self-certification.

Limited Partial Authorization

Recognizing that not all states have the needed resources or the desire to assume *all* elements of authorization, EPA would allow partial authorization. EPA would specify a base set of requirements that all states must adopt, and a set of optional requirements (e.g., corrective action) from which the states could choose without risking full program reversion to EPA. EPA would implement and enforce those parts of the program that the states do not adopt.

Commissioning

All federal regulatory and statutory requirements would automatically become effective

in a state, unless a state modified or vetoed the requirement before its effective date. The state would then directly implement and enforce the federal requirements. States could issue their own requirements, but they would not be part of the federal program. This option might also require allowing slightly greater federal preemption in cases of clearly inconsistent state requirements.

Conditional Authorization

After submitting an application, a state would be authorized within a specified time frame, contingent on correcting legal authority or capability deficiencies. A state would be eligible for conditional authorization, unless the application contained an essential omission or inaccuracy ("stoppers"). If the state met all of these obligations, the conditional authorization would automatically become a final authorization at the end of the specified time. Conversely, if EPA were not satisfied that the state had fulfilled the conditions, EPA would announce its decision to withhold authorization.

RECOMMENDATION: More fully examine the legal and implementation aspects of these four options, with the goal of adopting a new approach to authorization that is better tailored to the differences among states.

Program Withdrawal Should Be Made Easier

FINDING: To deal more fairly and expeditiously with authorizing "good" state programs, most interviewees felt that an easier authorization process must be coupled with a more efficient and effective way to deal with deficient state programs.

DISCUSSION: The only program withdrawal option currently available (whereby EPA must withdraw a state's entire RCRA program) is at best a politically difficult and draconian solution for problems that are often confined to only part of the authorized program. Many interviewees, including those representing states, suggested that easier withdrawal would reduce the pressure to authorize only "perfect" programs.

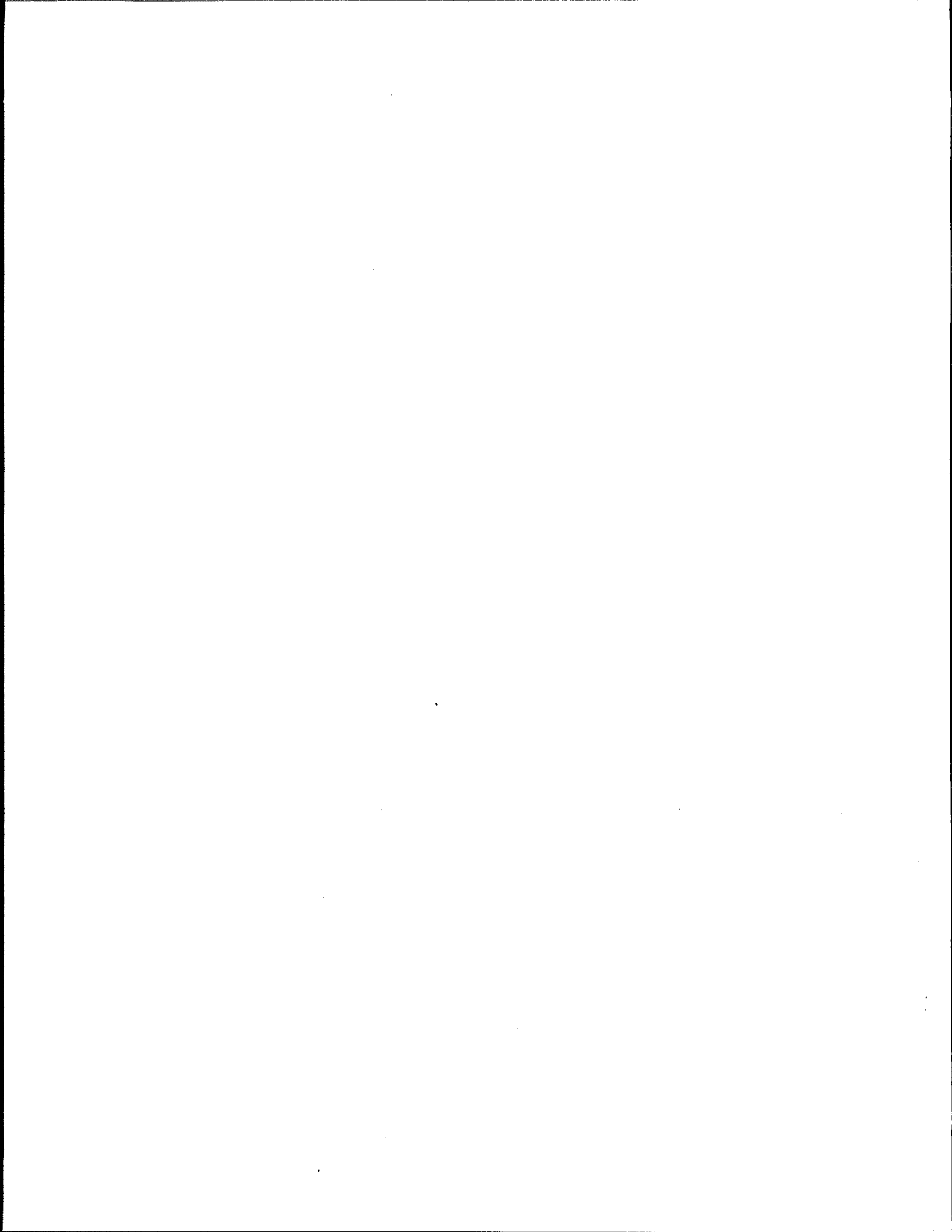
RECOMMENDATIONS:

- Use federal rulemaking to withdraw authorization in lieu of the current adjudicatory hearing procedure.
- Consider adopting a process by which an independent board or audit program composed

of individuals knowledgeable of RCRA would make the withdrawal decisions.

- Formalize a process that clearly defines a series of sanctions of escalating severity, such as public airing of deficiencies, compliance schedules, grant sanctions, suspension of authorization or a probationary period during which EPA would enforce the program, and partial program

withdrawal. This would provide a range of more realistic responses to limited problems and flexibility to allow acceptable portions of the program to continue to operate. Stepwise escalation of sanctions may improve both the likelihood and the effectiveness of getting improved performance from an inadequate or recalcitrant state without withdrawing the program.





CHAPTER 4

The Regulations Machine: Too Many, Too Fast

Introduction

In the early days of the RCRA program, the focus was on developing a regulatory framework to manage hazardous wastes "from cradle to grave." Since 1984, the driving force has been meeting the HSWA regulatory mandates. When the hazardous waste regulations first appeared in the July 1, 1981, edition of the Code of Federal Regulations, they covered 209 pages; in the July 1, 1989, edition, they required 509 pages—an increase of almost 150 percent.

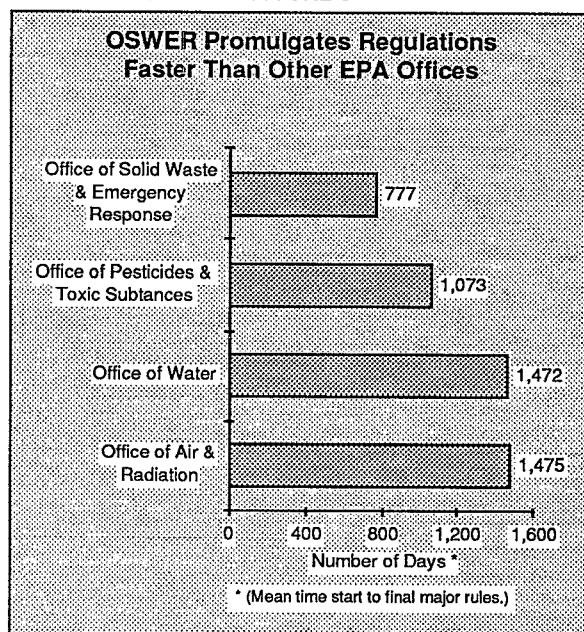
The RCRA program staff and management are conscientious, hard-working, and environmentally concerned. They should be commended for their outstanding success in meeting the many HSWA mandates, a list of which is found in Appendix A. They have developed large numbers of complex regulations faster than any other program office within EPA (see Figure 8). However, this success in developing regulations has been achieved at the expense of other important program objectives, and has resulted in high staff burnout and turnover in the RCRA program.

The Regulations Subcommittee focused on three general areas: the goals and philosophy behind the regulatory program, the regulatory process itself and how decisions are made, and the actual regulatory framework. In general, we found that the program would be well served by lessening the pressure on development of new regulations in favor of: more effort to define an overall program philosophy, additional consideration of implementation issues in regulatory development, and a careful look at the existing regulations to determine, and then make, the most important regulatory corrections.

Findings and Recommendations

The findings of the Regulations Subcommittee address the overall program direction, the work group processes of the Agency and the Office of Solid Waste and Emergency Response (OSWER),

FIGURE 8



the OSWER regulatory framework, and implementation and data management issues.

Program Direction

Program Philosophy and Direction Are Unclear

FINDINGS: Because of the press of meeting HSWA and court-ordered deadlines, EPA has been unable:

- to develop the program's vision,
- to effectively set and communicate the program's priorities, and
- to establish a workable overall program framework that establishes expectations and defines success.

As a result, many individuals and groups perceive the program to be unsuccessful and attempt to force their own priorities on EPA.

DISCUSSION: The lack of a clear, overarching philosophy and direction has resulted in decisions on policy, regulations, and priorities that do not always consistently fit within an overall framework. This has led to a regulatory system that is difficult to understand and, more important, to implement. The lack of a clear philosophy has also resulted in an apparent overemphasis on legal consistency and defensibility, an inability to correct past mistakes (due to legal and/or political vulnerability and resource constraints), and disincentives for creativity and risk taking.

RECOMMENDATIONS:

- EPA, the states, and other interested parties should develop a clear overall vision for the program and a strategy for making decisions. The vision should include where the program is now in terms of the regulations, waste covered, etc., and where the program should be with regard to Subtitles C and D.
- Focus priorities on regulations that will help reach the program's vision.
- Clearly communicate the priorities and expectations to all levels of EPA and to Congress, the states, and others outside EPA.

Role of Cost and Use of RIAs Are Limited

FINDINGS: Regulatory Impact Analyses (RIAs) are not currently used as an effective decision-making tool. A major reason for this limited emphasis is the uncertainty over EPA's ability to use cost as a criterion in decision making under RCRA.

DISCUSSION: A number of reasons were consistently cited for the limited role of RIAs in decision making: the interpretation that the statute limits or prohibits using cost as a factor in decision making, the difficulties associated with accurately estimating costs and benefits, and the timing and adequacy of the analyses (e.g., some RIAs were not completed until after decisions were made, and some only fully evaluated the selected option).

Controversy currently exists both within and outside EPA about whether costs can explicitly be used as part of the decision-making process for RCRA rules. The statutory basis for regulations in Subtitle C is "protection of human health and the environment." Other statutes that EPA administers use unreasonable risk, practicality, etc., as the basis or counterweight for regulatory development. In the preamble to the 1980 regulations, EPA stated

that cost cannot be used to compromise "protection of human health and the environment" in developing regulations under RCRA. Some HSWA provisions, however, allow cost to be considered to some extent. EPA needs to revisit this issue and better specify how cost can be considered in formulating decisions under RCRA before it can decide how to best use the RIA process.

Those familiar with the development of RIAs in RCRA consistently reported that the costs and benefits of these rules are difficult to define. The lack of good data was cited as one of the primary reasons for this difficulty. However, estimating the full costs of compliance is more straightforward than estimating the benefits. While costs can be estimated in dollars, the dollar values of increased safety and resource preservation are harder to derive. Frequently only a portion of benefits (reduced risks) is quantifiable because of data, methodological, and resource constraints. This leads to concerns that RIAs underestimate benefits and disputes over whether costs exceed benefits.

There have been two general schools of thought expressed on whether RIAs should be used in the decision-making process: (1) do the minimum to get the regulations out, and (2) use RIAs earlier and more effectively in the process to evaluate options. The arguments supporting doing only the minimum include: the inability to use cost in decision making; the expense of current RIAs relative to their impact (and the lack of resources to expand the analysis); the general limitations on the quality of RIAs discussed above; and similarly that the problems with measuring benefits would make it difficult for EPA to demonstrate cost-effectiveness.

Supporters of greater use of RIAs argue that: EPA has an obligation to society to only propose rules that maximize benefits (i.e., EPA would make better overall decisions); better RIAs would speed reviews by the Office of Management and Budget (OMB) and the regulatory development process overall; the cost of quality RIAs is relatively small compared with the impact of the major rules that they analyze; and better analysis would enhance EPA's ability to communicate its decisions effectively with stakeholders (e.g., Congress, industry, the public, the states, OMB).

RECOMMENDATIONS:

- Work with OGC to revisit and clarify the role of cost in decision making in RCRA.
- Choose the appropriate use of RIAs, to either: (1) use minimal resources to meet primarily

administrative needs, or (2) ensure that RIAs are effectively used as part of the regulatory decision-making process.

- Place more emphasis on ensuring that legitimate options are considered at the options selection stage.

Agency Work Group Process

EPA's process for developing regulations involves the participation of many EPA offices in a group known as a "work group." This process has not been effective for developing RCRA regulations. The issues discussed in this section involve the overall EPA work group process, and as such are beyond the RCRA program's ability to remedy unilaterally. However, because many people interviewed raised the point that the process has been ineffective for regulatory development, and because there are some steps that OSWER can take to improve the process, the Subcommittee felt it was important to include this issue.

In addition to this Subcommittee's work on this issue, other groups within EPA are also addressing this problem. The Agency Steering Committee has formed a number of smaller work groups that are addressing different aspects of the regulatory development process, including work group operations. The Regulatory Development Branch within the Office of Policy, Planning, and Evaluation has also undertaken a variety of projects to improve and expedite the process. The branch is providing a Regulatory Coordinator to select work groups to help the work group chair with procedural matters. It is also offering work group chairs a training course designed to develop work group managerial skills.

Offices Need Better Representation in Work Groups

FINDING: Regulatory work group participants have not consistently represented the views of their office or division.

DISCUSSION: A number of factors contribute to the lack of adequate office representation on work group committees. First, work group members are often at a junior level and are not aware that they are expected to represent their office's official position. This applies also to regional and state work group members, who should represent their larger constituencies as well as their particular organizations. Second, the work group

representatives are not empowered by their managers to make decisions for their office. Third, where a higher-level management decision is appropriate, work group members generally have not briefed superiors on the issue(s) at an early stage in the process. The resulting lack of adequate, timely involvement by management in other offices leads to wasted effort on tangents, encourages raising issues at the eleventh hour, and ultimately slows the process.

RECOMMENDATIONS:

- OSWER should actively encourage appropriate selection of work group members within its organization and others.
- Clearly explain to work group members their role and responsibilities, perhaps through a short training session. Work group members should keep their management informed on issues as they arise.
- Include work group participation in performance standards.

OSWER Coordination Is Lacking

FINDING: All offices in OSWER are not always involved adequately in the early stages of developing a regulation. OSWER divisions and offices, other than the one writing a regulation, are not always aware of policy decisions being made that relate to their programs.

DISCUSSION: The OSWER programs are interrelated. Actions taken in one office may affect the actions or decisions in another. For example, a regulation to control a specific waste may have an effect on corrective action involving that waste. Often these overlaps or conflicts can be resolved early in the process if there is appropriate work group representation, and if issues are raised early in the regulation development process.

RECOMMENDATIONS:

- Develop an internal OSWER options selection process to ensure early internal OSWER agreement on a rule and to aid early active work group participation within OSWER.
- Create incentives to encourage managers and staff to actively communicate and coordinate on their projects as well as participate in those of other divisions and offices as appropriate.

Work Group Decision-Making Process Is Inefficient

FINDING: Decisions made during the work group process are "re-made" at the end of the process, without penalty to those responsible for not addressing the issue earlier or for not accepting an earlier decision. In fact, there is often a reward for such "late hits."

DISCUSSION: The Regulations Subcommittee found six major areas that led to late resolution of issues: (1) the lack of adequate office representation, described previously; (2) how the regulatory development reward system works—any work group member can stall the process because total consensus is required, and "late hits" are frequently rewarded by reversal of earlier decisions; (3) turnover of key senior managers, which can delay decisions because of the perceived need to wait for a permanent replacement or the time it takes for the new manager to "get up to speed"; (4) having an agreement "in principle" vs. "in writing," which can lead to a "false consensus" and delay the process later on; (5) lack of complete regulatory packages until late in the process; and (6) the need for consensus, which, while not required in the decision-making process, has become part of the organizational culture.

RECOMMENDATIONS: In addition to the recommendations in the previous sections:

- Actively discourage "late hits" by working with the upper management of other programs.
- Require the distribution of the full text of the regulation and preamble to all work group members before work group closure to avoid the false consensus problem.
- Promote the development of a process to obtain early "buy-in" on options or approaches by other EPA offices. Once agreement has been reached, develop a system for penalties for subsequent "late hits."

Work Group Role of OGC Is Unclear

FINDING: Some policy makers feel that there have been misunderstandings regarding when the Office of General Counsel's (OGC's) advice is legal advice and when it is policy advice.

DISCUSSION: The interviewees fairly consistently described the evolution of OGC's role over time. In the early years of developing the RCRA regulations,

OGC "sat side by side" with OSW, developing policy and writing the actual regulations to meet tight court-imposed deadlines. As the years passed, OGC in general did less drafting of the regulations. However, its role in making policy recommendations, as opposed to only defining legal positions and risks, remains blurred.

Sometimes policy makers misconstrue policy advice from OGC as legal advice. This has led in part to eliminating options and to the conservative and complex program currently in place. However, at times OSW staff members have also used legal advice to avoid options they thought were unacceptable. Many commenters and OGC agree that OGC's role should be to evaluate and array the relative legal risks corresponding to each potential option for the program office to consider. And while OGC staff can add valuable policy input into the process in many instances, it is important that opinions on policy be clearly delineated from those on legality.

When OGC members have been part of the regulatory development "team" from start to finish, the process has worked more effectively (e.g., the Land Disposal Restrictions regulations). However, OGC resource levels constrain its ability to work on each regulation this way.

RECOMMENDATIONS:

- OSWER and OGC should explore ways to improve communications concerning (1) legal risks and (2) policy versus legal advice.
- OGC should request additional legal resources, and OGC and OSWER should work together to identify regulatory priorities to assist OGC in using its existing legal resources to their maximum efficiency.

Ex Parte Interpretation Limits Work Group Role of States

FINDING: Both limited resources and EPA's current interpretation of *ex parte* communications limits the states' ability to participate effectively in the EPA regulatory development process.

DISCUSSION: The states currently can participate in the EPA work group process up until proposal of the regulations. EPA's current position is that after proposal, oral communication with the states (as well as other interested persons) on the substance of the regulations must be summarized in writing and placed in the public docket. This makes it

difficult for EPA staff to efficiently include states in post-proposal work group activities.

Given the RCRA program's goal of implementation by the states, it becomes even more important that the states be actively involved throughout the entire regulatory development process.

RECOMMENDATIONS:

- Encourage OGC to reevaluate the applicability of *ex parte* communication restrictions to state representatives.
- Work with OGC to determine other methods of involving the states in regulatory development after proposal.

Resources Constrain Regional and State Participation

FINDING: The regions and the states do not consistently participate in the regulatory development process.

DISCUSSION: The regions and the states bring a "real world" perspective to the regulatory development process. However, certain realities impede their consistent participation in EPA work groups. The regions often cite their shortage of travel money as the critical constraint to participation. Also, they are not allocated work years to participate in regulatory development, and expectations for the number of permits, enforcement actions, etc., are not typically reduced to correspond to efforts redirected to supporting the rulemaking process. When the regions or states have participated actively in developing a regulation, OSW staff has generally been very responsive to the issues raised. Because of their concerns with implementability, an added benefit of active regional and state participation will be the development of regulatory solutions that are less resource-intensive.

RECOMMENDATIONS:

- The OSWER Assistant Administrator should commend OSW staff for actively seeking and responding to regional and state input on implementation.
- Specifically earmark travel money and work years for regional and state participation in the regulatory development process in exchange for a commitment to be actively involved in the process.

Implementation and Enforcement Issues

The Regulations Subcommittee generally found that the press of HSWA deadlines severely limits EPA's ability to address implementation issues.

Regulations Should Balance Flexibility and Clarity

FINDING: There is a fundamental tension between regulations that are flexible to respond to variability in the industrial community and regulations that are less flexible but more easily enforced.

DISCUSSION: The easiest regulations to understand and write permits for or enforce are those that are objective or numeric in nature. These regulations include: the marking and labeling requirements for containers (40 CFR 262.34(a)(2) and (3); the generator 90-day accumulation period (40 CFR 262.34); and the surface impoundment two-foot freeboard requirement (40 CFR 265.222(b)).

On the other hand, regulations that contain subjective standards of performance are the most difficult to understand and to enforce. An oft-cited example of a subjective regulation is the waste analysis plan requirement (40 CFR Part 264.13/265.13), because the burden falls upon the enforcement or permitting official to determine whether the plan is "adequate" to meet the particular needs of the facility.

The phased-in promulgation of regulations over a long period of time also creates confusion. The Congressionally mandated phasing of the Land Disposal Restrictions (LDR) regulations is a good example. The statutory requirement to establish LDR regulations was enacted in November 1984. The regulations implementing the statute have been published at various times since 1986. The numerous time extensions granted for certain wastes made it difficult to determine which wastes the LDRs applied to. As a result, state enforcement personnel have been somewhat reluctant to inspect facilities to monitor compliance with the restrictions and to enforce any similar state regulations until the entire regulatory program is in place.

EPA originally believed that RCRA regulations would be self-implementing (i.e., that the regulated community would be able to easily understand and comply with the regulations with little or no involvement with EPA or the states). In some cases, such as the manifest regulations, they have been

self-implementing. However, an intense, protracted permitting or enforcement effort is often necessary to bring the regulated community into compliance. The most obvious example of this is the ground-water monitoring regulations. The regulated community's lack of compliance and the EPA/state enforcement efforts were severely criticized following an in-depth Congressional investigation of the ground-water monitoring regulations. Because self-implementation did not work, the burden for compliance shifted to EPA and the states to interpret and apply the RCRA regulations through the enforcement process.

RECOMMENDATIONS: Consider the appropriate place on the continuum between flexibility and objective standards for each regulation. Factors to be evaluated include environmental impacts, ability to permit/enforce, and costs to the regions and the states.

Implementation Issues Need Early Consideration

FINDING: Implementation and enforcement issues raised by regulations are not consistently identified or addressed as part of the rulemaking process, although this oversight has been less frequent lately.

DISCUSSION: The current hazardous waste system is plagued by a number of rules that are both difficult for industry to comply with and difficult for EPA and the states to implement—and the requirements continue to grow. In RCRA, as in other programs, a regulated hazardous waste handler literally must do hundreds of things correctly to fully comply with the regulations, yet doing only one thing wrong makes the handler a violator.

RECOMMENDATIONS: Establish a formal system to ensure that the regulations are clear and implementable. Such a system should include at least the following elements: (1) a rule enforceability checklist; (2) a review by an independent editor; (3) training on permitting and enforcement for the regulation writers; (4) mandatory discussion and consideration by upper management of a variety of implementation issues, including permitting and enforcement in the options selection process; and (5) an implementation/enforcement plan that addresses the potential problems resulting from every new rule.

Implementation Costs Should Be Given Greater Weight

FINDING: The costs to the regions and the states of implementing regulations are not effectively incorporated into the decision-making process.

DISCUSSION: The lack of good information on both permitting and enforcement costs makes it difficult to make informed decisions on options and to make effective budget requests. In recent years the program has requested resources from the Office of Management and Budget to implement some major rules, but has not always received them. Also, the perception of the regions and the states that headquarters continues to promulgate regulations without considering or providing the resources necessary to implement or enforce them strains the working relationship and sets the program up for failure.

RECOMMENDATIONS:

- Consider state and regional implementation and resource requirements systematically in the regulatory development decision-making process.
- Include in the OSWER budget state and regional resources for permitting and enforcement of new regulations.
- Develop estimates for implementation costs as part of RIAs.
- If requested resources are not obtained, make appropriate adjustments in the expectations of regional and state activities.

Lack of Feedback Compromises Program's Effectiveness

FINDING: The apparent lack of a clear feedback loop from the regions, the states, and industry on how the regulations are working limits the ability of the regulation writers to correct and avoid repeating errors.

DISCUSSION: EPA's regulation writers tend to become insulated from the implementation issues created by the regulations. Incorporating some formal feedback mechanism into the regulatory process to identify the strengths and weaknesses of existing regulations has been proposed in the past.

However, resources have not been allocated to this activity because of tight resource constraints and the mandates for issuing new regulations.

RECOMMENDATIONS:

- Develop a process for revisiting major regulations within 12 to 18 months of their promulgation. This process could solicit feedback from the regions, the states, and industry. This type of evaluation should include such criteria as enforceability, environmental impacts, and clarity.
- Allocate either new resources or resources from other activities (e.g., by postponing development of other new regulations) to support this process.

Use of Preambles Is Excessive

FINDING: OSWER has used lengthy preambles to replace clear regulatory language.

DISCUSSION: The substitution of lengthy preambles for clear regulatory language makes implementation more resource-intensive, since more time is required to review and interpret a rule, and it may add ambiguity to the rule. Also, it can put state and EPA field staff at a disadvantage, since they do not often have access to the *Federal Register* preamble. As Table 3 illustrates, the ratio of preamble language to regulatory language is in most cases at least 3:1.

TABLE 3

Preambles Are Excessively Long			
<u>Regulation</u>	<u>Preamble Pages</u>	<u>Regulation Pages</u>	<u>Ratio</u>
Solid Waste Definition	47	8	6:1
Used Oil	38	9	4:1
H.W. Tanks	48	16	3:1
H.W. Exports	17	4	4:1

Preambles should, of course, continue to include responses to major comments received on proposals, although these could appear in a separate background document.

RECOMMENDATIONS:

- Write regulations simply and clearly, with the aim of their being understood without a preamble.
- Use graphics, flow charts, and tables to improve understanding of the regulations.
- Use the preamble judiciously to emphasize a point, or to give examples to ease implementation of performance standards.
- Give state and EPA field offices access to *Federal Register* preamble language.

Outreach Is Insufficient

FINDING: Currently, very limited outreach and training accompany the development and implementation of new regulations.

DISCUSSION: The need for better training and outreach materials on the regulations has long been recognized both within and outside EPA. However, the demands to meet court-ordered deadlines and HSWA mandates for additional new regulations have monopolized the resources necessary for developing these types of materials with each new regulation.

RECOMMENDATIONS: Request and allocate funds to develop an education and training package for both regulators and the regulated community to accompany all new significant regulations. For example, send a plain-English summary of each new regulation to the affected regulated community.

Field Exposure for Regulation Writers Is Limited

FINDING: Staff writing EPA regulations often are not familiar enough with or do not have enough exposure to the types of facilities and industrial groups that they are trying to regulate.

DISCUSSION: Some staff members' lack of field experience and exposure to industry limits their ability to design regulations that both are understandable and work in the field. Developing effective regulations requires various skills (written, technical, legal, etc.). A substantial resource investment in staff training (including site visits and personal interaction with industry) is necessary

for obtaining high quality and productivity. This is especially true, given the high turnover rates within the RCRA program. In recent years, OSW has increased its meetings with outside groups before proposing rules in order to provide some of the benefits of field experience.

RECOMMENDATIONS:

- Make facility visits and interviews a regular part of all regulation development.
- Actively promote rotational assignments among headquarters, the regions, and the states for regulatory development staff.
- Specifically request and set aside travel and/or training dollars for this purpose.
- If more staff time is spent in training, less will be available for production, and so expectations will need to be revised accordingly.
- Actively attempt to meet with the states, industry, and other stakeholders before proposing any significant regulations.

Regulatory Framework

A number of the Subcommittee's findings relate to specific regulations. These include issues with current regulations, needed regulatory corrections, and additional regulatory needs.

Regulations Need Revisiting

FINDING: The press of the HSWA and court-ordered deadlines has prevented EPA from revisiting and refining regulations often enough to effectively implement the program.

DISCUSSION: Many people involved in developing the original regulations in 1980 and 1982 were uniformly concerned about the lack of corrections made to the regulations. They had foreseen that, as data were developed about the wastes covered and the operations of the regulated community, the regulations would be revisited. Many of the needed corrections would alleviate some of the implementation issues the program now faces.

RECOMMENDATIONS: Correct existing regulations before adding new ones. Explain this need to Congress, and agree on priorities for regulatory development. For example, this might include a temporary moratorium on new regulation development for a year or two.

Definitions of "Solid Waste" and "Hazardous Waste" Are Confusing

FINDING: The definitions of "solid waste" and "hazardous waste" are difficult to understand and implement for EPA, the states, and industry. Permitting and enforcement are hampered by the complexity of these definitions.

DISCUSSION: EPA receives extensive inquiries about the definitions of "solid waste" and "hazardous waste." For example, the RCRA Hotline received an average of over 1,000 calls a month in 1989 on the definitions. These calls accounted for approximately 34% of all Hotline calls received on the hazardous waste regulations. The state and regional personnel interviewed were particularly frustrated by this problem. Specifically, they cited the recycling regulations (40 CFR 261.2(e) and 261.6) and the numerous exclusions and exemptions throughout 40 CFR 261 as extremely difficult to understand and enforce due to their complexity.

The RCRA program had a very difficult task in devising definitions and recycling rules that covered a diversity of industrial situations, and deserves credit for those past efforts. However, the program now needs to improve on them. Unfortunately, few individuals were able to make concrete suggestions about how to specifically improve the definitions without some statutory revisions. In a number of interviews, individuals also indicated that changing these definitions would reopen a whole web of regulations for possible legal challenges because they were in some part based on these definitions.

RECOMMENDATIONS:

- Revisit the definitions of "solid waste" and "hazardous waste" with the goal of making it clear who is in and out of the system, and make them internally consistent.
- Establish a philosophy of regulatory coverage as it pertains to recycling, waste by-products, and waste mixtures.
- Centralize the numerous exemptions within Part 261, as well as Parts 264, 265, and 270, in one common area of the regulations.

Framework for Managing Industrial Solid Waste Is Lacking

FINDING: There is concern both within and outside EPA over the management of industrial wastes that

are not currently controlled under the Subtitle C system. In contrast, a significant amount of waste now within the Subtitle C system could be managed safely in a less complicated and less restrictive system.

DISCUSSION: Many commenters believe that a protective system should be designed for the majority of industrial wastes not in the current Subtitle C system. However, they also would like a system that is less onerous and more self-implementing than the current Subtitle C system.

RECOMMENDATION: Make the development of an industrial solid waste program a priority, with an accent on self-implementation whenever appropriate.

De Minimis Rule Is Ineffective

FINDING: EPA's program for designating which wastes do not require the controls of the Subtitle C program has been largely ineffective.

DISCUSSION: HSWA brought a substantial amount of new wastes into or potentially into the Subtitle C system. Among the large numbers of types of wastes in the system, there is some subset that can be managed just as effectively in a less restrictive fashion — for example, listed hazardous wastes that contain a very small (de minimis) concentration of hazardous constituents after treatment. However, EPA's system for "delisting" (i.e., designating certain listed hazardous wastes as nonhazardous) is slow, onerous, ineffective, and at times controversial.

RECOMMENDATION: Continue efforts to develop a "de minimis" rule that exempts from the Subtitle C regulations listed hazardous wastes with extremely low levels of hazardous constituents that pose a negligible environmental risk. Such wastes would then not be subject to the more complicated, waste-specific, delisting program.

Self-Testing Should Be Required

FINDING: Lack of a requirement for self-testing and self-reporting has hindered enforcement efforts at generators and potential generators.

DISCUSSION: The RCRA regulations (40 CFR 262.11) allow potential generators of hazardous waste to *apply knowledge* of their process when determining whether they are generating a hazardous waste. This provision has hindered enforcement efforts aimed at regulating generators and potential

generators or individual waste streams under RCRA. There is no self-reporting mechanism to identify generators who claim to eliminate characteristic hazardous waste from the RCRA system. To take an enforcement action, EPA or the state must sample and analyze the waste to determine if the waste exhibits any of the hazardous waste characteristics.

RECOMMENDATIONS: There are several options for dealing with this finding, which are not mutually exclusive:

- Increase or redirect regional and state funds to allow for targeted sampling and analysis.
- Require potential generators of hazardous waste (identified, for example, through Standard Industrial Codes) to routinely sample and analyze their waste to determine if it is hazardous.
- Allow EPA (or the states) to require anyone generating a solid waste to analyze that waste for hazardous characteristics if EPA (or the states) has information that indicates the waste may be hazardous.

Regulations Should Encourage Waste Minimization

FINDING: The increasing stringency of the waste management regime under Subtitle C provides a powerful economic incentive for waste minimization. This incentive will be extended to new wastes as they are brought within the coverage of Subtitle C.

DISCUSSION: EPA's success in promulgating RCRA regulations, including the Land Disposal Restrictions, has substantially increased the cost of disposal. These increases have spurred firms to reevaluate their hazardous waste management practices and their hazardous waste generation rates, and many firms have instituted waste minimization at least in part as a response to these escalating costs. Thus, regulations intended to have the direct effect of improving the management of hazardous waste have had the indirect effect of reducing the volume and toxicity of hazardous waste generated.

Forthcoming regulations may provide an opportunity for targeting specific waste generation activities, as well as maintaining the general economic incentive for waste minimization. Some examples of other regulatory mechanisms that may

promote waste minimization include pollution fees on the generation of waste, disposal tipping fees, and deposits on products.

It may also be possible to design regulations so that firms that undertake waste minimization stay out of the hazardous waste regulatory regime. One idea being considered in a hazardous waste listing procedure is to list wastes by concentration. If the firm's waste is above the established concentration level, it would be deemed a hazardous waste and thus would be subject to control under Subtitle C. The more effective technology for this particular industry minimizes the volume and toxicity of wastes, while the older, more inefficient technology generates more waste at a higher concentration. In this setting, a firm that undertakes the investment in waste minimization stays out of the system.

RECOMMENDATION: Continue emphasizing waste minimization and pollution prevention alternatives in development of the RCRA regulatory framework.

Data for Regulatory Development

Data on Hazardous Waste Management Are Inadequate

FINDING: Data on the hazardous waste management industry have not been collected, analyzed, and used effectively in the development of regulations under Subtitle C. In particular, collection of quality data through the Biennial Report process has not been a priority for the national program.

DISCUSSION: A lack of data has greatly restricted EPA's ability to develop effective regulations. Lack of data on the nature of waste streams has limited EPA's ability to incorporate risk into the decision-making process. Historical lack of data has led to instances of both over- and underregulation. The establishment of national regulatory priorities is impaired by insufficient knowledge of the number and type of facilities handling different types of waste streams.

The Biennial Report process has traditionally been a relatively low priority for the Subtitle C program. Funding for it has not been specifically provided in the RCRA budget. Different regions and states have assigned varying (usually low) degrees of resources to the development and quality assurance/quality control of the data. What data we have are not routinely used to support regulation development. The limited availability of data has also hurt EPA's ability to communicate effectively

with the public, Congress, and the regulated community. This restricts EPA's ability to explain the RCRA program's impact on industry and the environment.

RECOMMENDATIONS:

- Make effective use of the RCRA Biennial Report a priority.
- Reevaluate the workload associated with developing the Biennial Report, and fund it as a separate item in the budget.
- Invest resources in the national management of the Biennial Report, as appropriate, to minimize the resource impacts on states and regions.

Program Needs Data on Non-Regulated Industrial Wastes

FINDING: To develop an effective program for wastes currently outside the Subtitle C system, adequate data on the makeup of the potentially regulated community need to be developed.

DISCUSSION: Many people interviewed believe that many of the complexities and implementation problems associated with the Subtitle C system can be traced back to decisions that were made with inadequate information on the nature of the regulated community. A number of the concerns over waste escaping the current Subtitle C framework can be addressed with an effective Subtitle D industrial waste program.

Many people believe that to develop effective requirements, EPA needs to gather information on facilities potentially regulated under the Subtitle D regulations. The first step in that effort began with the general notification requirements in the proposed municipal solid waste landfill rule for Subtitle D. A number of people also noted that industry may be willing to actively cooperate with EPA to develop at least some of the necessary information, since much of the data are likely to be valuable to both groups.

RECOMMENDATIONS: Evaluate how to effectively develop information on the universe of potentially regulated facilities' waste streams not currently covered by Subtitle C. Include in this evaluation an analysis of the RCRA program's ability to obtain useful information in cooperation with the potentially regulated industries. Based on that analysis, target priorities for future efforts.



CHAPTER 5

The Permit Dilemma: Deadlines vs. Need

Introduction

Before 1980, there was virtually no regulation of hazardous waste by the federal government and little by the states. People in the hazardous waste management business often handled and disposed of the waste carelessly. Much of it wound up in municipal landfills and unlined lagoons, or simply was dumped on the ground. This situation led to major public concern over the problem and the development of the RCRA regulatory framework, with a central feature being the permit program.

The initial regulations for storage and treatment facilities became effective in 1980, and EPA promulgated standards for incinerators in 1981. The program focused on permitting these classes of facilities until 1982, when EPA published regulations for the land disposal facilities. In 1984, the Hazardous and Solid Waste Amendments reshaped the permit program in several ways. The law added new standards, which increased the technical challenge of issuing permits. The added requirement of corrective action expanded the function of the permit dramatically to include both strict management of existing waste and cleanup of contamination from past mismanagement. Perhaps most significantly for permit applicants, the 1984 amendments imposed statutory deadlines of 1988 for issuing permits at land disposal facilities, 1989 for incinerators, and 1992 for storage and treatment facilities. With the basic statutory and regulatory framework fully in place, EPA and the states proceeded with their effort to issue permits to change from the more general "interim-status" provisions that applied to hazardous waste facilities to the stricter controls of permits. (These provisions apply to treatment, storage, and disposal facilities in existence on November 19, 1980, or subsequently brought under regulation. These facilities are allowed to operate under certain less stringent conditions and regulations on an interim basis until final permit determinations are made.)

The RCRA program's broad statutory requirements and its complex regulations and guidance all come into play when a permit is

issued. The permit writer reviews the RCRA facility's application material in the context of the regulations and guidance, considers the specific conditions present at the facility, and creates the document that will control how the facility manages its hazardous waste. Because this task is very complex and requires a skilled, experienced individual, the human element is a very important factor in permit issuance.

There is a comprehensive process for making permit determinations. Along with the extensive information exchanges between the facility and the regulatory agency, the citizens most affected by the operations often participate in permitting decisions. The process is open, with opportunities for both written comments and presentations at public hearings. The result of the process is usually the issuance of a permit, but where circumstances have warranted, the regulatory agencies have issued denials. In addition, many facilities have ceased their hazardous waste management operations in the face of the stringent operating requirements. Parties unhappy with the results of the process have administrative and judicial appeal rights. Considered as a whole, the process is very thorough and helps lead to the best result given the specifics of the facility, be that result a permit issuance, permit denial, or facility closure.

The viability of the permit is especially evident after issuance when it becomes the controlling document for the facility's operation. Operators must constantly ensure that they are managing hazardous waste in conformance with the terms of the permit. The permit also serves as a guide to the inspectors who gather facts for determining the facility's compliance status. If there are violations, the permit is the central document and reference point for the enforcement action. As conditions at the facility change or as EPA develops new regulations, the permitting agency processes the necessary modifications. In all of these ways, the permit is a living document that embodies the statute and regulations, as they apply to the facility's specific conditions.

Now, in 1990, with nearly 1,000 permits issued and the reauthorization of RCRA on the horizon, an investigation of the RCRA permit program's successes and failures will help the program determine what adjustments are necessary. The Permitting Subcommittee was created to perform this study.

Methodology

The Permitting Subcommittee used several methods to collect information for its study. The primary method used a standard questionnaire that the subcommittee developed (see Appendix C). It covered permit priorities, quality, process, timeliness, and waste minimization. Other methods included gathering data from OSWER's information management systems and reviewing earlier reports, such as the Keystone Center Report (1989), the Hazardous Waste Implementation Task Force Report, the Permit Process Workgroup Report (1986), and General Accounting Office reports.

Findings and Recommendations

The findings of the Permitting Subcommittee fell into five major categories: the success of RCRA permits, priority setting, permit quality, the permit process, and the timeliness of issuing permits.

RCRA Permits: A Success Story

FINDING: RCRA permits have improved hazardous waste management practices and have otherwise furthered the environmental protection goals of RCRA.

DISCUSSION: Beginning with very small staffs having limited experience with hazardous waste, EPA and the states initiated an effort in 1980 to bring hazardous waste management practices throughout the United States under the strict requirements of RCRA. The RCRA program had a minimal historical base to work from, unlike EPA's air and water programs, which had federal, state, and local experience before their major permitting and regulatory efforts.

The permit writers began with the base regulations in place for incinerators and for land disposal and storage and treatment facilities and proceeded to call in applications from the potentially regulated community. There was essentially no form or structure to work with, and permit

applicants were slow to respond to the call for applications. When they responded, they sent large volumes of poorly organized material that proved difficult to review. What followed was a series of exchanges between the applicant and the agencies, consuming time and resources, but not leading to much progress in the program.

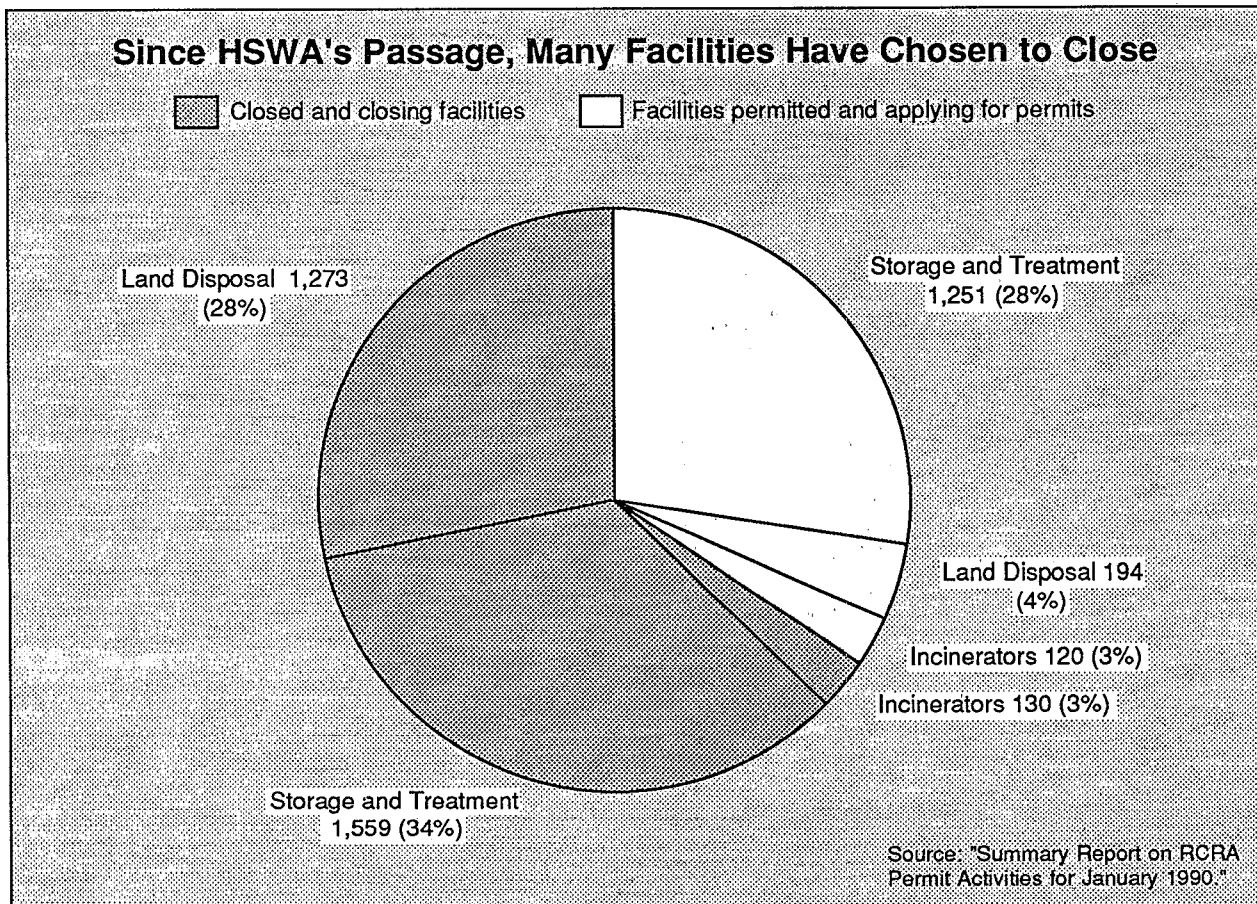
Dissatisfied with the lack of progress by 1984, Congress passed HSWA, which changed the permit program dramatically. The new law focused attention on the permit program, among other things, and included a number of provisions to accelerate the process. Most important, HSWA required all potential land disposal facility permittees to submit a complete Part B application by November 1985 or lose their interim status to operate. In addition, the law required EPA and the states to issue the different categories of permits by specified dates. The corrective action requirements for cleanup work were also a part of HSWA. The level of activity increased dramatically under the new law.

The universe of facilities facing the regulatory agencies was formidable, consisting of nearly 5,000 facilities. As EPA and the states promulgated additional regulations and the permitting process moved forward, large numbers of facilities decided not to continue hazardous waste management practices subject to RCRA permits. Figure 9 shows that approximately two-thirds of them chose closure over seeking a permit. This change in the regulated community is considered one of the major positive developments in improving protection of the environment from hazardous waste. Many smaller operators lacking the sophistication and resources to manage hazardous waste ceased storage, treatment, and disposal on their own.

The facilities going through closure were subjected to a review process resulting in more environmental benefits, particularly where corrective action requirements were imposed. Larger and more financially sound commercial facilities expanded their businesses dramatically. Although these corporations had problems of their own, particularly because of their rapid growth, the consensus is that the waste was being managed more effectively.

For the facilities pursuing permits, there were also major improvements. The application process itself required the facilities, for the first time, to take a comprehensive look at their hazardous waste management practices to determine how they could meet the new requirements. Based on this review,

FIGURE 9



the facilities proceeded to upgrade the many management practices necessary to qualify for permits. Thus, even in advance of receiving a permit, progress was achieved.

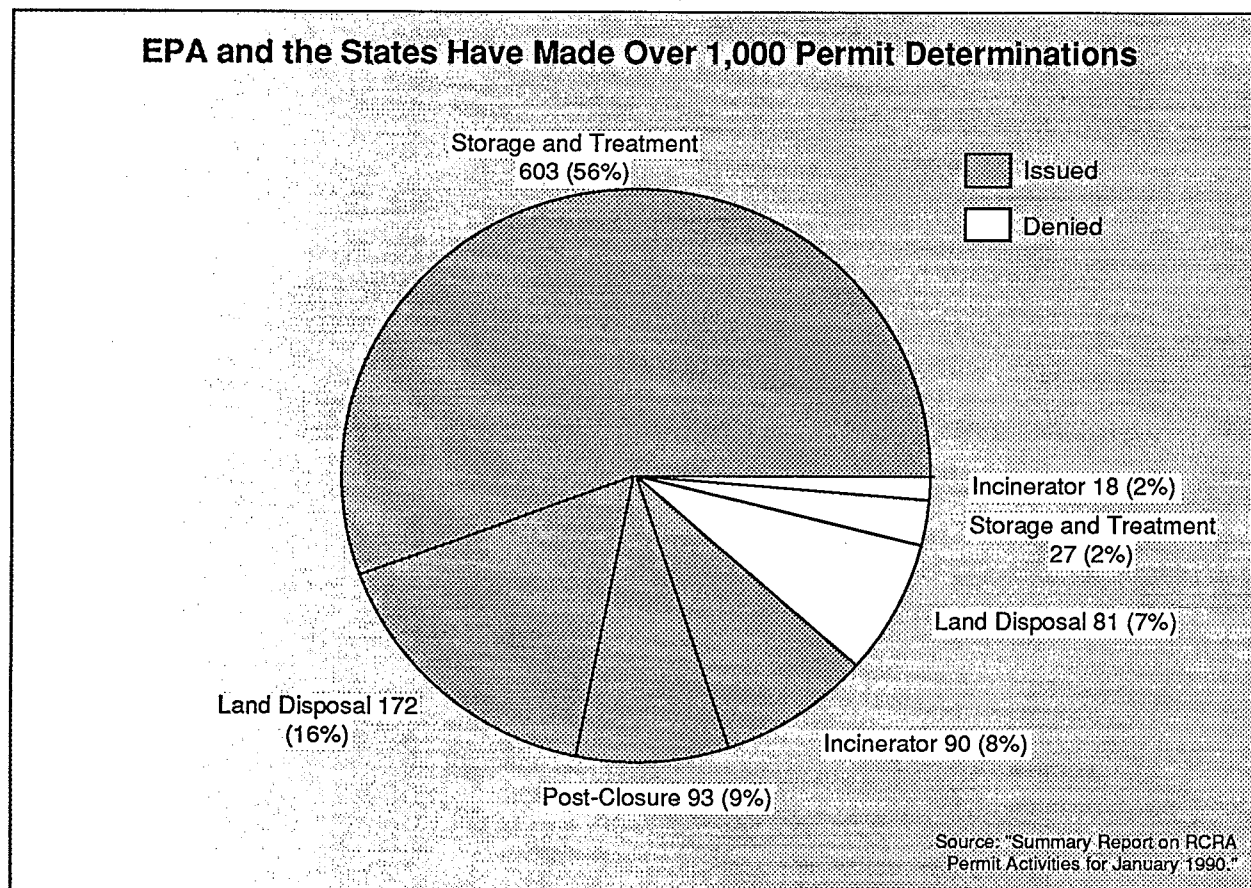
Making large numbers of permit determinations before the statutory deadlines is the most significant success of the program to date. Since the program began, EPA and the states have issued over 900 permits to the various types of facilities, as shown in Figure 10. For land disposal, 92% of the permits and denials were issued on time, and for incinerators, 93%. All of these existing facilities, except where permit appeals are pending or where there was a denial, are now under the strict waste management terms of RCRA permits. The permits serve as a continuing reference to plant personnel responsible for their work, and also can provide the agency field inspectors and enforcement staff with a reference for evaluating the performance of the facility. They form the basis for any enforcement action that may be necessary. They also represent the application of the many statutory and regulatory

requirements of RCRA to the specific conditions present at the plant. Permits clearly appear to be the best mechanism for providing all of these types of benefits.

In addition to issuing a large number of permits, the states and EPA have denied a significant number as well. As shown in Figure 10, over 10 percent of the final determinations have been denials. These denials in the RCRA program are significant. First, facilities that should not have been managing hazardous waste discontinued these operations. Second, denials show that the agencies have the institutional will to make difficult decisions about the future operations of a company. And finally, they provide environmental benefits and generally support the integrity of the program.

RECOMMENDATION: The states and EPA should continue their aggressive permit issuance program and seek ways to improve the efficiency of the process and the quality of the results, as discussed in the balance of this chapter.

FIGURE 10



Establishing a New Basis for Setting Priorities

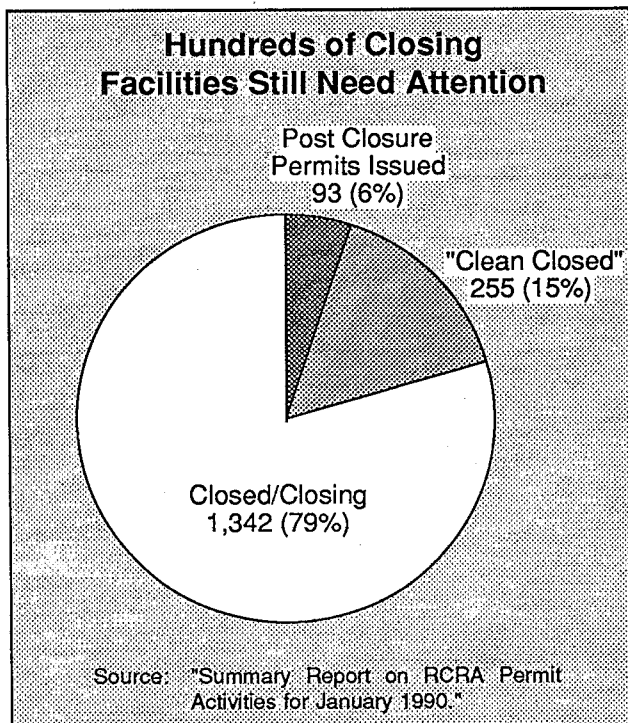
FINDING: The states and EPA are confronted by a myriad of conflicting priorities in the permitting program. They need a clear basis for making choices.

DISCUSSION: From the outset of the permitting program, the task of making final determinations for such a large universe has been overwhelming. The initial universe of almost 5,000 facilities represented a major workload that promised to keep a relatively small and inexperienced staff busy for many years. Even though a large number of facilities chose to close rather than to seek a permit, they still required attention in the form of reviewing closure plans and, in many cases, issuing post-closure permits for land disposal facilities (see Figure 11). The operating facilities and the closures represent a large universe, but they are not the whole picture. EPA has promulgated or will issue new regulations that will add a projected 1,820

more facilities to the universe, as shown in Table 4. If these trends continue, more expansion in the future is likely.

With this very large and growing universe, the states and EPA had to make choices about which actions to take first. There were many possibilities. First, there were the major categories of land disposal, incinerator, storage and treatment, and post-closure permits. Next, both existing facilities and new facilities were in the system; choices had to be made between continuing to issue new permits or maintaining the permits already issued, through permit modifications, reviews of reports, and other activities. Finally, it was necessary to consider the major areas of program emphasis of RCRA as a preventative program under permits for operating facilities or as a cleanup program under the corrective action requirements. Congress made the decision for the regulatory agencies by imposing the statutory deadlines. Clearly, land disposal facilities came first, and incinerators were to follow.

FIGURE 11



Now that nearly all the final operating permit determinations have been made on these types of facilities, the states and EPA must again make some difficult decisions. There are approximately 850 storage and treatment permits to be issued. Given current resource levels, it is not possible to take action on all of them by November 1992, particularly since the outstanding post-closure permits number about 1,600. This is principally due to the expanding workload brought on by the corrective action program.

TABLE 4

Hundreds of New Facilities May Be Added to the RCRA Universe		
Regulations		
<u>Controlling Facilities</u>		<u># of New Facilities</u>
Toxicity Characteristic		
Leaching Procedure		500
Boilers and Furnaces		500
Wood Preserving Listing		400
Mixed Waste		300
Mining Waste		100
Research, Development, and Demonstration		20
		1,820

Given the remaining storage and treatment and post-closure universes of nearly 2,500 facilities, it will take close to 4,200 work years of effort to issue all these permits, not even considering the corrective action portion of the permits. Obviously, adding the corrective action workload would increase that number significantly. Under the current budget levels, EPA has approximately 150 work years dedicated to permits, modifications, and closure. Under grants, the states have about 300 work years for these activities. EPA has estimated that it will take until 2004 to issue all remaining post-closure permits if existing funding levels remain constant. Even if *all* of these staff were devoted *full time* just to issuing permits—disregarding such demands as appeals, modifications, and closures—it would take over nine years to issue the remaining permits.

Faced with this situation, the state and federal permitting staffs have considered the possible priorities. There is a relatively even split among the people interviewed on setting priorities between post-closure and storage and treatment, new and existing facilities, new and existing permits, and prevention versus remediation. In contrast, there was almost unanimous agreement that there should be a new basis for deciding how to proceed.

One basis for proceeding could be the environmental significance of the action. Merely issuing the largest number of permits as quickly as possible before November 1992 will not be in the best interest of the public, the environment, or the agencies. Rather, there should be a process for selecting actions on the basis of what will bring the greatest environmental benefit. There is no agreement on exactly what this process should be, but there is some common understanding on guiding principles for it.

- First, it should be a flexible system that allows regions and states to make decisions based on the unique circumstances present at each facility.
- Second, it should not require large amounts of technical data, which may not be available and may be difficult to collect.
- Third, there should be national criteria or factors the regions and states should apply, but the criteria should be flexible enough to fit the case and to consider other factors that may be relevant. A uniform national system is unnecessary and undesirable. This is the case for permits and in a program such as HSWA corrective action, where federal cleanup funds are not an issue and the objective is to authorize

states for the program. The states should have the discretion to decide what is most important for their citizens. Some of the criteria that would be considered are the waste's quantity and degree of hazard, the facility's past performance, and its proximity to populated areas, drinking water supplies, ground water, surface water, wetlands, and estuaries. Again, a flexible approach to ranking and applying the criteria is the key to success. A Post-closure Permitting Strategy based on the above ideas appears in Appendix D.

RECOMMENDATIONS:

- EPA must recognize that it will not be able to issue all post-closure and storage and treatment permits and impose all corrective action requirements by the applicable deadlines.
- EPA and the states should form a task force to establish a management system that identifies the actions with the most environmental significance, and should proceed to take as many of these actions as possible.
 - The system should allow the states and the regions the maximum flexibility in applying national criteria or factors.
 - EPA and the states should make the criteria available to the states and regions within six months.
 - EPA should explain to Congress that statutory deadlines for permits cannot be met, but that by developing and implementing a management system, the most environmentally significant facilities will be addressed first.

Factors Affecting Permit Quality

Although permit quality is generally good, several factors have detracted from it. In the developmental stage, these factors include a high turnover rate among permit writers and the lack of, or untimely, training and guidance. Other factors affecting permit quality are the complexity of the regulations and the frequency with which they are changed. Enforceability is a measure that can be used to evaluate a final permit.

Permits Need Regular Evaluation

FINDING: Although EPA and the states have made over 1,000 permit determinations, the pressure to meet the deadlines for land disposal facilities and

incinerators has prevented any thorough examination of the permits.

DISCUSSION: Judging the quality of permits necessitates having some concept of what constitutes a quality permit. The permit should establish terms and conditions clearly and concisely to ensure that: (1) all waste management practices are protective of human health and the environment; (2) the facility knows what is expected of it; and (3) the inspectors and enforcement personnel can determine the compliance status of the facility. It should provide a framework to apply the intent of the regulations in a site-specific context. Consistent with statutory and regulatory requirements, the permit should advance the application of best available technologies in waste management, recognizing the unique characteristics of the wastes being managed. For corrective action in particular, it should require a thorough assessment of the contamination at the facility, the consideration of the human health and environmental impacts, a study of the corrective measures, and full implementation of the appropriate remedy. Industry believes a quality permit strikes a balance between environmental protection and the practicality of day-to-day waste management. Also, the issuance of a permit should elevate the level of public confidence about the operations of the facility, according to industry. Overriding factors to consider in deciding on permit quality are how well the permittees comply with the permits, how enforceable they are, and how effective they are in preventing and cleaning up environmental contamination.

Based on the general observations of permit writers and managers, regulated facilities, and the public, permit quality generally is good. However, this study did not include a thorough review of permit quality. EPA's Office of Solid Waste (OSW) is currently conducting an in-depth review of the quality of ground-water monitoring conditions and the use of compliance schedules in land disposal permits. With the review of six states in two regions completed and draft reports prepared, it appears that the quality of the conditions in these permits is good, with the exception of the permits in one state. The problems appear to be state-specific, rather than systemic to the program.

Thorough and regular reviews of permit quality are very important and should have a positive effect on the program. Representatives of EPA's water program cite their permit quality review effort to be a major factor in the success of their efforts. The RCRA program should learn from this experience.

Another indicator of success is how well the permits are withstanding the appeal process. With 112 permit appeals filed as of the end of 1989, 37% have been decided or settled. EPA's Chief Judicial Officer has upheld the regions' final permit decisions on most or all of the provisions in the permits in 17 of the 18 decided cases. Considering data from before 1986, the results are success in 24 of 28 decisions. This suggests that the permits are generally consistent with the statute and regulations and that permit writers have applied the requirements properly to the site-specific conditions present at facilities.

RECOMMENDATIONS:

- Complete the OSW permit quality review, and develop and implement recommendations for improving permit quality.
- The states and EPA should cooperatively develop a system for periodic permit review.

High Turnover and Inadequate Training Impede Progress

FINDING: Extensive turnover among permit writers and the lack of adequate training have hurt the quality and timeliness of permits.

DISCUSSION: Turnover among staff and the lack of a comprehensive training program are the most significant obstacles to producing quality permits. The high turnover rate is documented clearly in the Resources chapter and was confirmed in the permitting inquiry. Industry representatives, in particular, commented on the problems caused by the situation. Safety-Kleen, Inc., had four reviewers in 1.5 years, and E.I. duPont in Victoria, Texas, had five state permit writers in five years. At the Texas Water Commission, the turnover rate for permit writers is 30% per year, and the Louisiana Department of Environmental Quality had 70% turnover in the 20-person permits group for the 12-month period ending in June 1989. Also, the permit quality review group frequently had difficulty locating the permit writer. One regional office staff person stated it well by saying, "Assigning six permit writers and six hydrologists to a project between the time the application is submitted and the permit is drafted is absurd."

The turnover problem and the training problem are obviously very closely related. Permit writers do not have access to the appropriate training courses when and where they need them, and have difficulty finding time to take advantage of the

courses offered. Even with a low turnover rate, a complex and constantly changing program like RCRA requires a very sound training program. High turnover clearly exacerbates the situation. Many permit writers feel they have not been given the tools to do the job right.

RECOMMENDATIONS:

- Implement the recommendations in the Resources chapter that focus on reducing turnover and improving training.
- Simplify the RCRA regulations to facilitate their interpretation and implementation.
- Improve the timeliness, quality, and accessibility of guidance so staff have the right tools available to do a quality job, and so the rules are clearly defined up front, not after decisions are made.
- Improve the timeliness of the permit process so permit writers can achieve a sense of accomplishment more often.
- Standardize the mundane and routine aspects of the permit process so as to limit the participation of technical staff in administrative matters.
- Use expedited permitting methods for routine permits so that permit writers can perform more challenging technical work.
- Ensure staffing levels are adequate so specialists (e.g., hydrologists, chemists, and toxicologists) can practice their skills and not be forced to become generalists.

Regulations Are Complex and Change Frequently

FINDING: RCRA's complex and changing regulations make it difficult for the applicants, the public, and the permit writers to clearly understand permit requirements.

DISCUSSION: There are many examples of the complexity of the RCRA regulations and their changing nature. To begin, the definitions of "solid waste" and "hazardous waste" are exceedingly difficult to understand for even the most experienced staff. Along with the fundamental definition, the concept of recycling and how those types of facilities may avoid the requirements of RCRA have proven very difficult for the implementors. The land disposal restrictions and

the ground-water monitoring requirements are also examples of difficult regulations with which to work.

A regional office section chief described the problem well. "The RCRA regulations are constantly changing and growing. It is difficult to train inexperienced employees, who constitute the majority of RCRA personnel, in the basic program and the newly promulgated regulations. Many issues, because of their complexity, must be given to senior staff. Senior staff then become overloaded and burned out."

RECOMMENDATION: Implement the recommendations in the Regulations chapter, with particular emphasis on simplifying the regulations and using people with permitting and enforcement experience in the process.

Useful, Timely Guidance Is Lacking

FINDING: Guidance is often not available in a timely manner. When it is, often it is not in a form that is helpful, and it is difficult to locate and use.

DISCUSSION: Having good guidance available to people when they need it is extremely important, especially considering the number of major, complex regulations that the RCRA program has issued over the years. Unfortunately, there is frequently a significant gap between promulgation of the regulations and issuance of the guidance. With the pressure on regulation writers to issue new regulations, they apparently cannot publish guidance in a timely manner. As soon as they complete work on one regulation, they must begin work on the next, because of the deadlines imposed on the regulatory process and the limited resources to prepare regulations. One situation cited by a permit writer was the lack of land treatment guidance, which led to missing the deadline for issuing a permit for a land disposal facility.

In addition to the timeliness of the guidance, there is concern about the form of the guidance. In particular, the guidance is often quite long and difficult to follow. More concise guidance, with two- or three-page summaries, like Superfund is doing now, would be helpful.

Another problem has been the availability of the guidance. Although the guidance is sent out to the regions and the states when it is completed, often the people who need it most, such as the permit writers, are not able to obtain it. OSWER has a well-

organized directive system for the guidance; it is not being used, or people are unaware of it.

In a number of situations, the regions and the states have had to rely on guidance that comes out in advance of regulations. It is not the case that the guidance is early; rather, the regulations are late. This has been the situation with Subpart S regulations for corrective action, the incinerator regulations, and the Toxicity Characteristic Leaching Procedure rule. It puts the permit-issuing agencies in the difficult position of having to defend regulations even before they come out.

RECOMMENDATIONS:

- Issue more timely guidance in a form that is more useful to the people who use it most, and make it more accessible through the existing system or some revised, computerized system that is always kept up to date.
- Develop guidance in the form of more model permit conditions that could be used by permit writers in all regions and states, and that would be available through a computerized library system.
- Develop a training manual that would include a core curriculum of all guidance documents, and institutionalize the training system.
- Require that guidance for regulations be distributed within three months of promulgation and that training be initiated within six months.
- Create a headquarters clearinghouse for guidance and advice on permits.

Permit Enforceability Is Still Being Tested

FINDING: Enforceability is a key element in the quality of the permits, but there has not been enough experience to reach any conclusions about this aspect of the program.

DISCUSSION: The experience of compliance and enforcement personnel in permit follow-up activities can provide valuable information regarding the quality of permits. An inspector's ability to gather the necessary information to determine compliance with permit conditions is an indication of permit quality. Similarly, if the enforcement staff is able to develop an enforcement order for permit violations and, if necessary, present a successful case to an Administrative Law Judge, the permit has accomplished one of its important functions.

Although over 900 permits have been issued, EPA and the states have had limited experience enforcing permits. That is partly because many of the permits have been issued in the last two years, some permits are still in the appeal process, and so much emphasis has been placed on continuing to issue more permits.

Although compliance and enforcement experience has been limited, some permit writers report that inspectors have complained that they cannot determine if permit conditions are being met because permits are so long and complex that the inspectors are not sure what to look for.

RECOMMENDATIONS:

- EPA and the states should encourage more exchange between permit writers, inspectors, and enforcement personnel during the permit technical and administrative review stage.
- A communication system should be established for inspectors and enforcement staff to provide information to permit writers regarding their compliance and enforcement experience with permits.
- Permit writers should develop checklists for inspectors to follow when out in the field to make the information collection process more effective and easier.

Streamlining the Permitting Process

Even though the permit process is basically sound and produces generally good products, it takes too long and could use some improvements. The longest time, in the issuance of a permit decision, is consumed between the receipt of the application and public notice of the draft permit decision. Delays occurring after the permit decision involve appeals and modifications. The public participation and federal/state joint permitting aspects of the process were noted as needing improvement. Also, for some less complex facilities, a simplified permit process may be appropriate.

Permit Process Takes Too Long

FINDING: The process for issuing, appealing, and modifying permits is sound, but it is cumbersome and takes much too long in most cases.

DISCUSSION: The process for issuing permits is very comprehensive and allows for participation

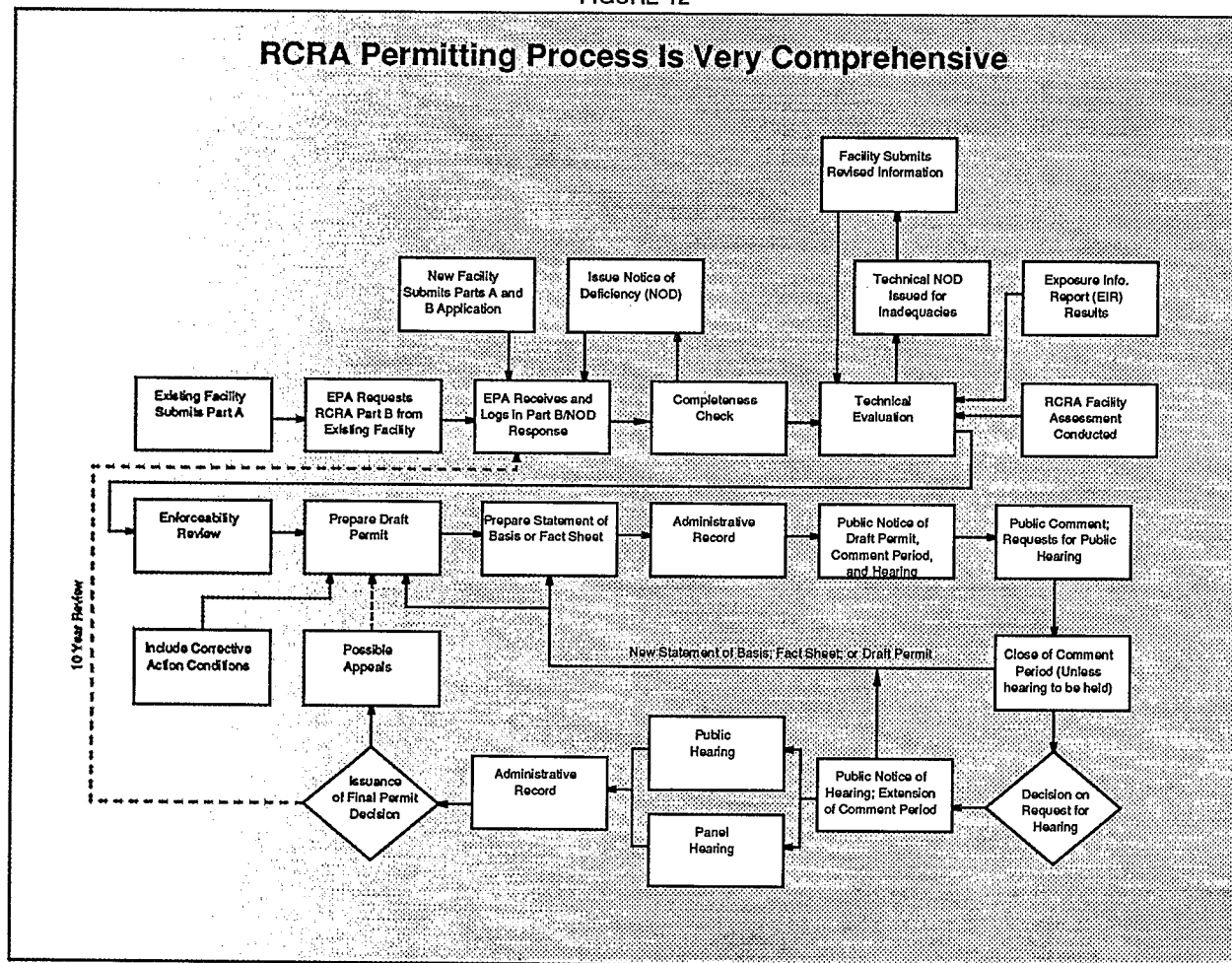
by the applicant and the public (see Figure 12). The process usually begins with a permit application "call-in" letter, where the issuing agency requires the facility to submit an application within a set period of time. Because the applications were required by statutory deadlines, they came in clusters, which contributed to delay. After the initial application, there are a number of exchanges between the applicant and the agency (EPA or the state) until the application is complete. The agency uses something called a notice of deficiency (NOD) when more material is required to proceed with the process. The application may be inadequate or incomplete, or both. If the applicant fails to provide the necessary information after a period of time, the agency may proceed with an enforcement action against the facility or proceed with denial of the permit.

Once the application is complete, the agency begins preparation of the draft permit. This is where the permit writer applies the complex regulations to the site-specific circumstances present at the facility. In addition to the draft permit itself, the agency prepares a fact sheet and a public notice of the intent to issue or deny the permit. The agency then publishes the notice in a newspaper and announces the proposal over the radio, and also provides notice of a public hearing, if requested. It is at this later stage where the public becomes involved in the process. The public may provide written comments and may present them at an open hearing.

Upon completion of the comment period, the permit writer reviews all the materials submitted and prepares a final determination, reflecting any changes considered appropriate in light of the comments. There is also a responsiveness summary, which explains how the comments were addressed. If there are significant changes, the agency may prepare a second public notice. Once the agency issues a final determination, the applicant or the public may seek administrative review of specific portions of the permit that were questioned during the comment period by filing a notice of appeal with the EPA Administrator. The appeal is reviewed and decided upon by the Administrator or EPA's judicial officer. Once the matter has been decided upon, the decision may be appealed to the U.S. Court of Appeals. The states also have appeal processes.

As Table 5 shows, the comprehensiveness of the permit process causes significant delays. The table does not even include the time for appeals, which

FIGURE 12



has averaged about 11 months for decided cases. Many undecided cases have been pending for longer than 11 months.

TABLE 5

Permit Process Causes Significant Delays		
Type of Permit	Issuance	Denial
Incinerator	4 1/2 yrs.	4 yrs.
Land Disposal	4 1/6 yrs.	3 1/3 yrs.
Storage	2 1/2 yrs.	2 2/3 yrs.
Treatment	2 3/4 yrs.	3 1/2 yrs.

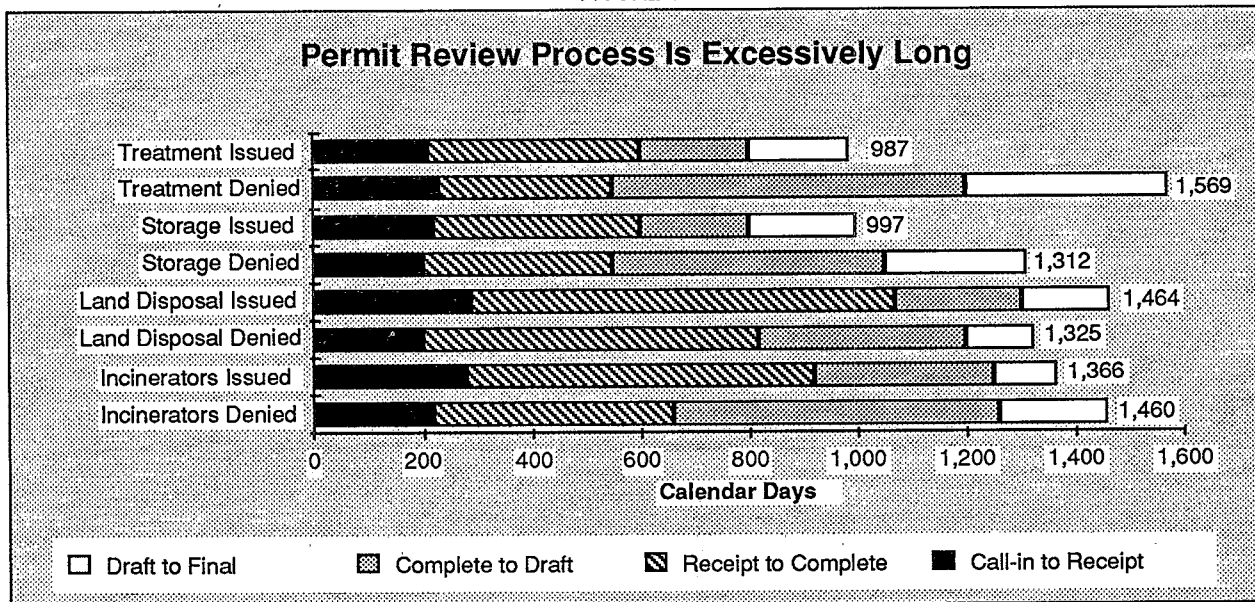
RECOMMENDATION: EPA and the states need to identify ways to make the permit process more efficient and timely, as suggested in this section.

Period Between Permit Application and Completion Is Too Long

FINDING: The permit application and review process needs to be shortened and improved significantly.

DISCUSSION: During the initial period of the permitting process, the permit writer reviews the application from both administrative and technical viewpoints. For all types of permits, this stage of the process takes an average of two to three years to get to the point of a complete application. (See Figure 13.) During this time, the applicant assembles all the information necessary to convince the permit writer that the facility will meet the design and performance requirements of the regulations and will comply with the conditions of the permit. The applicants say they have difficulty determining the type, amount, and format of the material to be submitted, resulting in incomplete, time-consuming, and untimely applications.

FIGURE 13



In addition, the permit writer may be facing several applications at the same time, and cannot deal with all of them simultaneously. Staff turnover is frequent, and training is limited. One regional office permit writer stated: "Administrative and technical review of the application takes the longest because of (1) staff turnover (each new person needs to re-review the application) and (2) the reluctance of inexperienced staff to approve documents, unless they think they are 100% correct."

Another problem has been the extensive back and forth between the agency and the applicant during the review process. For example, at Peoria Disposal in Illinois, eight or nine Notices of Deficiency were used. It appears that several are used in most cases. This may be because an applicant may honestly be uncertain as to what the agency wants. Or, it may be in an applicant's interest to delay the process and not be fully forthcoming with the necessary information. Or, a permit writer may not have a clear idea of what is necessary to make the final determination. Whatever the cause, the situation is creating major delays in the process.

An additional problem that arises frequently is a change in the regulations or the guidance during the application process. This forces the permit writer and the applicant to go back and review the situation to determine the effect of the change and to develop the additional information necessary to revise the permit. This is particularly aggravating and time consuming after the agency determines the application to be complete.

RECOMMENDATIONS:

- Provide more and better guidance to facilities before they file their application to increase the likelihood of a higher-quality submission. Develop a new model application, along with a checklist and format for submission.
- Require all permit writers to visit the regulated facility early in the process, preferably before application, and encourage meetings between the applicant and the permit writer. A formal pre-application meeting is particularly important.
- Establish a strict limit of two Notices of Deficiency before denial or enforcement for any given application, and provide training and guidance to staff on how to prepare better notices.
- Apply regulations to the facility that are in effect at the time an application is submitted, and allow for the application of regulations promulgated later on a discretionary basis. This would require a regulatory change. Conditions necessary to protect human health and the environment should be imposed under the "omnibus" authority of RCRA Section 3005(c)(3).
- Respond to late and incomplete Part B applications by moving quickly to enforcement or permit denial at a certain point in the process if it appears that the applicant is not proceeding

- in good faith, particularly in a post-closure situation.
- Update, reissue, and emphasize the September 9, 1983, enforcement guidance on responding to late and incomplete permit applications.

Public Participation Is Too Late in the Process

FINDING: The opportunity for public participation comes too late in the process and drags it out.

DISCUSSION: The formal opportunity for public participation occurs after the lengthy application process, when the draft permit and fact sheet are prepared and made available. The time from publication of the draft permit to issuance of the final determination is generally between four and five months, but tends to be longer where there are permit denials. In these situations, the average ranges from four to twelve months, reflecting the controversial nature of these proceedings.

Members of the public think they are brought into the process too late. Sometimes the permitting agency first finds out at this time that the public is sincerely interested. They point to the extensive time that passes between the initial call for the application and the public notice, and conclude that much has gone on between the agency and the applicant before they take part. They feel it is more difficult to make changes once the process is so far along.

In addition to the timing problem, representatives of the public said the application material and the permit itself are often too general. The fact sheets and the public hearings themselves appear to be acceptable, as there were no significant complaints raised.

In several situations, there has been extensive public participation in the process. Examples of significant public participation in two permits are shown in Appendix E.

RECOMMENDATIONS:

- EPA and the states should require applicants to give notice to the public at the time of initial application, to hold a public meeting shortly thereafter, and to allow the public to meet with the agency and the applicant during the application process. This would require a rule change, but should be sought voluntarily in the interim.

- The agencies should provide assistance to the public to help make sure the participation is as constructive as possible.

Permit Appeal Process Takes Too Long

FINDING: The appeal process takes too long and has an adverse environmental effect because the challenged provisions of the permits are stayed pending the outcome.

DISCUSSION: The appeal process provides a viable option to contest the outcome of the permitting process. Of the over 1,000 final permit determinations, the applicants and the public have challenged over 100 in the appeal process, or about 10 percent. The process itself seems to be sound, as no significant objections were raised about the procedures to be followed.

The problem with appeals is the length of time it takes from initial filing to resolution of the matter. For the cases decided to date, the average time from appeal to final order is about 11 months. The shortest case took four months, but a number of pending appeals have been on the docket for 18 to 24 months. Less than one-half of the permit appeals filed to date have been decided or settled.

There appear to be a number of sources of delay. First, the applicant generally has no incentive to move the process forward, as all appealed portions of the permit are stayed. Next, the permit writer and assigned attorney have their hands full dealing with additional permits to be issued. Consequently, it is not unusual for both sides to ask for extensions of time during the process. In addition, for the entire country, there is only one person assigned to deal with RCRA permit appeals on the Chief Judicial Officer's staff. Limited resources, and in particular legal resources, are clearly at the heart of the appeal process time problem.

The number of federal appeals increased dramatically from 1986 to 1989, with an eight-fold increase from 6 in 1986 to 48 in 1988, alone. There is a consistent pattern in the types of issues raised on appeal. The most common condition challenged, not surprisingly, is corrective action. This is a particularly difficult situation, because the Subpart S corrective action regulations are not promulgated. In 85% of the appeals, the challengers raised additional issues, such as general incinerator requirements, land disposal/minimum technology requirements, permit denials, ground-water

monitoring, and other provisions. Thus, the appeals are raising many significant issues, which obviously contribute to the delay.

RECOMMENDATIONS:

- Make more resources available to the Chief Judicial Officer so that decisions can be rendered in a more timely manner.
- Establish regional legal positions in the Offices of Regional Counsel, and increase permit staff.
- Promulgate the Subpart S rule promptly.

Revised Permit Modification Process Appears Successful

FINDING: The revised permit modification process has enhanced the permitting program and is generally working well. However, it may still be too early to tell how effective it will be.

DISCUSSION: EPA established new permit modification regulations in 1988 in response to concerns raised that the process for changing the permits to reflect new information or regulations was far too cumbersome, particularly for the less significant changes. The Permit Process Workgroup recommended this change in its 1986 report on the RCRA program.

There is continuing concern about the large number of modifications expected in the coming years. However, the general feeling is that the new rules should improve the situation. The primary advantage is the ability to categorize the different types of modifications by their magnitude and complexity, and to use more abbreviated procedures for the less complex changes. The rule also puts more of a burden on the permittee.

Despite these advantages, most states have not yet adopted the new rules. Some are concerned with the provision that certain modifications will be approved if the state fails to take action within a stated time frame. States are not required to adopt the new rule because it is viewed as less stringent than the old rule. There is some concern that the new rule will increase the workload for the regulatory agencies.

RECOMMENDATION: Encourage the states to adopt the revised permit modification rules by stressing the advantages for both the states and the regulated community.

Joint Permitting Process Has Some Snags

FINDING: The joint permitting process has led to closer cooperation between EPA and the states on specific permits, but it has also contributed to some delays, created some coordination problems, and caused some duplication of effort.

DISCUSSION: Most of the permits issued now are joint permits, because most of the states have authorization for the base RCRA program, but very few have HSWA authority. As a result, the states develop the base permits, and EPA develops the HSWA portions, including corrective action, land disposal restrictions, and waste minimization. Problems arise because of the need to have very close coordination between the two agencies. The permits are likely to proceed at a different pace, thereby having one part ready to issue before the other. One regional office permit writer explained that the states set the pace for permit issuance, and, at times, EPA gets "caught short" when the state is just about ready to issue a base permit without giving adequate notice to EPA. At that point, EPA must accelerate its process to get the permit out. The opposite happens, as well, when EPA may be ready to issue its part first. Then, EPA must wait for the state to issue the other part.

RECOMMENDATIONS:

- Accelerate the HSWA authorization process so that states are in a position to issue the full permits.
- In advance of formal authorization, encourage states to draft the HSWA portions of the permits for EPA to issue.
- Seek a statutory revision to allow for a separation of the corrective action portion of the permit from the base permit, in situations where such decoupling would be advantageous.

Certain Facilities Need Only Simple Permits

FINDING: Permitting certain types of facilities could be accomplished effectively, and without sacrificing human health or the environment, through a simplified and much less resource-intensive permit.

DISCUSSION: The very comprehensive process for issuing permits to complex land disposal and

incinerator facilities is clearly warranted. However, many of the storage facilities, in particular, do not justify the degree of review given to the others. Many storage facilities are relatively simple, and the conditions at one are quite similar to those at another. Thus, they could probably be regulated effectively without a site-specific permit, as long as EPA determines that human health and the environment would be protected.

Another category of facilities that could be addressed in a more abbreviated fashion is mobile treatment units. Their basic technology does not change as they move from one part of a state or country to another. What does change is the type of waste that is to be treated or disposed of, and the conditions around the facility where the unit will operate. Site-specific considerations obviously need to be taken into account, and the opportunity for public input to the process needs to be provided. However, it is not necessary to begin at the first step each time the unit is moved to a new location.

It is interesting to note that EPA has advanced similar concepts in the past. These proposals may be worth revisiting.

RECOMMENDATIONS: The following options could require statutory, regulatory, or policy changes:

- Allow permit-by-rule or class permits for on-site storage facilities. Handle corrective action through an order or some other mechanism.
- Allow national, regional, or statewide permits for mobile treatment units, with the necessary opportunity for local community input and site-specific considerations.
- Allow post-closure requirements (including monitoring, maintenance, financial assurance, and corrective action) to be imposed through a post-closure permit or an enforcement order or agreement. It is possible that a hybrid of the permitting/enforcement mechanism could be used. In addition, if post-closure requirements had been imposed through an enforcement action at the facility, a post-closure permit would not be necessary.

Incorporating Waste Minimization into Permits

FINDING: Although permits indirectly may lead some facilities to minimize waste for the sake of convenience and economic reasons, the very general

statutory requirements and the fact that large quantities of waste come from generators not required to have permits make permits a less suitable mechanism to bring about a significant amount of waste minimization.

DISCUSSION: In 1984, Congress added provisions in HSWA requiring generators to have waste minimization plans and treatment, storage, and disposal facilities that also generate waste to have permit conditions requiring such plans. Since those provisions were added to the law and included in the appropriate permits, little has been done to implement them. EPA published guidance in the *Federal Register* as to what should be included in a waste minimization plan. However, the permit conditions and the guidance are so general that it would be difficult to distinguish between an acceptable and an unacceptable plan. Likewise, there is no formal requirement to implement the plan.

As a result, EPA has been reluctant to proceed with any kind of enforcement action to deal with possible shortcomings in waste minimization programs. Some regions have provided literature on waste minimization during inspections, and others have asked permittees what they are doing under their plans. However, there is no comprehensive program as part of the permitting effort to implement waste minimization.

Much of the difficulty is that many of the generators of waste are not required to have permits because they are not treatment, storage, and disposal facilities. Thus, a large portion of the universe of generators is outside the scope of permits, making the permit an inappropriate vehicle for this purpose.

Another factor to consider is whether permits, in general, are a good vehicle for this purpose. The permits are designed generally for the hazardous waste handling procedures followed during the storage, treatment, and disposal parts of the process. This is quite different from regulating the actual manufacturing process when the waste is initially generated. If Congress or EPA determines that permits, or some other vehicle, should be used to require waste minimization, then it would be appropriate to include more restrictive provisions. Nevertheless, it still would be necessary to develop some other mechanism to cover the generators that do not have permits.

There are some advantages to expanding the waste minimization elements in permits. First, with the permit, the regulatory agency has some

leverage to require the facility to take waste minimization more seriously. Second, there are good reasons to deal with all elements of waste management within the permit, as they are all related in one way or another. And third, waste minimization is considered so important, that all available tools should be used to implement the concept. These and other reasons would form the basis for expanding waste minimization in the regulated community.

RECOMMENDATIONS:

- Strengthen and make more specific the regulatory provisions concerning waste minimization.
- Explore other concepts in addition to permitting, such as technical assistance, economic incentives, inspection of generators, and recognition programs, to expand waste minimization.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part outlines the various methods and tools used to collect and analyze data. It mentions the use of surveys, interviews, and focus groups to gather information from stakeholders. Additionally, it discusses the application of statistical software to process and interpret the collected data.

3. The third part describes the results of the data analysis. It highlights several key findings, including a significant increase in customer satisfaction levels over the past year. It also notes that there is a need for further training and development for staff in certain areas to improve overall performance.

4. The final part of the document provides recommendations based on the findings. It suggests implementing a new system for tracking customer feedback and establishing regular communication channels with clients. It also recommends investing in professional development programs for employees to enhance their skills and knowledge.



CHAPTER 6

Compliance and Enforcement: Better Targeting for Better Results

Introduction

An effective enforcement program must detect violations, compel their correction, ensure that compliance is achieved in a timely manner, and deter other violations. The RCRA enforcement program will obtain substantial voluntary compliance only if the regulated community perceives that there is a greater risk and cost in violating a requirement than in complying with it.

Methodology

In addition to extensive interviews, the Compliance and Enforcement (C&E) Subcommittee relied mainly on the following sources of information:

- Three analyses: (1) C&E activity data for the RCRA, the air, and the water programs; (2) Inspector General and General Accounting Office audits; and (3) Agency Operating Guidances (AOGs) for fiscal 1985-91, regional reviews, and state grant work plans.
- Various documents and studies concerning the RCRA C&E program specifically or environmental C&E in general, including: (1) EPA policy and guidance; (2) EPA strategic plans; and (3) EPA, industry, and environmental group issue/position papers.

Findings and Recommendations

The findings of the C&E Subcommittee address pollution prevention, clarifying objectives, maximizing deterrence, innovative enforcement tools, Administrative Law Judges' decisions, the

federal/state roles, regulations, personnel, resources, accountability systems, and measuring and communicating success.

Emphasizing Pollution Prevention

FINDING: Although the C&E program has enhanced pollution prevention, it needs to be more actively involved in promoting and requiring this activity and needs a strategy to do so.

DISCUSSION: Stringent regulatory standards coupled with a strong enforcement program are perhaps the greatest incentives to reduce waste. However, these incentives are not effective for dealing with undiscovered generators, since these generators are escaping the high cost of legal disposal under RCRA. Moreover, there is a need for C&E to play a greater role in promoting pollution prevention beyond that which is achieved through economic market forces.

For example, in fiscal 1991 EPA will begin a project to examine the role RCRA inspectors can play in promoting pollution prevention. The challenge is to make use of inspectors' frequent contact with the regulated communities (e.g., to disseminate information) without jeopardizing their role as enforcement officials charged with making compliance determinations.

RECOMMENDATIONS:

- Enforce the Biennial Report Requirement of Certification of Waste Reduction and the waste reduction requirements in permits (HSWA Sections 3002 and 3005) by placing more emphasis on verifying the receipt and the quality of the waste minimization reports. Take enforcement action against those who do not file or who file clearly erroneous reports.

- Incorporate pollution prevention strategies into the terms of enforcement case settlements. For example, require the company:
 - to install equipment over and above the statutory requirements to reduce waste;
 - to agree to conduct periodic waste audits;
 - to sponsor pollution prevention workshops for similar businesses; and
 - to conduct and submit a *comprehensive* analysis of the effect of pollution prevention on its operation, after which the company would decide on further steps.
- Encourage the incorporation of pollution prevention into the terms of enforcement case settlements through the Enforcement Response Policy, state grant work plans, and the Strategically Targeted Activities for Results System (STARS). (Settlements containing pollution prevention terms need to be fully consistent with the RCRA Civil Penalty Policy.)
- Continue to explore the appropriate role of inspectors in pollution prevention.
- Increase the RCRA C&E program's focus on undiscovered generators (i.e., non-notifiers).

Clarifying Objectives and Priorities

FINDING: The RCRA C&E program is spread too thin, given current resources and priorities. This substantially dilutes the program's effectiveness.

DISCUSSION: The objective of the RCRA C&E program is to ensure compliance with the regulations. However, many people interviewed see the RCRA C&E program as overextended, too broadly spread out, and without a common thread running throughout it. They feel that the program has had few special initiatives since the loss of interim status (LOIS) in 1985, in which EPA enforced the Section 3005(e) requirement that all land disposal facilities certify compliance with ground-water monitoring and other key regulations.

In fact, several additional areas have been targeted for special enforcement initiatives since LOIS. For example, before November 8, 1988 (the effective date of the RCRA Section 3005(j)(1) surface impoundment retrofitting requirement), EPA had in place a comprehensive and focused enforcement strategy that identified, targeted, and inspected facilities subject to RCRA requirements. The strategy was also designed to explain the requirements to the regulated community before

their effective date. Supported by this strategy, the statutory requirement resulted in the discontinued operation of more than 99 percent of the hazardous waste surface impoundments.

Another example of focused enforcement activity relates to implementation of the Land Disposal Restrictions (LDR) rules. Upon the effective date of each Congressionally mandated LDR rule, EPA had developed and was ready to implement an enforcement strategy that focused specifically upon the affected industries. These focused efforts have helped the regions and the states successfully identify and address LDR violations. In fact, approximately half of all newly commenced RCRA enforcement actions contain LDR claims.

In contrast to these focused initiatives, an example of overextension of the program is the implementation of the Enforcement Response Policy (ERP). The ERP, and EPA in general, have emphasized the initiation of formal enforcement actions (i.e., Administrative Orders and Judicial Actions) over the last several years. Issuing these actions has consumed considerable resources. In RCRA, virtually all "significant non-compliers" either have returned to compliance or have been issued a formal enforcement action. (See the flow chart on the C&E process in Figure 14.) However, recent program evaluation efforts indicate that follow-up to these formal actions may be suffering due to lack of focus and resources.

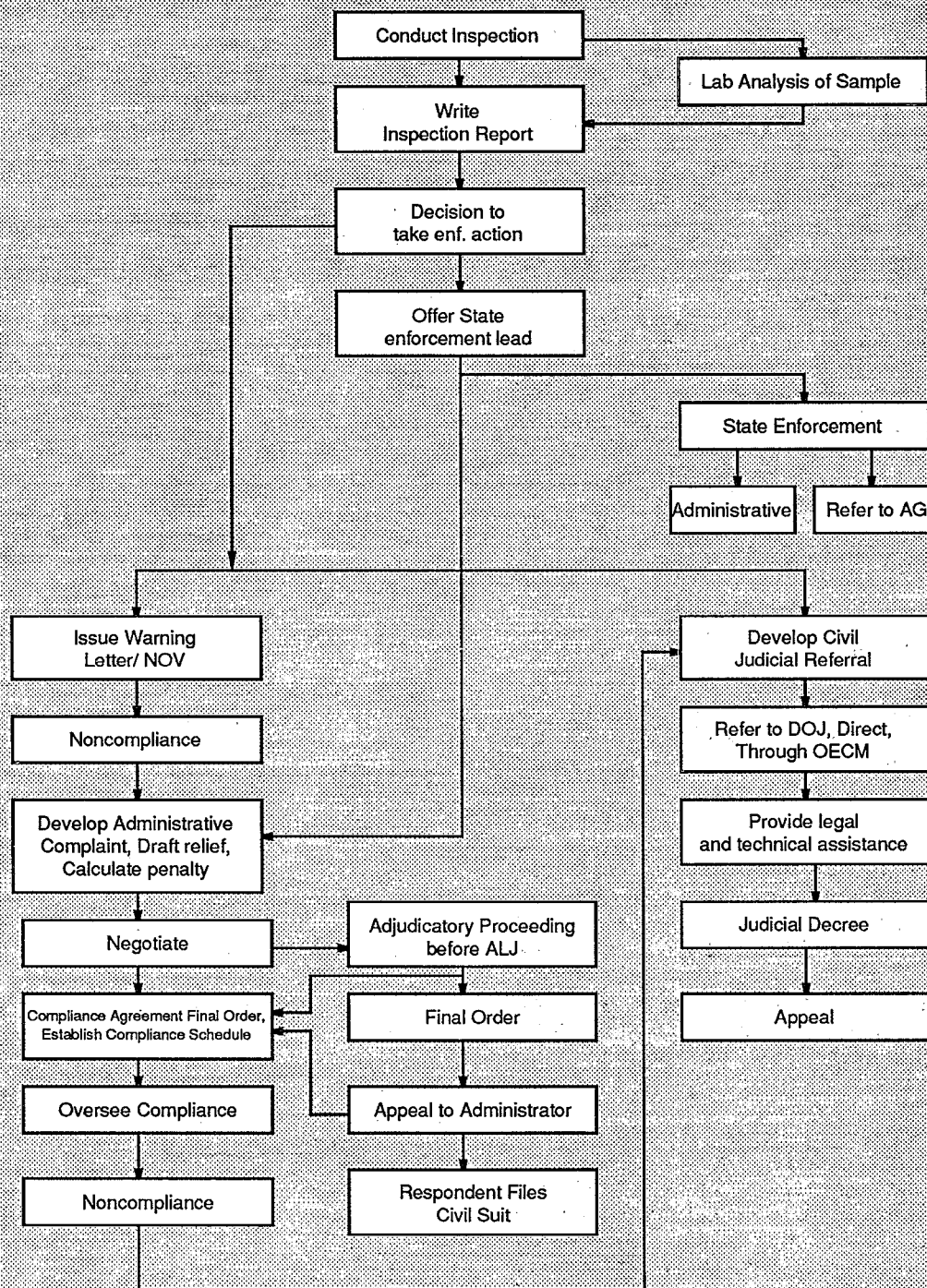
The tendency to overextend the program is due in part to the considerable external oversight of the RCRA program. While General Accounting Office (GAO) audits, Inspector General audits, and Congressional oversight have been beneficial in identifying areas that need attention, they also tend to place additional demands on the program without setting priorities for those demands. Overextension has increased with time, due to the rapid growth of wastes regulated under RCRA, while resources have remained relatively constant and priorities have increased. Furthermore, the RCRA planning process has not always given adequate consideration to available resources when setting priorities.

RECOMMENDATIONS:

- Target strategic initiatives to provide the greatest potential for bringing environmentally significant handlers into compliance with the RCRA laws and regulations and/or deterring RCRA handlers from violating the requirements. Consider waste volume and

FIGURE 14

Flow Chart of the Federal RCRA C&E Process



toxicity, specific segments of the regulated community (e.g., industry type, geographic area, company size), and specific types of regulatory requirements (e.g., LDR, Toxicity Characteristic Leaching Procedure, Biennial Report). Such initiatives may target any handler—from a large, commercial land disposal facility to a small-quantity generator.

- Change priorities in a measured way, so that major shifts are accompanied by adequate planning and availability of resources.

Increasing Focus on Generators and Non-Notifiers

FINDING: Substantially increased C&E presence is needed for generators and non-notifiers.

DISCUSSION: As a result of a number of factors, the C&E program has consistently made compliance monitoring and enforcement activities at treatment, storage, and disposal facilities (TSDs) a high priority. (See Appendix F.) Among these factors are the statutory requirements to inspect TSDs on a fixed schedule, the commitment to meet permit issuance and other deadlines, a strong Congressional and EPA emphasis on protection of ground water, a recognition that compliance by TSDs is essential to ensuring proper cradle-to-grave management of hazardous waste, and the influence of a number of GAO reports. For example, from 1981 to 1989, the General Accounting Office conducted at least 12 audits of the C&E program, which focused on activities relating to TSDs, and especially to land disposal facilities. Only one audit, in 1985, addressed generator non-compliance, non-notifiers (those who have failed to notify EPA that they are managing a regulated hazardous waste), and illegal hazardous waste disposal. This level of attention to TSDs been appropriate, because TSDs are frequently environmentally significant and because, even after years of focus, their compliance rates are relatively low. Low compliance rates (i.e., the percent of facilities in actual physical compliance as of their most recent inspection) have been a particular problem at land disposal facilities at least in part because many of their violations may take years to bring into compliance.

Because generators and non-notifiers have consistently been a low priority, only about one-third of all generators have had even one RCRA inspection, and proactive efforts to deter non-notifier activity have been limited. The consistent emphasis placed on TSDs, even those with good

compliance histories, has resulted in a comprehensive assessment of hazardous waste management activities of TSDs, without a similar understanding for generators and non-notifiers.

RECOMMENDATIONS: Significantly increase the program's emphasis on generators and non-notifiers, and maintain the current emphasis on TSDs. If resources cannot be augmented to accommodate this increased effort, scale back the TSD effort (e.g., to TSDs that are most "environmentally significant," that are out of compliance, or that have histories of non-compliance), and shift freed-up resources to focus on generators and non-notifiers. Since statutorily mandated inspections significantly limit EPA's ability to scale back on TSDs, EPA would need to ask Congress for relief.

Maximizing Deterrence Efforts

Penalties and Economic Sanctions Should Be Stepped Up

FINDING: The sanctions of the RCRA C&E program have not created a sufficiently strong deterrent impact.

DISCUSSION: The size of the regulated universe, the large number of regulatory requirements, and the relatively small amount of state and federal resources available for C&E activities require the states and EPA to obtain the maximum deterrent impact through their enforcement actions. While informal enforcement actions can be effective in bringing facilities into compliance (especially in cases where violations are simple or inexpensive to correct), such actions do not materially contribute to general, long-term deterrence. An enforcement program aimed only at bringing facilities into compliance and not at deterring future violations and encouraging voluntary compliance will be unsuccessful in the long run. (Of course, deterrence is only effective if the regulated community understands the requirements. The Regulations chapter of this report discusses options to simplify the very complex regulations and educate the regulated community.)

According to the interviews, the primary incentives to comply with RCRA are fear of criminal liability, fear of Superfund liability, and fear of damage to a company's reputation. Notably absent from this list is the fear of permit denial or of economic sanctions, such as penalties or contractor

debarment (whereby an owner/operator of a violating facility is not allowed to be U.S. government contractor). Large penalties are certainly important to creating a strong deterrent. A common perception is that the RCRA program often does not seek penalties in appropriate cases, or that the penalties proposed and assessed in the RCRA program are low, both when compared to the other major EPA media programs (air and water) and in terms of creating an effective deterrent. Historically, very few RCRA penalties of \$100,000 or more have been collected, and permit revocation or contractor debarment measures have been used infrequently. Although analysis indicates that, in fact, RCRA penalties compare quite favorably with those of other EPA programs (see Appendix G), the C&E Subcommittee agrees that, in general, larger penalties are needed.

While the exact size of the penalties necessary to achieve this deterrent effect cannot be established in a vacuum, the penalty must be large enough so as to negate the economic benefit of non-compliance.

RECOMMENDATIONS:

- Seek higher penalties in both administrative and judicial enforcement actions. These penalties must be appropriate for the violation, since the theoretical maximum penalty under RCRA may not be upheld by an Administrative Law Judge.
- Make greater use of economic sanctions other than monetary penalties, such as permit suspension/revocation, contractor suspension, and contractor debarment.

Enforcement Actions Must Be Targeted

FINDING: RCRA enforcement actions have not been targeted to maximize the deterrent impact.

DISCUSSION: Deterrence is maximized only when EPA or state enforcement actions reach into all areas of the regulated community. These areas can be divided in a number of ways, e.g., generator, treater, disposer; geographic location; company size; industry type; facility type; and the seriousness or frequency of violation. While EPA and the states have taken many types of enforcement actions against many types of facilities, they generally have not targeted these actions to specific areas or segments in order to maximize the impact of those actions. Instead, they have been largely ad hoc. Better targeting will increase the deterrent effect.

RECOMMENDATION: Strategically target enforcement efforts at specific segments of the regulated community or specific types of regulatory requirements. Generators and non-notifiers are especially good possibilities. Headquarters needs to orchestrate these initiatives with the regions, which, in turn, must work with the states.

Enforcement Actions Need Effective Publicity

FINDING: RCRA C&E publicity has not maximized deterrence.

DISCUSSION: Deterrence can be achieved only when EPA's and the states' enforcement activities are effectively publicized. Publicity about many EPA and state enforcement actions has not been targeted at the appropriate audience, or has not adequately explained the significance of the action.

RECOMMENDATION: Effectively publicize enforcement actions, ensuring that the proper audiences are made aware of the nature and environmental significance of the action. A closer working relationship with the media may be warranted. This may be achieved by simply encouraging more of an "open-door policy" with the media or by scheduling regular information exchange sessions (e.g., brown bag lunches or press conferences) with the media. More use of television and/or teleconferences has potential for better communications of C&E successes which, in turn, will increase deterrence.

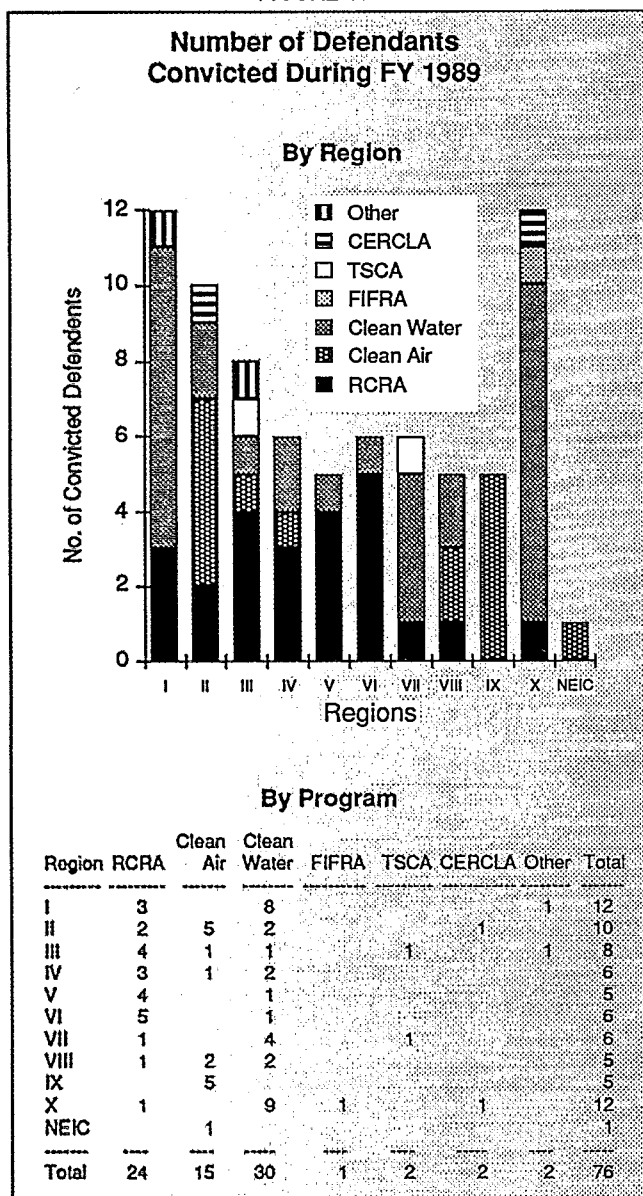
Judicial Enforcement Has Several Benefits

FINDING: Judicial enforcement (both criminal and civil) contributes significantly to deterrence, but the judicial enforcement process needs improvements.

DISCUSSION: Criminal enforcement, civil judicial enforcement, and administrative enforcement are all important components of a strong enforcement program, and each has a role to play in the enforcement process.

Criminal enforcement is viewed as the most effective tool for achieving deterrence. Most of the people interviewed think that the RCRA criminal enforcement program is more effective than EPA's criminal enforcement programs for other media. This high regard for the criminal enforcement program was a common perception among industry, environmental groups, and government

FIGURE 15



agencies. An examination of the accomplishments of the criminal enforcement program supports these widely held perceptions. (See Figure 15.)

While most RCRA cases are and will continue to be brought administratively, judicial enforcement is generally felt to send a stronger deterrent message. For example, judicial penalties tend to be higher than administrative penalties. (See Appendix G.) Judicial cases can also lend credibility to administrative enforcement when used to enforce compliance with administrative orders.

In addition, judicial enforcement is important because the contempt power of the court serves as a significant deterrent to violating the terms of an order. Such power may be particularly important in cases of recalcitrant facilities or facilities that may only come into compliance under threat of a court order (e.g., certain political subdivisions). Also, judicial actions are especially appropriate where court-ordered injunctive relief is needed.

Finally, judicial enforcement can help establish key legal precedents interpreting important provisions of the statute and regulations. Often, such interpretive matters cannot be resolved definitively by rulemaking. Judicial decisions, which carry greater weight and precedential value than administrative decisions, can help resolve these matters in a manner favorable to EPA.

Judicial enforcement cases should be handled in a timely fashion in order to maximize their deterrent impact. In some cases, the time between initial referral of cases to the Department of Justice (DOJ) and the filing of the cases is longer than desired. These and other delays in the enforcement process may detract from the impact of a potential enforcement case. Delays may occur due to lack of sufficient resources and resulting prioritization, the complex and subjective nature of RCRA, cases that are not fully documented at the time of referral, and sometimes insufficient communication between EPA and DOJ.

Administrative enforcement is also an integral part of the enforcement process and is particularly important in the RCRA program, given the strong administrative authorities granted EPA under the statute. It allows a larger volume of cases to be undertaken, since administrative actions often are less resource-intensive than judicial actions. Many, if not most, violators can be addressed efficiently via the issuance of an administrative order. In addition, the statute authorizes EPA to impose large administrative penalties.

In addition to bringing administrative cases, it is important that the RCRA program bring a significant number of judicial cases, both criminal and civil. We expect that decisions as to whether a particular case is appropriate for administrative, civil judicial, or criminal referral will continue to be based on the facts and requirements of an individual case.

RECOMMENDATIONS:

- Aggressively pursue judicial enforcement actions (both civil and criminal) in appropriate

cases. Such cases may include cases selected for targeted initiatives, cases against particularly egregious or repeat violators or violators of administrative agreements, cases that seek particularly large penalties, cases where court-supervised injunctive relief is needed, cases that may establish useful legal precedents interpreting key aspects of the regulations or statute, and cases with a multimedia enforcement approach. The regions have found such judicial actions to be resource-intensive. At the same time, EPA recognizes the benefits such cases may have both for the individual case and for the program as a whole.

- Improve coordination and communication with DOJ.
 - Meet regularly with DOJ to discuss priorities and workload.
 - Encourage DOJ attorneys to take RCRA training.
 - Make sure that only appropriate cases are referred, and coordinate with DOJ before referral where practicable.

Inconsistent Interpretation of "High-Priority Violator" Has Hurt Deterrence

FINDING: Inconsistent classification of "high-priority violators"¹ undermines deterrence.

DISCUSSION: There is a concern that the current definition of "high-priority violator" has been inconsistently interpreted and applied by the regions and the states. Such inconsistency has a substantial effect on the program's credibility and, therefore, has undermined deterrence. The previous trigger for formal enforcement against significant non-compliers was a land disposal facility with a Class I (i.e., most serious) violation of the groundwater monitoring, financial responsibility, or closure/post-closure requirements. The definition was later amended to add a significant violation of a schedule or corrective action requirement in an order or permit. This structured system allowed ready identification and assignment of significant non-complier status. However, this prescriptive definition lead both to some enforcement actions for which priorities were improperly set and to increased friction between some regions and states.

The definition provided in the revised Enforcement Response Policy (effective October 1, 1988) is more flexible to cover a wider range of facilities and violation types.

RECOMMENDATIONS: Since the revised definition of a "high-priority violator" is relatively new, continue to observe implementation of the Enforcement Response Policy by EPA and the states to determine whether RCRA violators are being classified consistently. If the inconsistency in classifying significant violators continues, possible options include:

- redefining the term "high-priority violator" to make it more objective, or
- increasing oversight and evaluation until greater consistency is achieved.

Using Innovative C&E Tools

FINDING: The RCRA program has not explored and used innovative compliance monitoring and enforcement tools and techniques as much as it should.

DISCUSSION: To date, the RCRA program has relied primarily on traditional compliance monitoring and enforcement tools and techniques, which may not be the most efficient way of evaluating the compliance status of facilities. The program relies almost exclusively on site inspections and quite infrequently on self-reporting or certifications (one exception was the "loss of interim status" requirement). Because of resource limitations, this approach results in the inspection of only a small percentage of the regulated universe in a given year. (See the Resources chapter of this report.) This, in turn, limits the number of facilities that might be subject to enforcement action, thus providing little incentive for facilities to maintain compliance.

Another example is that the RCRA program focuses primarily on the negative or "stick" approach to ensuring compliance. That is, in most situations there is neither an up-front effort to ensure that the regulated community understands RCRA nor rewards for good compliance records. Rather, the approach is simply to monitor the

¹ These are violators who, under the Enforcement Response Policy, must be addressed through formal enforcement actions that carry economic sanctions.

situation and impose sanctions (usually monetary) when violations are found.

RECOMMENDATIONS:

- Institute a program of self-certification and self-reporting to supplement the inspection program. Expand 40 CFR Part 270.30 (which requires reporting of permit non-compliance) to include routine (say annual) certification for interim status as well as permitted facilities. One option is to allow certification for administrative requirements to be made by the facility owner/operator and for technical requirements to be made by a registered professional engineer. Failure to certify would be a violation.
- Use economic sanctions, such as permit suspension or revocation and contractor suspension or debarment, more frequently in the proper circumstances.
- Develop model orders to streamline EPA-initiated and even some state-initiated actions. This would be useful for the person drafting the action, and would speed up the review process, since reviewers would already be familiar with the models.
- Encourage the use of field citations at both the state and the federal levels to enable inspectors to issue small fines and orders immediately when they identify relatively minor violations. Field citations would be especially effective in establishing a greatly expanded enforcement presence at generator facilities.
 - Help more states implement field citations by investigating and documenting the details of existing state programs using field citations and by working with other states to develop similar abilities.
 - Minimize appeals in the citation program, and/or provide a simple, expedited appeal procedure. Without this, the resource savings of a field citation program may be lost.
- Explore and implement positive approaches to encouraging compliance by the regulated community, including simplifying the regulations, providing technical assistance and educational outreach, and using the media to provide positive publicity for environmentally good corporate citizens.

Streamlining the ALJ Decision Process

FINDING: Strains on the administrative hearing process are causing long delays in some cases.

DISCUSSION: The complexity of RCRA cases, the significant case load carried by Administrative Law Judges (ALJs), and delays inherent in affording due process to parties to an adjudicatory process are some of the factors that can contribute to delays in obtaining timely administrative hearing decisions. These delays were cited by many regions as a significant source of frustration in achieving timely enforcement and compliance. As the RCRA program seeks higher administrative penalties (as recommended earlier in this chapter), it can be expected that fewer cases will be able to be satisfactorily negotiated, resulting in an even higher percentage of cases going to hearing and further strains on the system. A small number of ALJs and the Chief Judicial Officer must handle all of EPA's hearings, and RCRA must compete with other cases in the docket, some of which are subject to statutory or regulatory deadlines.

RECOMMENDATIONS: Recognize that administrative hearings are part of the critical path for some enforcement actions. Match ALJ resources to the case load being generated.

Reducing the Subjectivity and Complexity of the RCRA Regulations

FINDING: The large number and complexity of the RCRA regulations make the compliance and enforcement process very difficult for both the regulators and the regulated community.

DISCUSSION: EPA and the states often run into unexpected problems with the regulations that undermine and delay the enforcement process. As shown by the case studies on the definition of "tank" highlighted in this chapter, the excessive ambiguity of some regulations becomes apparent when efforts are made to enforce them.

The 40 CFR Part 261 definition of "solid waste" and "hazardous waste" has caused enforcement problems due to its complexity. The Land Disposal Restrictions (LDRs) and the numerous exclusions and exemptions throughout 40 CFR Part 261 were also cited in interviews as extremely difficult to understand and enforce due to their complexity.

DEFINITION OF "TANK"

The 40 CFR 260.10 definition of a "tank" is as follows: "Tank means a stationary device, designed to contain an accumulation of hazardous waste, which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support."

On the surface, the definition of a tank would appear to be quite straightforward and objective. However, the 40 CFR 260.10 definition has caused numerous problems for the RCRA enforcement program because it uses subjective terms, such as "primarily" and "provide structural support." It is usually to a facility's advantage to try to classify a waste pile or a surface impoundment as a tank. This is because: (1) tanks were not included in the November 8, 1985, loss of interim status certification requirements; and (2) the 40 CFR 265.1(c)(10) and 270.1(c)(2)(v) wastewater treatment unit exemption requires that treatment take place in a tank. Two of the most notable enforcement cases are described below.

Brown Wood Preserving Company Brownville, Alabama

An EPA RCRA administrative enforcement action was filed on March 31, 1984, charging that Brown Wood failed to meet the ground-water monitoring, closure, and financial responsibility interim-status standards for several units at its facility, including a sand filter bed. EPA claimed that the sand filter bed was a surface impoundment. Brown Wood argued that the bed, which had four wood sides and a clay bottom, met the regulatory definition of a "tank" and, thus, was exempt from the interim-status standards as a wastewater treatment unit. An administrative hearing was subsequently held, and the ALJ issued his initial decision on May 30, 1986. In his decision, he dismissed EPA's complaint and, among other items, found that the sand filter bed met the definition of a "tank." EPA filed an appeal with the Administrator on July 9, 1986. EPA's chief judicial officer issued a decision on May 3, 1989, which reversed the ALJ's initial decision on the tank question. The decision stated that because the sand filter bed lacked non-earthen structural support for its floor, this fact precluded it from meeting the definition of "tank." However, since Brown Wood stopped using the sand filter bed in 1984 (and based on other factors), the Chief Judicial Officer did not order any penalty or injunctive relief.

Reilly Tar and Chemical Corporation Cleveland, Ohio

An EPA civil enforcement action was filed on April 21, 1987, charging that Reilly Tar violated RCRA by continuing to use a waste pile after November 8, 1985, which EPA alleged had lost its interim status. Reilly Tar filed a motion for summary judgment, requesting the complaint be dismissed because the alleged waste pile was really a tank. The waste pile was located on a box-like structure of welded steel plates supported three feet above grade by concrete piers. There was a loose-fitting steel gate. A roof and wooden walls surrounded the structure. The height of the waste pile usually exceeded the height of the steel plates forming the sides. On October 14, 1988, the Court dismissed the EPA complaint with prejudice. Because the bottom and lower sides of the structure were made of non-earthen materials and because it was a stationary device, the Court found that the structure met the definition of "tank." The Court was not sympathetic to EPA's arguments that the loose gate did not constitute a fourth side or that the height of the pile exceeded the height of the steel walls. Because Reilly Tar agreed to close the unit as a tank, EPA did not appeal the Court's ruling; however, EPA obtained no penalties.

The numerous capacity-based time extensions of the LDRs made it difficult to determine whether the LDRs applied to a certain hazardous waste. The number and size of RCRA regulations have grown rapidly. The RCRA regulations first appeared in the July 1, 1981, edition of the Code of Federal Regulations. At that time, 40 CFR Parts 260 through 268 covered 209 pages. In the July 1, 1989, edition, these same parts required 509 pages—an increase of almost 150%.

There is a definite reluctance to enforce some of the hazardous waste regulations when no feasible remedy may be available to the regulated community. One example is where a waste is restricted from land disposal unless it has been treated, yet there is insufficient treatment capacity, even after the expiration of all available capacity extensions. (See the Regulations chapter for additional discussion on enforcement of the regulations.)

RECOMMENDATIONS:

- Write regulations with objective standards to the maximum extent possible.
- Review regulations for internal consistency, starting with the regulations that will have the most important environmental effects.
- Spend less time and attention trying to implement requirements that are beyond our control or impossible to implement.
- Incorporate fewer variances, extensions, and exclusions into the rules.

Clarifying Federal and State Roles and Responsibilities

FINDING: The roles and responsibilities of EPA and the states in the RCRA enforcement process are not clear.

DISCUSSION: As discussed more thoroughly in the State/Federal Alliance chapter of this report, significant frustration was expressed over the lack of clear definition of the respective roles and responsibilities of EPA and the states in the RCRA program. While no enforcement or compliance task should be exclusively reserved for either EPA or the states (except as may be dictated by law—e.g., HSWA enforcement), many people felt that the roles are poorly defined with respect to

compliance monitoring, enforcement responsibilities, and EPA's oversight activities.

Although administrative penalties can be a very effective enforcement tool, a number of states do not have such authority. These states can seek penalties only through the judicial process involving the Attorney General's office, and they tend to either backlog cases awaiting action or decide to handle them through informal, non-penalty actions. In either case, a significant deterrent impact is lost.

RECOMMENDATIONS:

- Recognize the necessity of some EPA enforcement in authorized states, without usurping state authorities or pretending that EPA can replace the authorized state as the primary enforcer. A number of situations are appropriate for federal enforcement. These include enforcement of requirements for which the state is not authorized; enforcement in situations necessary to maintain national consistency, such as when an individual state is imposing less stringent requirements or enforcing significantly less stringently than required by state-EPA agreements; enforcement in situations that complement state enforcement; and enforcement in situations that involve uniquely federal interests or in cases that might set important national precedents.
- Bring state Attorney General (AG) offices fully into the goal-setting and grant work-planning process. This is particularly important in states that do not have administrative penalty authority, where the AG's participation will be required in all cases appropriate for penalty assessment.
- Avoid duplication of state and federal efforts by sharing work plans and strategies.
- Propose a requirement that authorized states adopt administrative penalty authority in order to obtain formal comment on the issue.

Expanding Training Opportunities and Support Services

C&E Staff Need Extensive Training

FINDING: C&E suffers from the same resource problems as does the rest of the RCRA program. These problems include inadequate training, high staff turnover, and salary and benefits that are not

competitive with private industry or Superfund. (See the Resources chapter of this report.)

DISCUSSION: The ultimate success of the RCRA C&E program will be determined by the capabilities and skills of its work force. Inspector training is critical to the C&E program. In November 1987, a GAO audit of the RCRA inspection program cited lack of training as a major factor contributing to poor inspector performance. Training is particularly critical, given the high rates of turnover among RCRA inspectors. (See Table 6.)

TABLE 6

RCRA Inspector Turnover Rates Are High

	FY 85	FY 87
State	17%	19%
EPA	35%	26%

In addition, an internal EPA survey found that the average RCRA inspector had only two years of experience. Other results of this survey are shown in Figure 16. Since then, the RCRA C&E training program has been considerably strengthened. All staff responsible for conducting inspections must now meet the training requirements of EPA Order 3500.1, which was issued in June 1988. Also in June 1988, EPA published the Inspector Enhancement Strategy. This strategy established minimum requirements for RCRA-specific inspector training, listed available and upcoming C&E guidance documents, and outlined a policy for inspection oversight. In addition, many new training courses have been developed.

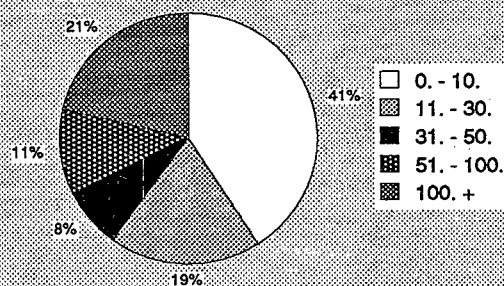
Staff in the RCRA C&E program spend an average of one month a year in formal training courses, in addition to individual reading and on-the-job training. Below is a list of other types of training a typical compliance and enforcement staff person needs to do his or her job effectively:

- RCRA orientation;
- regulations training (e.g., land ban, ground-water monitoring);
- case development;
- criminal investigations;
- negotiation skills;

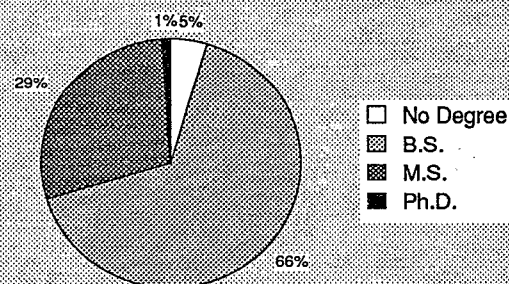
FIGURE 16

A Nationwide RCRA Inspector Profile

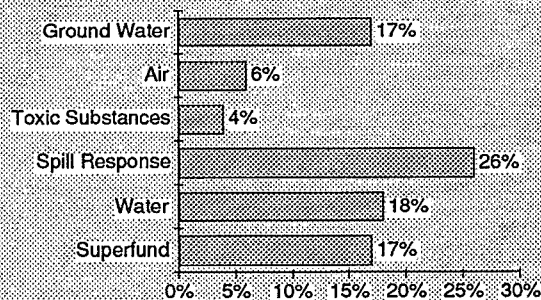
Percentage of Inspectors Having Performed "X" Number of Inspections



Educational Background of RCRA Inspectors



Inspectors Currently Performing Inspections Under Other Programs



- penalty calculation and mitigation, including using BEN (economic benefit model) and ABEL (ability-to-pay model);
- contract management;
- sampling and chain-of-custody procedures;
- technical skills (ground water, chemistry); and
- word processing and other computer skills.

Inspector Turnover Rate Is High

In organizations where the inspection and enforcement functions are conducted by the same person, there is often higher job satisfaction, resulting in lower turnover. This combination of functions has also allowed some organizations to develop higher grade levels for non-supervisory staff. The RCRA Inspector Enhancement Strategy discusses initiatives to encourage RCRA inspectors to remain in the enforcement program. These include: technical career ladders that recognize exceptional abilities and performance, and provision of opportunities for advancement outside the supervisory role.

RECOMMENDATIONS:

- To the maximum extent possible, plan and budget training at the beginning of each year. The Office of Solid Waste and the Office of Waste Programs Enforcement (OWPE) should initiate the planning process by jointly disseminating the schedule and location of training that headquarters will provide. The regions and the states should then develop their specific training plans.
- In addition to continuing its ongoing efforts, OWPE should evaluate the expansion of the EPA Inspector Institute.
- Pursue other ways to recognize the accomplishments of the C&E staff, such as awards (monetary and symbolic) or a national certification program.
- Be realistic with expectations, and discuss them frequently with staff to combat "burnout."
- Encourage (and allow time for) C&E staff to participate in the regulatory development process to foster increased staff commitment and a more practical regulatory scheme.

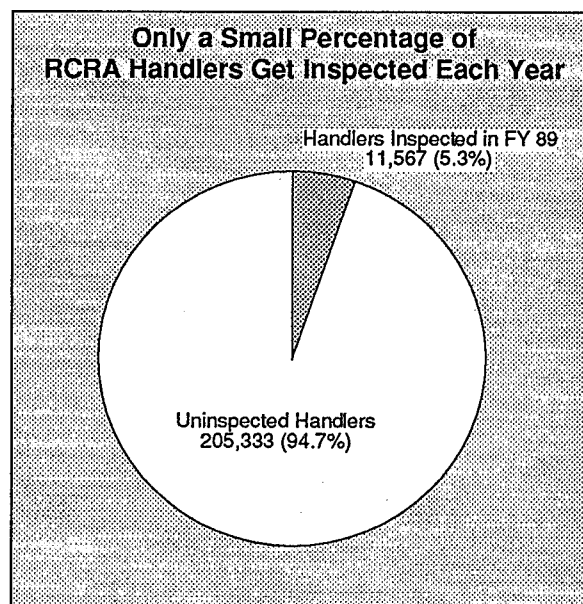
Current Resources Are Insufficient to Meet Program Expectations

FINDING: Given the current expectations for the program, the collective resources (including legal support) of EPA and the states are not sufficient.

DISCUSSION: As shown in Figure 17, the RCRA C&E program can only inspect a fraction of the total regulated community (particularly generators and transporters) each year. For this reason, EPA and the states spend considerable time setting priorities. EPA defines the program's priorities in the Agency Operating Guidance and in numerous policies and strategies, such as the Enforcement Response Policy and strategic plans. Typically, EPA's priorities, policies, and strategies do not fully consider available resources. Consequently, accomplishments often fall short of expectations.

Legal support comes from state Offices of Attorney General (AGs), local district attorneys, EPA's Office of Enforcement (OE), EPA Offices of Regional Counsel (ORC), and the Department of Justice (DOJ). Among the state AGs, there are significant differences in available resources,

FIGURE 17



working relationships, and the priority RCRA cases are given. Among the EPA regional offices, the study found differences in the number of judicial enforcement cases. All regional program offices interviewed expressed dissatisfaction with the level of resources available in ORC. Resources for RCRA enforcement are distributed to ORC and the program offices according to different priorities. For example, judicial referrals are weighted heavily in ORC resource distribution, but most enforcement is done administratively.

Because many states are only able to seek penalties through a judicial process (i.e., they lack administrative penalty authority), AGs are an important "player" in the RCRA enforcement program. However, these offices have not been adequately factored into program planning activities. Among the results of this lack of integration is that AG resources often are not available to pursue judicial penalty cases, and that the overall quality of enforcement suffers. Furthermore, other environmental programs (i.e., Superfund, water) force RCRA to compete for limited attorney resources. The latter problem is accentuated at DOJ and AG offices, where non-environmental programs compete for resources as well.

RECOMMENDATIONS:

- The Agency Operating Guidance and the Strategic Plan should set expectations within a reasonable range of the available resources.
- EPA and the states should investigate ways to facilitate local government involvement in the compliance and enforcement program.
- The AGs and DOJ should be brought into the goal-setting process to ensure their later support for the referred cases. Ensure that enforcement cases referred to state AGs and DOJ are consistent with the jointly developed goals of the RCRA compliance and enforcement program.
- Budgets and resource distribution methodologies for ORC/OE and RCRA should be developed in concert.
- EPA should encourage states to involve AGs in the grant work planning process.
- DOJ should participate in training or provide guidance to regional staff on judicial case development.

Measuring and Communicating Success

Accountability System Is Too Narrow

FINDING: The RCRA C&E program is widely perceived as being driven by an inadequate "bean counting" system that fails to provide appropriate incentives for pursuing high-quality enforcement actions. In addition, EPA has relied too heavily on its accountability systems, which are necessarily narrow in scope, as the sole measure of program success.

DISCUSSION: It is critical to establish accountability and feedback mechanisms to gauge program performance and relative success. The national accountability system is the Strategically Targeted Activities for Results System (STARS), which replaced the Strategic Planning and Management Systems (SPMS). STARS compares regional outputs to objectives and activity goals identified in the Agency Operating Guidance. (State activity is accounted for in STARS as a subset of overall regional accomplishments.)

For enforcement, EPA and the states have identified a core group of management indicators to track progress. These include inspections, the identification and resolution of significant non-compliance, numbers of civil and criminal case referrals, and administrative orders. At the beginning of each fiscal year, the regions and states review the known universe of significant non-compliers and establish joint commitments to address them during the year. Joint commitments for other activities are also established at this time. (See Appendix H for a summary of EPA and state progress in resolving problems with significant non-compliers over the past several years in the air, water, and RCRA programs.) The regions measure state performance against commitments in the grant work plan. Quality considerations are established in the National Criteria for a Quality Hazardous Waste Management Program and are reflected in state and regional program reviews, but are not major factors in measuring success nationally.

STARS has historically been used as the primary measure of the success of regional and state performance. This leads to the perception most commonly espoused in the interviews that RCRA is a "bean count" program that does not adequately measure broad program success. Even the SPMS

measures designed to address quality², such as timeliness and appropriateness of enforcement actions, are viewed as "beans" in a numbers game. For example, an enforcement action regarding a simple paperwork violation where no environmental harm has occurred (e.g., a deficient 40 C.F.R. Section 268.7 land disposal restrictions notice) may be as significant in terms of "beans earned" as a more environmentally protective and resource-intensive enforcement action involving ground-water monitoring violations. Such accountability systems, which are primarily perceived as numbers games, can create unnecessary friction between EPA and the states.

Table 7 shows enforcement activity for all handlers and for selected years. The table indicates that about 70% of enforcement actions are informal.

TABLE 7

Most Enforcement Actions Are Informal			
Fiscal Year	Informal	Formal	Total
1985	4,029 (73%)	1,473 (27%)	5,502
1987	3,863 (68%)	1,840 (32%)	5,703
1989	4,498 (74%)	1,589 (26%)	6,087

Although not an appropriate response to high-priority violators, informal enforcement actions, such as warning letters and notices of violations, can be a very efficient means of returning facilities to compliance. Not only have the national reporting measures focused only on formal enforcement actions, until recently their focus has been narrowed further to such actions only at land disposal facilities (e.g., STARS). As Figure 18 illustrates, STARS measures only 11% of RCRA enforcement activity.

Table 8 shows that the RCRA enforcement program follows up on violations that are found. While the results for fiscal 1989 are noticeably higher, we do not feel they are unacceptably so; this is because enforcement actions taken for violations found toward the end of the fiscal year may not be accounted for yet. Again current STARS measures do not show this positive result.

FIGURE 18

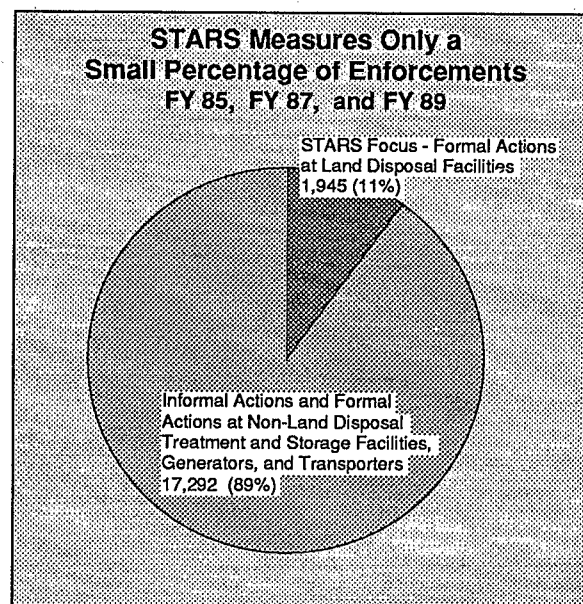


TABLE 8

Percent of Violations for Which No Action Was Taken Is Low			
Fiscal Year	Generators/Transporters	Non-Land Disposal, Treatment, and Storage Facilities	Land Disposal Facilities
1985	8	8	3
1987	9	8	4
1989	14	15	18

The number of enforcement actions taken in a given year is also not an effective measure of program success. As Table 9 shows, while the number of enforcement actions at land disposal facilities for fiscal 1985, 1987, and 1989 was fairly constant, return to compliance rates³ for these facilities have decreased. This is expected, since such facilities' RCRA obligations are often very complex and expensive. Thus, while the number of actions is a valid measure of the resources being devoted to RCRA enforcement, it is not a good way to measure the program's success.

² EPA has formed a work group that is charged with developing better environment indicators for the RCRA accountability system.

³ "Return to compliance rate" is that percent of violations discovered in the indicated fiscal year and corrected as of February 1990.

TABLE 9

Percent Returned to Compliance Is Decreasing				
Fiscal Year	Number of Land Disposal Facility Actions	Percent Generators/Transporters	Percent Non-Land Disposal Treatment, Storage, and Disposal Facilities	Percent Land Disposal Facilities
1985	1,669	71	73	70
1987	1,605	74	68	54
1989	1,544	45	42	32

RECOMMENDATIONS:

- Make better use of information currently reported and available in order to obtain a more comprehensive picture of activities and accomplishments. While a priority activity reporting system such as STARS is necessary, its limitations should be understood, and it should not become an end unto itself.
- Maintain a strong formal enforcement program, with emphasis on imposing penalties that are appropriate for the violations, but also recognize that the objective of compliance may be obtained through less formal mechanisms.
- For perspective, compare overall compliance rates vs. high-priority violator enforcement actions.
- Continue work group efforts to improve STARS to provide better incentives for quality actions and environmental results.

Better Measurement Tools Are Available

FINDING: Compliance monitoring and enforcement have caused a fundamental change in behavior in major industries' handling of hazardous waste, resulting in substantially better environmental management. However, many questions remain regarding the degree to which C&E has been successful.

DISCUSSION: Compliance and enforcement are the backbone of any regulatory program. Thus, their

success or failure is critical to the fate of the program as a whole.

Data collection and assimilation are central to measuring the effectiveness of the RCRA program. The current automated system, the Hazardous Waste Data Management System (HWDMS), has often been criticized for its poor quality. The reasons for this perception include problems with hardware and software, difficulties with data entry and retrieval, "ownership" of data,⁴ and data quality. The poor quality of the system has often resulted in a more negative picture of RCRA success than has been warranted.

To effectively manage the full range of RCRA activities, EPA has developed a new data system, the Resource Conservation and Recovery Information System (RCRIS). The new system is management-oriented, with the states as the owners and primary users of the data. However, EPA information for oversight purposes can be extracted. RCRIS is being phased in and is scheduled for full implementation during fiscal 1992. Until then, both HWDMS and RCRIS must be maintained, which is likely to lead to additional problems with resources and data quality.

The Biennial Report has the capability to demonstrate trends and reductions in hazardous waste. However, this tool has never received sufficient emphasis to be used effectively. The effects of waste minimization to avoid regulation and save costs could be demonstrated. The effects of the land disposal restrictions and other initiatives could be documented, and new initiatives could be developed based on the report. Instead, the last available published compilation summary is for 1985 submissions. EPA cannot identify trends and measure success with old information.

Because RCRA is essentially a preventative program, many of its environmental benefits (such as *prevention* of future ground-water contamination) are not tangible and may not be recognized until many years from now. Thus, it is difficult to demonstrate immediate, quantifiable environmental results from RCRA. In this way, RCRA is fundamentally different from other programs administered by EPA. For example, under the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act, end-of-

⁴ "Ownership" of data is important because if the generator of the data will be *using the data*, then that generator is much more likely to accurately report the data.

pipe controls can demonstrate immediate, quantifiable reductions of pollutants entering the environment. In contrast, the RCRA requirements are intended to prevent future releases of hazardous waste or hazardous waste constituents. Thus, measuring and demonstrating environmental success is difficult, unless we look to potential releases prevented through C&E activities. For example, the loss of interim status provision and the surface impoundment retrofit enforcement initiatives have reduced the number of land disposal facilities, and particularly surface impoundments seeking an operating permit to manage hazardous waste, by 98%. This significant environmental benefit has never been successfully publicized. Additional measures include the enforcement of closure plans and ground-water monitoring that can demonstrate that contamination has been diminished.

The corrective action authorities under HSWA provide additional areas to demonstrate environmental successes and program progress. All RCRA treatment, storage, and disposal facilities with releases are subject to corrective action—at a minimum, to investigate the releases for potential further action. In this regard, the number of sites eventually addressed by RCRA will far outnumber those addressed through Superfund. (See the Corrective Action chapter of this report.) With time, the RCRA program will be able to provide analytical results demonstrating cleanup of contaminated ground water and eventually ground water restored to the required levels.

RECOMMENDATIONS:

- De-bug the RCRIS system, and put it on line to better serve the states in managing and implementing the C&E program than HWDMS currently is serving them. Focus oversight analysis of RCRIS data on establishing program trends and on reporting a more comprehensive view of success. Quickly identify program areas needing improvements, and implement appropriate special initiatives as proactively as possible.
- Upgrade the Biennial Report to record changes in the way the regulated community manages wastes in response to RCRA requirements. This requires a commitment of resources at both the EPA and the state levels.
- Develop techniques and explore opportunities to measure environmental results. Better quantify and communicate the environmental

results of C&E in obtaining adequate land disposal facility closures and ground-water monitoring systems that have reduced threats to ground water.

Poor Communication Breeds Misperceptions

FINDING: Because communication of RCRA C&E's success has been ineffective, three commonly held (mis)perceptions hurt EPA's ability to do our job:

1. RCRA is overshadowed by Superfund in terms of both publicity and resources. Superfund gets a disproportionately larger share of resources, particularly given the important preventative nature of RCRA.
2. RCRA regulations are largely paperwork nuisances that have little relevance to protection of human health and the environment.
3. The RCRA civil enforcement program is less effective than other media programs like the air and water programs.

DISCUSSION: The interviews provided very useful information regarding perceptions of the RCRA program. However, many of the perceptions related to the RCRA program generally, rather than specifically to RCRA C&E. For example, many people perceive RCRA regulations, such as the definition of "solid waste," to be overly complex and unworkable. While such perceptions may indirectly affect the C&E program (especially when held by regional or state enforcement personnel), the primary focus of this section is on those perceptions that directly relate to C&E.

In the eyes of the general public, RCRA and Superfund are not separate programs. Both appear to be viewed as "the nation's toxic waste laws." When a distinction is made, Superfund tends to receive far more concern, because it is perceived to be addressing leaking sites, which are more newsworthy than RCRA enforcement issues. The public is much better educated today about environmental issues than it was 10 years ago. With the right information, effectively communicated, people should be able to get a good grasp of the importance of RCRA.

Many people correctly perceive that the Superfund program overshadows RCRA in terms of the resources allocated to it. However, this fact is perhaps less significant than the fairly widely held perception that the resource allocation is

disproportionate to the relative importance of the two programs, particularly given the preventive nature of RCRA. Thus, a shift in this allocation may be needed.

The perception about "paperwork nuisances" is at variance with EPA's strong belief that RCRA's recordkeeping and reporting requirements are essential to an adequate C&E program: they are integral to protecting human health and the environment and preventing pollution. Better communication of the critical nature of these requirements would enhance the program's perceived credibility.

Finally, throughout the interviews many people expressed their belief that the RCRA civil enforcement program is less effective than other media programs like air and water. Although some of the perceptions about the effectiveness of RCRA's civil enforcement program are founded on perceived flaws, others were based on a more sympathetic view of the C&E program, both as a newer program that still has "growing pains" and as a smaller program in terms of resources. However, in reality, the RCRA civil enforcement program has performed very well in numerous areas when compared to other media programs (See Appendices G and H). In particular, the administrative enforcement program, which has been the primary focus of RCRA C&E efforts, has performed as well as or better than most other media C&E programs in terms of addressing significant non-compliers, total penalties, number of cases with penalties, median penalties, and highest penalties. Although the number of judicial cases and new civil judicial referrals is relatively small in comparison with that of other programs, the RCRA C&E program has recorded the highest judicial penalty by a substantial margin. These accomplishments in both the administrative and judicial enforcement programs are also significant in light of the relatively small size of the RCRA C&E program, when compared with other media programs.

Regardless of the actual measures, the perception that the RCRA C&E program is vigorous and tough is critical to a successful effort. While EPA recognizes that there is room for improvement,

it must also recognize that it needs to do a better job of communicating the many successes of the C&E program.

RECOMMENDATIONS:

- Rather than focusing on distinguishing RCRA from Superfund, focus more on enhancing the public's understanding of EPA's successes in implementing and managing hazardous waste programs. This option is premised on the notion that the public is less concerned with the nuances and peculiarities of federal law, and that an effort to distinguish RCRA from Superfund may be difficult and/or unnecessary.
- Issue specific guidance to headquarters and the regions on how to better relate RCRA's C&E accomplishments to real-world problems. Initiate new training of existing C&E employees, to help them better characterize recordkeeping and reporting violations as highly significant, rather than simply as violations of obscure and irrelevant regulatory provisions. The same goals may also be accomplished by training only a few selected representatives in each C&E office, or creating a part-time position in each C&E office.
- Improve RCRA's image by better use of the print and broadcast media to publicize EPA's successes. As discussed previously, specifically integrating such efforts into targeted enforcement initiatives is one method of implementing this approach.
- Use the media proactively, particularly when an Inspector General, General Accounting Office, or other critical report will be released imminently. Currently, such critical reports tend to generate far more media interest than press reports outlining RCRA C&E accomplishments. In such cases, EPA may choose to conduct a parallel (albeit abbreviated) study aimed at diffusing and resolving some of the concerns likely to be raised in such reports. By addressing such critical reports early, or even before their publication, EPA may be able to contribute to a more balanced and favorable perception of the RCRA C&E program.

1. The first part of the document is a list of the names of the persons who were present at the meeting. The names are listed in alphabetical order.

2. The second part of the document is a list of the topics that were discussed at the meeting. The topics are listed in alphabetical order.

3. The third part of the document is a list of the actions that were taken at the meeting. The actions are listed in alphabetical order.

4. The fourth part of the document is a list of the dates when the actions were completed. The dates are listed in alphabetical order.



CHAPTER 7

Corrective Action: A Strategy for Protection

Introduction

Under HSWA, all facilities issued a RCRA permit after November 8, 1984, must take "corrective action" for (i.e., must investigate and clean up) contamination at or from the facility, including releases from past disposal. Corrective action can be initiated through the permit process or through enforcement orders. The processes for both are similar, except that orders do not require a public comment process. The intent of this provision, and similar enforcement authorities under HSWA, is to ensure that RCRA hazardous waste facilities are not harming human health or the environment.

Steps in the Corrective Action Process

Several basic steps are common to the corrective action process:

RCRA Facility Assessment (RFA) - Systematic identification of actual or potential releases through examination of every solid waste management unit.

RCRA Facility Investigation (RFI) - Characterization of the nature, extent, and rate of migration of each release.

Corrective Measures Study (CMS) - Identification of appropriate corrective measures, and study of their likely effectiveness and feasibility.

Corrective Measures Implementation (CMI) - Design, construction, and implementation of corrective measures.

Interim Measures (IM) - Corrective actions to stabilize, control, or limit further releases can be taken at any point in the process where there is an immediate threat or an opportunity to get action under way.

All steps except the RFA are conducted by the owner/operator of the facility, with oversight by EPA or a state; the RFA is conducted directly by EPA or a state. The steps, which are discussed in detail in guidance, do not need to be followed

rigidly by the regions. For example, the CMS can be truncated or eliminated if a single remedial alternative is obvious.

Implementation of the options described in this chapter will require shifting many of the resources now being used to impose RCRA Facility Investigations (RFIs) and oversee corrective action, to completing upgraded RCRA Facility Assessments (RFAs) for all facilities and stabilizing releases at the most environmentally significant facilities. The idea is to obtain better, more focused information early in the process, to set priorities for cleanup, to impose interim measures to control releases, and to vary oversight based on the record of the owner or operator and the magnitude of the task. The regions and the states have the flexibility to decide which priority sites require action first, the scope of the interim measures, and the level of oversight. Additionally, some projects will require immediately imposing corrective action activities beyond interim measures.

This proposed shifting of resources represents a dramatic change in the near-term activities of the program and will take time to implement. However, once properly implemented, it should produce environmental improvements at more facilities over the next decade than the present program will. The most important near-term action is to evaluate the currently imposed RFIs using regional priority-setting mechanisms to determine each facility's priority. This should then be used to justify modifications to the level of oversight and the compliance schedule. This facility-by-facility plan, which incorporates, to the extent possible, the approach described in this chapter, will ensure that resources are spent on the highest-priority facilities.

Findings and Options

Magnitude and Severity of the Problem

Unlike the other sections of this chapter, this section does not follow up its findings and discussion with recommendations. Rather, it sets

the stage for the other sections, especially by highlighting the need for setting achievable goals and priorities within the corrective action program.

Thousands of Facilities Require Corrective Action

FINDING: The number of facilities that need corrective action may be three times greater than the current number of Superfund sites.

DISCUSSION: Despite the straightforward nature of the corrective action process and the simplicity of HSWA's mandate—to protect human health and the environment against contamination from RCRA facilities—the task is enormous.

The current RCRA universe is composed of approximately 4,700 land disposal, incinerator, and treatment and storage facilities (see Figure 19). Of these, about 3,700 facilities that house about 64,000 solid waste management units may need corrective action. These data suggest that the number of RCRA facilities that may ultimately need corrective action could be three times the number currently on the Superfund National Priorities List (NPL).

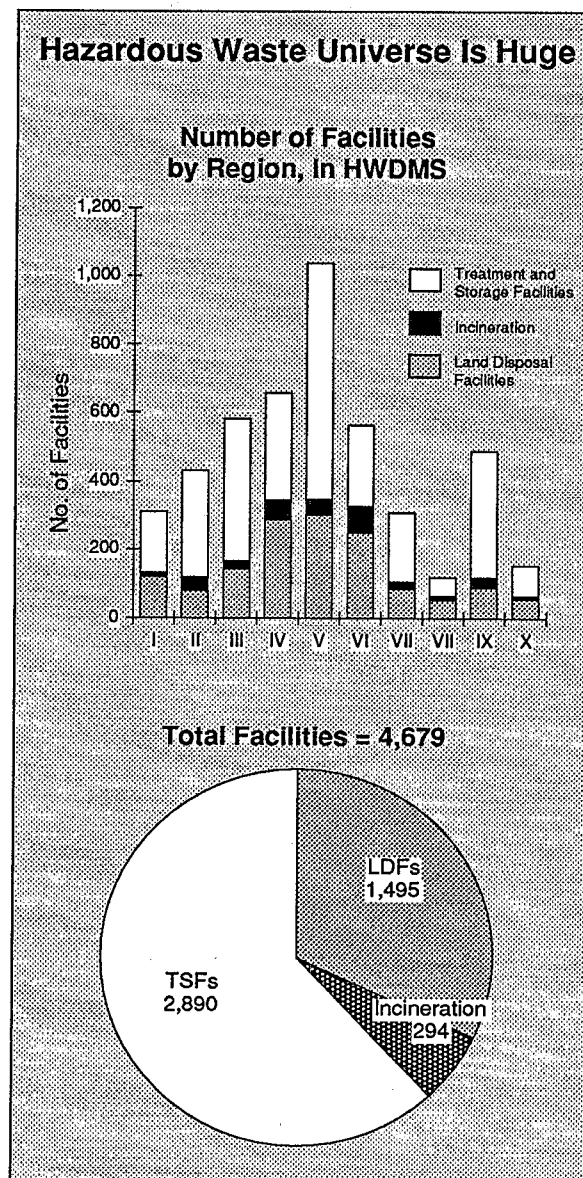
Table 10 gives a breakdown of the number of facilities in the early steps of the corrective action process. The low number of facilities that are past the initial assessment stages reflects the enormity of the task and the short time the program has been in progress. Of the approximately 4,700 RCRA facilities:

- about 3,000 (mostly treatment and storage facilities) still need an RFA to determine whether there are releases, and
- about 2,400 of these will probably need an RFI.

Note that of the facilities that have had RFAs, about 1,300 (or about 80 percent) require RFIs to assess releases. Despite the persistent efforts of staff, only 21 RFIs have been completed to date.

On the bright side, more work has been done toward cleanups than these figures indicate. For some facilities with straightforward contamination problems and solutions, remedial measures have been studied and selected without completing an RFI. Moreover, interim cleanup measures have been taken at over 40 facilities. Final, complete cleanup of facilities clearly requires much work conducted in a number of steps. Given the number of facilities, the task ahead is monumental.

FIGURE 19



Problems at Some RCRA Sites May Equal or Exceed Those at Superfund Sites

FINDING: Although corrective action at many RCRA facilities should be relatively uncomplicated and quick, there may be especially difficult environmental and compliance problems at many other facilities, particularly those that are or will be closed.

DISCUSSION: Fortunately, the problems at many RCRA facilities may be less severe than those at Superfund sites. Unlike Superfund sites, most

have known owners and operators and more information on their waste and compliance history.

Nevertheless, at a number of RCRA facilities, the corrective action problems may equal or exceed those of a typical Superfund site. For example, a group of manufacturing and disposal facilities on the Niagara Frontier in New York, which includes eight RCRA facilities and several Superfund sites, has created a very complex contamination problem with toxic releases to the Niagara River. Corrective action at federal facilities (which this study did not specifically address) may also present very difficult problems.

Furthermore, about 60 percent of the 4,700 RCRA facilities are closed, closing, or likely to close. This percentage includes facilities that have not submitted a permit application or that have been denied a permit, and storage and treatment facilities that have not clearly stated whether they intend to continue operating. An even larger percentage (nearly 90 percent) of the land disposal facilities, which have some of the worst environmental problems, is closing.

Although available data are limited, the environmental problems at closing facilities may be greater than problems at facilities that continue to operate. Many facilities choose to close because the severity of their problems makes it too difficult or costly for them to come into compliance. Further, many closing facilities may be less financially able to pay for corrective action, and some of them may become candidates for the Superfund program.

Setting National Program Goals and Priorities

Given the magnitude and severity of the corrective action problem, a good set of national goals and priorities is critical to the success of the program. This section examines some of the obstacles to such goals and priorities.

This evaluation benefits from several previous program strategies and studies. In 1986 EPA formulated a National RCRA Corrective Action Strategy, which addressed, among other things, establishment of priorities. In 1989 EPA formulated

TABLE 10

The Corrective Action Workload Is Enormous

	RCRA universe	Facilities with completed RFAs	Facilities with RFAs where RFIs are necessary	Facilities where RFIs have been required through permit or order	Facilities with RFI Work Plan approved	Facilities with RFI completed
Region I	313	88	74	24	7	0
Region II	435	169	134	35	9	3
Region III	584	173	145	49	17	3
Region IV	658	270	226	146	47	6
Region V	1,040	357	281	90	28	4
Region VI	565	331	258	98	37	4
Region VII	311	77	70	34	4	1
Region VIII	123	40	34	20	3	0
Region IX	492	77	70	59	3	0
Region X	458	53	39	46	19	0
Total	4,679 *	1,635 **	1,331 **	601 **	174 **	21 **

* Numbers in Hazardous Waste Data Management System as of 3/1/90.

** Numbers in Corrective Action Reporting System as of 3/17/90.

a Corrective Action Outyear Strategy (CAOS), which pointed out the need to control the flow of facilities in the corrective action "pipeline" by setting priorities at each step. CAOS explored innovative ways to expedite the cleanup process, including using interim measures before or concurrent with the site study. It also presented a continuum of approaches to EPA or state oversight—ranging from "quasi-voluntary" for low-priority sites to full oversight for high-priority sites—to ensure that government resources are allocated in proportion to the environmental benefit achieved.

EPA's Agency Operating Guidance for fiscal 1991 reiterates several of the points in CAOS. It notes that feeding of the pipeline should be controlled carefully by setting priorities based on the environmental severity of sites. It identifies as the primary focus of activities moving sites to actual cleanup, and encourages the use of interim measures wherever feasible.

Program Needs Clear National Priorities

FINDING: While most regions appear to be operating under the broad program goal of cleaning up all facilities that have environmentally significant releases, they are operating individually in the absence of clearly articulated national program goals.

DISCUSSION: One of the most frequently mentioned reasons for the slowness of the corrective action program is the lack of a clearly articulated national program goal. As one person stated, "Since no one really knows what the goal is, it is difficult to achieve success." Without such a goal or strategy for program accomplishment, the corrective action program cannot ensure that it is achieving important environmental results.

The majority of regions view the primary long-term goal of the corrective action program as the cleanup of all facilities that have environmentally significant releases, in the order of worst sites first. Other regional views of program goals include cleaning up all releases, avoiding Superfund emphasis on process over results, and creating a smooth-running cleanup program.

Industry views the program goal as the cleanup of sites in a manner appropriate to the risk and reasonably foreseeable land use, focusing on results rather than on process. An environmental group views the goal as the prevention of future Superfund sites.

Although EPA has issued significant guidance in the past five years on various aspects of the corrective action process, the regulation EPA has drafted to codify both procedures and standards for corrective action (Part 264, Subpart S) has yet to be proposed. All groups agreed that EPA must promulgate the final Subpart S rule in order to establish the basic direction and goals for the program.

Given the magnitude of the corrective action program and the need for greater national direction, a review of the current resources and organization for the program in headquarters raises a number of concerns. For example, in EPA headquarters, which is responsible for national program management and for developing regulations and guidance, only 17 work years are budgeted for the corrective action program, compared to 275 work years for Superfund. Most of EPA's support for cleanup is devoted to Superfund, but this support is also essential for the corrective action program. This study did not develop any recommendations to resolve these issues, but does recommend carrying out some actions with Superfund to take advantage of its experience and expertise. Additional review may be appropriate to identify further the programs' interrelationship from a management point of view.

RECOMMENDATIONS:

- Develop and implement an overall program strategy that achieves environmental results at facilities with the most serious problems.
- Promulgate the Subpart S rule for corrective action as soon as possible.
- Examine the effectiveness of the current organizational and support structure in headquarters for managing the corrective action program.

Key Priority-Setting Process Is Not Effective

FINDINGS: The Environmental Priorities Initiative (EPI) has been slow to start up and has had a minimal impact so far in determining corrective action priorities. Some regions feel that the EPI does not provide the information they need for setting corrective action priorities.

DISCUSSION: The EPI is an integrated RCRA/Superfund effort to identify and evaluate sites that present the greatest risk to human health and the

environment. It is supposed to be the primary means for setting priorities for corrective action among the large number of facilities that have not yet been assessed. The initiative involves a streamlined priority-setting mechanism for closing RCRA land disposal, storage, and treatment facilities to determine for which facilities a more detailed assessment should next be performed, using Superfund Preliminary Assessments (PAs) to estimate the significance of a problem at a facility.

The EPI has not yet made a significant impact on setting initial priorities. Of the 3,000 PAs to be done under EPI, fewer than 600 were done in fiscal 1989, the first year of the EPI process. While an evaluation of this delay is beyond the scope of this report, the regions did identify some problems they perceive in making the initiative work for corrective action.

A number of regions said that the EPI is not helpful because a PA does not look at each individual solid waste management unit or necessarily determine whether there is a release or potential for release. Also, despite fiscal 1989 guidance, in some regions the EPI continues to provide information that is formatted for Superfund and is less relevant to RCRA. Several regions have worked with Superfund staff and contractors to make the PA more suitable to RCRA program needs. Other regions, however, believe that such modifications take a lot of time and effort.

Additionally, the EPI process does not provide sufficient sampling information for early actions at solid waste management units. In most cases, the current process includes a file review and a visual site investigation, but does not include site sampling.

Finally, regions believe they are getting mixed messages about EPI from headquarters. It is not clear to them whether the EPI will continue to be promoted as a priority-setting mechanism. However, several regions do use the EPI as the basis for their priority-setting system.

RECOMMENDATIONS:

- Accelerate the EPI process.
- Modify the products of the EPI process to include more sampling during the site investigation phase to allow development of specific corrective action provisions in permits and orders, particularly for interim measures. The additional field data could be obtained

through EPA actions or through enforcement orders issued under RCRA Section 3013.

- Have the Superfund program continue to support the implementation of the EPI.

National Guidance Is Needed for Setting Consistent Priorities

FINDING: National criteria and guidance — not a national ranking system — are needed to ensure consistency among regions in setting priorities.

DISCUSSION: Permits are largely driven by statutory deadlines. Many regional enforcement managers, however, are basing their priorities predominantly on risk factors. These factors include the number and type of violations at a facility, evidence of release from the facility, the facility's proximity to a water supply, the environmental sensitivity of the area around the facility, the toxicity and quantity of waste at the facility, and the type of solid waste management unit involved.

Most regions use a modified version of the Superfund Hazard Ranking System (HRS) to obtain an objective, quantitative measure of risk. One region has adapted the HRS to RCRA and has made it computer-based. Designed to be less data-intensive than the HRS, this system can be used for scoring individual solid waste management units at a facility. The region has ranked a total of 183 facilities using the system, and finds it very cost-effective for scoring facilities.

Another region has developed a multi-media priority-setting system for one of its states, using a Geographic Information System (GIS). The system produces a preliminary ranking of facilities based solely on their potential to contaminate community ground-water supplies. It then uses an automated source-pathway-receptor model based on the HRS to target facilities in critical areas. Other regions are in various stages of developing GIS capabilities, and in the long term this approach could be valuable in setting environmental priorities.

When asked whether there should be a national ranking system for corrective action sites, eight regions responded negatively. These regions were strongly opposed to a national ranking system for several reasons. Some think that EPA is too far into the program to begin a major shift in setting priorities: too many facilities are already in the "pipeline," resources have been set for oversight,

and priorities are already being set using the EPI and other region-specific ranking schemes. And some regional managers think that a national system would unavoidably slow down the program due to necessary start-up procedures, reallocation of resources, and guidance development.

Some regions believe the program does not have the resources needed for creating a national ranking system, and they do not want to take resources from overseeing activities at facilities (especially land disposal facilities) in the pipeline in order to rank new and possibly less environmentally significant sites, such as storage facilities. Also, although most regions are moving toward a predominantly risk-based ranking scheme, they emphasized the need for flexibility in considering non-risk-based regional and state considerations when assessing priorities.

However, when asked if there should be a uniform scheme for establishing corrective action priorities among the regions and the states, many regions thought that national criteria and guidance should be developed to help them set priorities consistently. They emphasized that such criteria should not be viewed as a rigid, nationally imposed scheme that would supplant present regional and state priority systems.

RECOMMENDATIONS: Provide national guidance consisting of uniform criteria for each region to apply to determine its own priorities. Regions would rank their facilities on a worst-site-first basis, using a combination of region-specific and nationally uniform criteria.

Streamlining the Corrective Action Process

Work Plans Can Be Addressed by Their Priority

FINDING: There is a large backlog of RFI work plans requiring review.

DISCUSSION: Approximately 430 RFI work plans are awaiting approval. In general, the regions with large numbers of facilities, particularly land disposal facilities, seem to take longer to review and approve RFI work plans, and have backlogs of two to nine months. Other regions with no appreciable backlog as yet anticipate developing one.

The average time to approve an RFI work plan after the imposition of the RFI is 309 days. This

represents both the actual time to review the work plan and the time the plan waits on a shelf because no one is available to review it. Such long delays in reviewing RFI work plans may make it difficult to insist that owners and operators take prompt action.

Most regions review RFI work plans in the order in which they receive them. Based on RFA data and regional criteria for setting priorities, each RFI work plan could be classified, and high-priority work plans could be addressed quickly.

RECOMMENDATIONS:

- Review all permits that have imposed RFIs and, based on the risk presented by each facility, establish high, medium, and low priorities for reviewing the RFI work plans. For lower-ranked facilities, permit modifications may be advisable to reduce the scope or oversight level, or to prolong the schedule, of the RFI.
- Officially notify owners and operators of expected delays, and give them an estimate of when the review will begin.

Corrective Action Can Be Phased

FINDING: In many cases, corrective action activities are being imposed for the entire facility, and phasing of actions to address significant releases first is only being used in limited situations.

DISCUSSION: Most permits address corrective action requirements for the entire facility and cleanup process. While some regions expressed the view that an RFI should address all solid waste management units at a facility, others favor phased RFI activities to address the worst ones first. Some regions have phased RFIs to spread the workload over a number of years.

Some states have shown an active interest in a substantially different approach to managing their corrective action program. For example, instead of moving each facility through final cleanup on a facility-by-facility basis, one state is focusing its resources first on requiring short-term stabilization before site investigations. The state will then focus on long-term stabilization at all sites as appropriate to prevent the further spread of contamination. After completing long-term stabilization, the state will focus on final cleanups. This state is also implementing a "non-oversight" option that would allow cooperative owners and operators (after long-term stabilization has been completed) to proceed with final cleanup without extensive oversight. A

major component of this approach is the development of performance standards.

Several regions were enthusiastic about the value of interim measures in achieving rapid source control, stabilization, containment, or other results that significantly reduce the severity of the problem at a site. Some regions thought the key to making demonstrable short-term progress in the corrective action program was the routine use of interim measures before or concurrent with the RFI and/or CMS phases.

Other regions expressed concern with such an approach because of the limited data available at the completion of the RFA. Since many regions do not sample during the RFA, interim action would require upgrading the RFA or doing a focused RFI. One region thought the phased approach could work if the RFA were followed by an investigation with sampling to determine the sources and extent of contamination. This approach is similar to that of Superfund, which does more intensive initial investigation of a site with potential for listing on the NPL to allow early action to correct or stabilize releases.

RECOMMENDATIONS:

- Adopt a three-phase approach to corrective action, giving emergency actions and control of releases at all facilities higher program priority in the near term than final cleanup actions at most facilities. The great majority of near-term work would be in the second phase, which focuses on controlling releases at facilities by using interim measures. The objective of the first and second phases is to make facilities safe and stable before undertaking long-term cleanups. The third phase consists of the final cleanup of the stabilized facility. To the extent practicable, interim measures should be specified after completion of RFAs and before completion of RFIs.
- For all future permits, schedule immediate or short-term corrective action only on the highest-risk facilities, and focus on emergency and interim measures to control releases at these facilities. If RFIs are imposed, phase them to study the most critical solid waste management units first.
- For the final, longer-term cleanup of facilities, develop performance standards for cleanup. Such standards should encourage owner/operator-initiated actions and should extend oversight resources by eliminating detailed project reviews. They should initially focus on

field activities and on cleanup levels for ground water and for soil for direct contact, and then be expanded to other media or pathways and to standards for specific technologies and industry wastes.

Permits Can Be Issued According to Priority

FINDING: Almost every region identified the HSWA permit deadlines as a barrier to setting priorities based on the most environmentally significant problems.

DISCUSSION: Even though the regions are attempting to set priorities, statutory deadlines for permitting have not allowed EPA the flexibility to target corrective action to the highest-risk facilities or portions of facilities. For example, treatment and storage permits are being issued at the expense of writing permits for or enforcing against higher-risk closed and closing land disposal facilities. Approximately 850 treatment and storage facilities still need permits, while over 1,300 post-closure permits need to be written for land disposal facilities.

In addition, most permits must include corrective action provisions for all solid waste management units, regardless of their threat; however, the timing for imposing these provisions is flexible. In contrast, corrective action orders tend to be targeted to high-risk facilities, for which action is immediately warranted, and to releases from specific solid waste management units.

RECOMMENDATIONS:

- Through appropriate legislative change, eliminate the requirement to impose corrective action in all permits at the time of issuance when those permits are driven by statutory deadlines, and instead impose corrective action first at the most environmentally significant facilities and solid waste management units.
- In the interim, establish permit schedules for complying with corrective action requirements and, in particular, for submitting RFI work plans. Base those schedules on the environmental significance of the release.

Consent Orders Are Faster Than Permits Overall

FINDING: Many regions are issuing consent orders rather than permits, or are taking steps to minimize permit appeals.

DISCUSSION: Overall, the time range for issuing consent orders and permits is similar—about 2 to 25 months total elapsed time (including shelf time). However, permit appeals cause long delays in the implementation of corrective action and can drain EPA resources. The majority of appeals apparently concern identification of solid waste management units and the scope of the RFI. Industry alleges that the risk presented by a particular unit is often unknown or highly questionable, but that the regions, when in doubt, impose RFI requirements, rather than give the owner or operator the opportunity to provide more conclusive information.

Most regions believe that they can issue consent (as well as unilateral) orders much faster than permits, and that avoiding the permit appeal process more than compensates for any extra time spent on order negotiations. Regions that have adopted rigorous order negotiation deadlines and that have occasionally used unilateral orders (which take two to four months) have substantially expedited their order issuance. Moreover, consent orders include stipulated penalties, which can be assessed and collected administratively; violations of permit conditions require initiation of a separate enforcement action.

Many regions are turning to consent orders rather than permits, or are taking steps to minimize permit appeals. One region does more work up front to develop a detailed work plan in the permit to reduce the uncertainty and to cut down on appeals. Several regions are holding meetings or negotiating with permit applicants over RFA findings, the scope of the proposed RFI, and other permit conditions. Representatives of an industry group specifically recommended that, to avoid appeals and litigation, EPA should share the RFA with the permittee before issuing the permit to resolve factual inaccuracies and issues.

One reason for the potentially shorter time to issue an order is that orders do not currently require a public comment process, whereas permits require opportunity for public comment before they are issued. The enforcement program has recognized the need for community involvement, but has found that in many cases the public is not interested in the RFI or interim-measure phases of the program. The level of interest may change when the corrective action program moves to later phases. One region is developing guidance under which an owner or operator develops a public relations program to ensure that local residents are aware of activities

conducted in accordance with the consent order. It is likely that EPA will have to establish a parallel public participation or relations process for orders to ensure that there is no lesser opportunity for public input under orders than under permits.

RECOMMENDATION: To reduce the number of solid waste management units that unnecessarily enter the corrective action system, allow owners and operators to review draft RFA reports and to undertake supplemental investigation to address specified, questionable units or releases before imposing the formal RFI phase of corrective action. These investigations could also serve to provide the necessary data for imposing interim actions.

Post-Closure Permits Are Especially Difficult

FINDING: Permitting closed facilities may be lengthier and more difficult than permitting active facilities because of the lack of incentives for obtaining a post-closure permit.

DISCUSSION: Some closing facilities are owned or operated by companies who want to comply with RCRA requirements because they want to continue their manufacturing or process operations. For facilities in these categories, post-closure permitting may not be difficult and could be completed in a reasonable period of time. Others, however, may be closing all operations and may not be financially viable or willing to take appropriate cleanup actions. In these cases, enforcement orders under RCRA or Superfund may be necessary to ensure proper cleanup.

EPA's primary recourse for an inadequate permit application is denial of the permit or initiation of an enforcement action. Some regions have expressed concern that as the 1992 permitting deadline nears for storage and treatment facilities, many are expected to close in increasing numbers. Since these closing storage and treatment facilities (an estimated 1,800 today) will have no units subject to post-closure permitting, any corrective action will have to be imposed through enforcement. Before issuing orders, however, EPA will need to conduct RFAs at these facilities or obtain equivalent information.

RECOMMENDATION: Develop facility-specific compliance plans that determine the most effective compliance mechanism to ensure final facility cleanup.

Oversight Can Be Tiered and Voluntary

FINDING: While there appears to be a growing acceptance of the need to vary the levels of oversight to better allocate resources, there are no nationally consistent criteria for varying oversight. No effective mechanism exists to allow collection of oversight costs.

DISCUSSION: To better allocate limited resources, half of the regions use a tiered approach to oversight, varying the level of oversight at different facilities. Among the factors they consider in deciding what level to apply are availability of resources, the severity of environmental problems at the site, the site's complexity and compliance history, and the level of public involvement. Of the regions that do not vary oversight, some indicated that they believe all of their facilities pose high risks and require full oversight. The regions also differ with respect to the level of oversight they consider necessary for a given situation. Several regions noted that a high level of oversight would be necessary if they are responsible for selecting a protective remedy, as required in the current draft of the Subpart S rule. Clearly, the program has yet to define the appropriate level of oversight for different facilities.

The regions generally do not encourage voluntary or owner/operator-initiated corrective action. When approached by owners or operators who are interested in initiating the corrective action process, but whose facilities are low in priority or far down in a queue, some regions advise that they may proceed on their own, but their actions would not relieve them from future EPA requirements.

Environmental groups generally favor strong oversight, but expressed concern that it would discourage "voluntary" cleanups. Industry favors lower levels of oversight for responsible owners and operators.

One approach for reducing the level of oversight and placing more accountability on the owners and operators is to develop performance standards for site cleanup (e.g., soil levels for direct contact). Performance standards could encourage "voluntary" corrective action and reduce oversight of remedy selection. In general, industry groups agreed that this approach would speed up the process, but expressed concern that flexibility would be restricted. They would prefer participation in a rulemaking, but they recognized this would take a very long time.

One way to assist EPA in undertaking more oversight is by reimbursing EPA for its oversight costs. RCRA Section 3013, which allows for reimbursement if the owner/operator does not properly investigate releases from a facility, has not been used frequently but could provide reimbursement on a limited basis. In addition, EPA may recover costs or be reimbursed if Section 104 or 106 of the Superfund legislation (CERCLA) is used to order corrective actions. Each of these options has drawbacks or limitations. The establishment of 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 the funds from such a system go directly to EPA, as in CERCLA Section 122(b).

One industry group objected to the use of such funds for contractor-supported oversight. However, the group indicated it may support fixed user fees for RCRA permit processing and report review if the fees were coupled with deadlines for EPA to process permit applications and to review documents.

RECOMMENDATIONS:

- Implement a tiered oversight approach based on the type of corrective action activity, site priority, compliance history, and facility status.
- Carefully review current permits and orders to determine the most effective use of EPA or state resources for oversight.
- Meet with owners and operators early in the corrective action process to determine oversight levels, and encourage more owner/operator-initiated actions with minimal oversight.
- Recover EPA oversight costs by:
 - using RCRA Section 3013 enforcement orders for doing RFIs when the owner/operator does not provide quality RFI work,
 - using CERCLA Section 104 and 106 authorities for corrective action, and
 - establishing a RCRA trust fund or user fee system, through appropriate legislative change, ensuring that the proceeds return to EPA.
- Carefully review the requirement for EPA to select cleanup remedies before issuing the final Subpart S rule.

State Involvement Can Be Increased

FINDING: Despite the mandate for state authorization, the corrective action program is primarily federally run, principally because the states are concerned about the program's future resource burdens.

DISCUSSION: Officially, corrective action is almost entirely a federally implemented program, as only five states are authorized to run their own RCRA corrective action programs. In practice, some other states are quite active in supporting or implementing the federal program, and some more than match federally granted resources with their own. For example, New York and New Jersey, though not authorized, support EPA's regional office by overseeing many site studies under their own authorities. Nevertheless, in most cases, the final responsibility for RCRA corrective action rests with EPA.

The states are generally not encouraged to exercise their non-RCRA authorities to achieve cleanup, although several have the capability right now to bring more resources to bear through such mechanisms as user fees. In addition, some states and regions believe that resources are wasted and the timeliness of products suffers because EPA duplicates the state oversight and review process. Some regions have developed joint EPA/state programs for corrective action, in which the states undertake most of the oversight work.

States are most concerned about the resources required to carry out the corrective action program. They feel that the redistribution of fiscal 1990 grant resources does not help the program and will result in a smaller base RCRA program. They urge that corrective action not be undertaken at the expense of the existing prevention program. While some states believe that the most expedient way to maximize state participation is to transfer the responsibility for corrective action to them as quickly as possible, many states are reluctant to take on authorization because of concerns about resources or capability.

RECOMMENDATIONS:

- Promote states to become authorized for corrective action.
- Explore further the possibility of converting to state grants the money that EPA would otherwise put into extramural contracts, allowing states to build capability, while performing at lower cost than contractors.
- Acknowledge the work states do under their own corrective action authorities, and promote joint EPA/state cleanup activities with the goal of getting more cleanup done. Cut back on oversight for both authorized and unauthorized states to prevent duplication of oversight.



CHAPTER 8

Maximizing Program Resources: Human and Fiscal Factors

Introduction

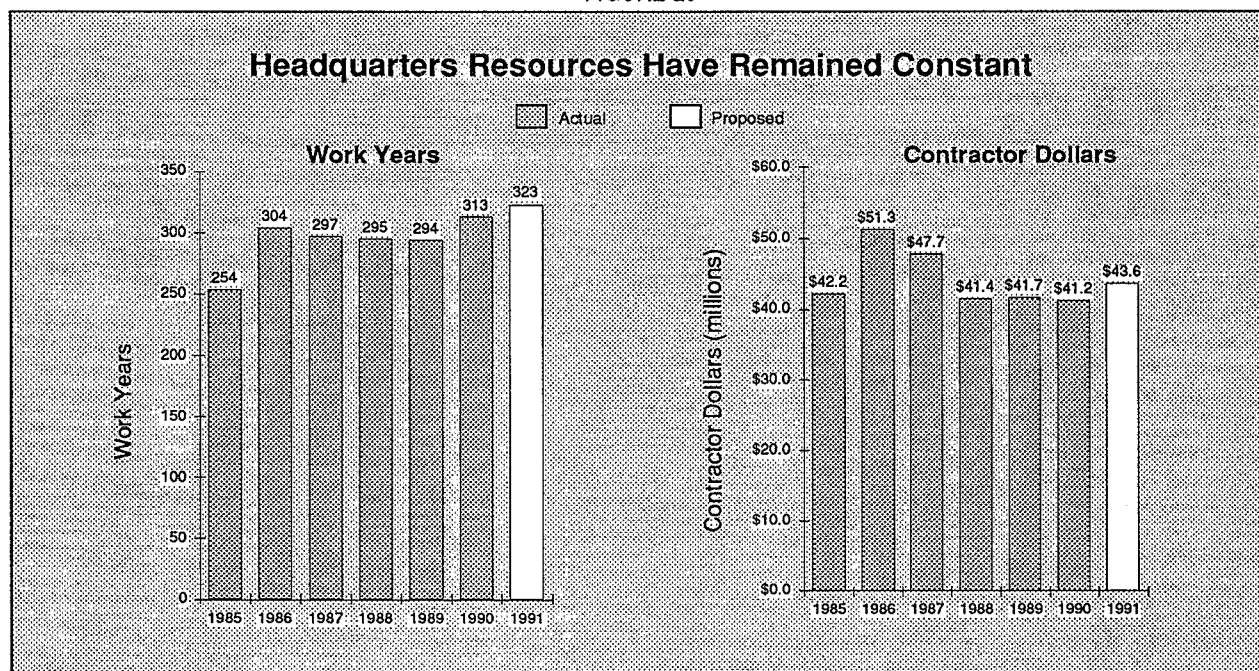
The ultimate success of the RCRA Subtitle C program will be determined by the capabilities, skills, and initiative of its work force and by the effective management and use of the program's resources. Upon analyzing EPA's allocation of resources since fiscal 1985 (the first year since the passage of HSWA), the Resources Subcommittee identified some basic trends in resource funding levels:

- modest increases—or little real increase, taking inflation into account—in work years and state grants over the past three or four years;
- a steady and dramatic increase in reliance on contractors in the regional offices; and
- significant increases across the board proposed for fiscal 1991.

The Subcommittee further analyzed these trends in resource funding levels, in view of the dynamic shifts in program responsibilities. Those shifts have occurred in response to both a maturing of the program and changing priorities resulting from statutory mandates, new regulations, Congressional oversight, and increasing public awareness and concern regarding municipal solid waste, medical wastes, and other special wastes not regulated under RCRA's hazardous waste program.

Within EPA headquarters, work years have increased about 18% since 1985, with most of the increase occurring between 1985 and 1986 (see Figure 20). This increase was dedicated to Subtitle D (solid, primarily non-hazardous) wastes and other special waste categories, with a slight decrease in work year resources for Subtitle C (hazardous) wastes. Work year resources for hazardous wastes are also shifting from support for regulatory development to support for program implementation.

FIGURE 20



During fiscal years 1987 through 1990, EPA regional work years and state grant funds have remained relatively constant (see Figure 21). Conversely, increasing resource demands have resulted, in part, from HSWA requirements to write permits for all land disposal, incineration, and storage and treatment facilities by November 1988, 1989, and 1992, respectively, and to address environmental releases through corrective action (cleanup) at both operating and closed facilities. As the states and regions have been largely successful in meeting the permit deadlines for operating land disposal facilities and incinerators, resources are being shifted in the budget from permitting to compliance monitoring and enforcement activities, and on a larger scale to corrective action to respond to the growing list of facilities that will require cleanup.

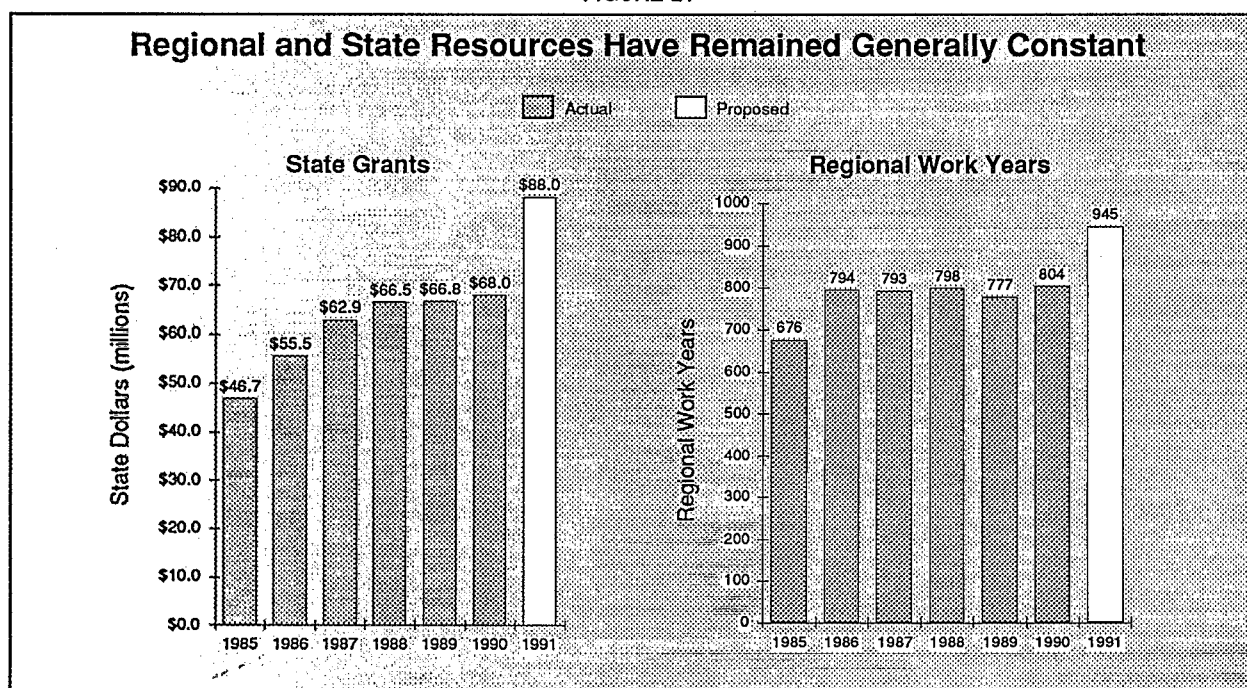
This chapter examines whether the overall resources devoted to RCRA are commensurate with EPA's major program requirements (both current and projected) and whether these resources could be managed more effectively. If Congress approves the President's proposed budget, resources allocated to RCRA could increase considerably in fiscal 1991. However, when examining resources in the context of the growing and diverse universe of facilities that EPA and the states must address, policymakers must still make difficult choices

between a growing prevention (permitting and inspections) program and a rapidly growing corrective action program, between a hazardous waste program and an emerging municipal solid waste program, and between shifting resources to address waste minimization at a large number of facilities that generate waste versus maintaining a strong emphasis and presence at facilities that treat, store, and dispose of waste. We will look at these choices under the broad categories of resources management and human resources.

Methodology

The Resources Subcommittee developed a survey questionnaire and distributed about 650 copies to RCRA technical and legal staff in all ten regions and to a portion of the headquarters staff. Over 550 people answered the survey, resulting in a response rate in excess of 80 percent. In addition, the Subcommittee conducted focus group interviews, involving supervisors and program managers, in five regions and eleven states. Budget and work year estimates were obtained from EPA headquarters and the regional offices, and staff turnover data were obtained from the EPA payroll system and from the regional offices. Budget numbers used in this chapter through fiscal 1989

FIGURE 21



are based on "Congressional actuals" obtained from the Budget Analysis Resource System. Some of the historical figures have been adjusted to reflect organizational shifts (e.g., resources for underground storage tanks are removed from early budgets).

The numbers for fiscal 1990 and 1991 resources represent estimates, and are based on the proposed resources in the fiscal 1991 President's Budget. As such, fiscal 1991 projections are subject to Congressional change or approval. They are presented to show the *potential* increase in federal and state resources for the upcoming fiscal year.

Findings and Recommendations

A number of the findings of the Resources Subcommittee are directly related to findings and recommendations of other subcommittees. Because some of these findings are considered critical to addressing the central resource management issues identified earlier in this chapter, they are briefly discussed below; however, an attempt has been made not to repeat discussions or recommendations appearing in previous chapters. Where additional recommendations were identified, they are presented.

Resources Management

The findings related to resources management concern the needs for matching the program's priorities with available resources, balancing prevention and cleanup activities, reducing reliance on contractors, making more effective use of combined federal and state resources, and balancing resources among headquarters, the regions, and the states.

Priorities Should Be Matched with Available Resources

FINDING: The RCRA program has both multiple and competing priorities that in the aggregate lead to unreasonable expectations. Also, new program requirements, created by statutory and regulatory actions, often displace existing RCRA activities without conscious decisions regarding whether the shift in resources produces optimal environmental results.

DISCUSSION: Every year, the Office of Solid Waste and Emergency Response issues RCRA program guidance. Called the Agency Operating Guidance

(AOG), this document identifies national priorities and all the activities that support a comprehensive RCRA program. In many cases, the AOG fails to adequately consider available or projected resources, as evidenced by a number of activities identified in the guidance that are not reflected in the budget. As a result, the AOG creates expectations that cannot be achieved.

This problem is compounded by the fact that resources required to implement new program requirements are not adequately included in EPA's budget or, if included, are not ultimately approved. Where resources are not approved to implement new requirements, EPA has not made conscious decisions regarding the competing demands of the new and existing programs. This has resulted in pressure on the regions and states to "do it all."

Many commenters attributed these problems to the lack of a long-term plan that effectively makes choices between conflicting priorities of major program elements (such as waste minimization, permitting, enforcement, corrective action, and state authorization). Such a plan is needed as a consistent and uniform guide for developing budget and guidance documents, for writing regulations, and for implementing the program at all levels.

RECOMMENDATIONS:

- Develop a long-term strategic plan for RCRA's hazardous waste program that links environmental priorities, environmental results, and available resources and that makes clearly identifiable choices between competing priorities.
- Improve EPA's analyses for estimating the resource impacts of new regulations or program initiatives.
- If adequate resources are not approved in the budget for implementing new requirements, make conscious decisions regarding new program implementation and displacement of existing program activities. Base these choices on a comparative risk analysis, clearly convey them to the regions and the states, and incorporate them into governing strategic plans, budget requests, and operating guidance.

Prevention and Cleanup Activities Need Balancing

FINDING: As currently operated, the RCRA cleanup program could overwhelm the prevention (waste

minimization and regulatory) program if not carefully managed and controlled.

DISCUSSION: If total resources remain constant and current trends continue, EPA and the states will soon face a critical choice: fall behind in the ability to prevent pollution through waste minimization, enforcement, inspections, and/or permit activities, or find a way to control and manage the burgeoning workload to clean up sites already contaminated with hazardous waste.

The increases in corrective action, relative to prevention activities, clearly show the challenges and competing demands confronting EPA. In 1985, hardly any resources were devoted to corrective action. However, as Figure 22 shows, in comparison with the regional work years allocated to permitting and enforcement activities, corrective action is becoming an increasingly large component of the regional work year budget.

The potential demand for higher levels of corrective action resources looms even greater in the outyears. As seen in Figure 23, the number of facilities initiating corrective action, and the resulting demand for corrective action oversight resources, are expected to increase significantly over the next several years if EPA attempts to address all operating and closed facilities that have environmental releases without regard to the varying degrees and immediacy of risk posed by the individual sites. This demand is driven by several factors: the approximately 1,000 closed

land disposal facilities, which will require post-closure permits or corrective action orders; the 1992 permitting deadline for approximately 1,600 storage and treatment facilities; new facilities entering the RCRA regulatory system from the promulgation of new regulations, such as the Toxicity Characteristic Leaching Procedure rule; and oversight cost estimates comparable to Superfund's.

Maintaining the appropriate balance between corrective action and prevention is perhaps the central challenge in the RCRA program today. The primary issue is how to manage the corrective action program so that sufficient resources are preserved to maintain an effective prevention program. The principal recommendations for addressing this issue are set out in the Corrective Action chapter of this report. An additional recommendation is to consider using economic or market-based incentives to promote waste minimization and/or pollution prevention.

Program Relies Too Heavily on Contractors

FINDING: EPA's increasing reliance on contractors is undermining the hazardous waste program's effectiveness and efficiency.

DISCUSSION: As EPA's corrective action program has grown, so has the extramural budget for contractors in the regions. Considering the proposed budget for fiscal 1991, the extramural budget (contractor dollars) will have grown eight-fold since 1985, yet the intramural budget (work

FIGURE 22

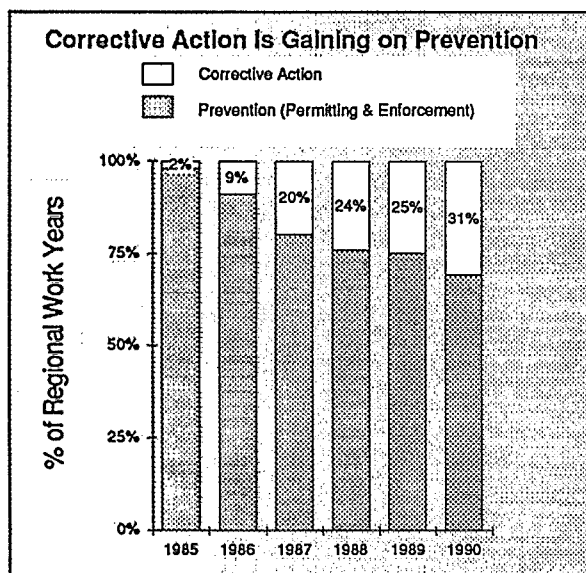


FIGURE 23

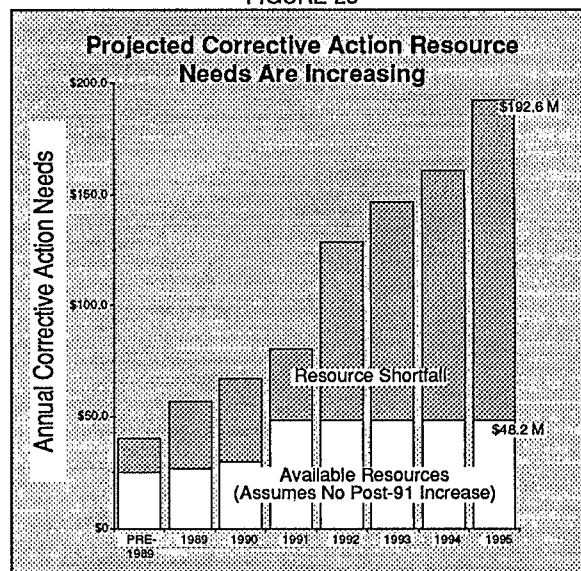
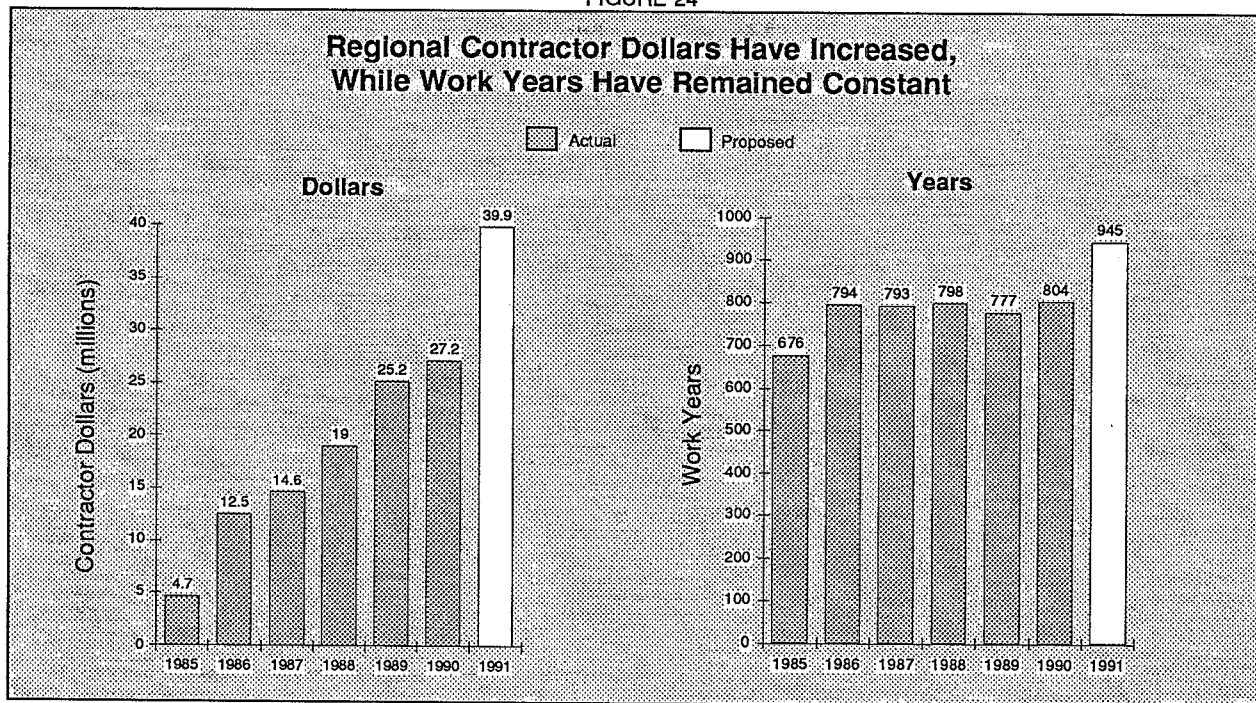


FIGURE 24



years) necessary to manage those dollars has not adequately kept pace. (See Figure 24.)

Both the regions and the states have misgivings about EPA's greater reliance on contractors. RCRA contractors have experienced high turnover rates. As a result, EPA and state staff are often frustrated by the time required to train and oversee contractor employees, many of whom are receiving higher pay. The staff see this as an extremely inefficient use of their time and of scarce program resources. These extramural dollars could be leveraged by a factor of two or three if they could be converted to state grant dollars, or to cover salaries and expenses to hire additional staff or support existing staff in the regions.

Equally important, as extramural dollars increase, functions, skills, and abilities must change. Instead of regional technical/professional staff performing the work themselves, they must manage someone else's work. This effort requires considerable training and experience, as well as a change in focus on the part of staff.

While this blending of technical and administrative functions is not unhealthy, a careful balance must be maintained. Regional RCRA staff are expected to maintain a high degree of technical skill in order to provide effective oversight of state programs and to carry out complex permitting,

compliance, and enforcement functions. A significant decline in regional technical sophistication, as a result of overemphasis on administrative project management, could undermine the effectiveness of the overall state/EPA hazardous waste program.

RECOMMENDATIONS: Move extramural resources to the salaries and expenses appropriation, for better use of overall resources. Convert existing extramural contract resources into state grants and/or personnel salaries to hire more staff.

Federal and State Resources Can Be Better Applied

FINDINGS: The RCRA program currently lacks sufficient flexibility for states and regions to consider local priorities and environmental results. Also, EPA and the states can achieve better resource efficiencies by more clearly defining their respective roles and responsibilities and by improving the state authorization process.

DISCUSSION: Both of these findings are fully discussed and recommendations for them are presented in the Federal/State Alliance chapter of this report. They are briefly mentioned again in this chapter to underline their importance in terms of achieving a more efficient use of combined federal

and state resources. The following recommendations are highlighted based on interviews of regional and state program managers.

RECOMMENDATIONS:

- EPA should decrease emphasis on meeting numerical targets driven by national priorities, if such targets fail to take into account unique regional and local priorities; otherwise, environmental results could be sacrificed.
- The regions and the states must avoid duplicating efforts in implementing program responsibilities.
- Balance the responsibility for overseeing state programs with the responsibility for assisting with state program development and improvement.
- The regions should retain overall responsibility for corrective action in states that lack the desire or ability to take on corrective action program responsibilities.

Resources Need to Be Balanced with Planning

Headquarters/Regional Balance

FINDING: The current balance in resources between headquarters and the regions appears appropriate.

DISCUSSION: In fiscal 1985, headquarters work years represented 28% of the total EPA RCRA federal work force. In the proposed budget for fiscal 1991, this picture would change somewhat, with a 3% shift away from headquarters toward the regions. Clearly, the demands placed on the implementors of the RCRA program are growing, with the imposition of new regulatory requirements and corrective action at more and more facilities. Conversely, considering the maturity of the RCRA hazardous waste regulatory program, the workload at headquarters could be viewed as level or even declining. However, when other factors, such as RCRA reauthorization, municipal solid waste, large-quantity wastes, and pollution prevention are considered, the current allocations appear appropriate.

RECOMMENDATION: In future budget years, take into account the evolution of the program in determining the appropriate allocation of resources between headquarters and the regions.

EPA/State Balance

FINDING: The actual balance between EPA and state resources is possibly in conflict with planning assumptions.

DISCUSSION: EPA does not generate national information on what is purchased at the state level with the grant funds. Although annual state-by-state work plans are negotiated between the regions and the states, these documents have not been analyzed by EPA to produce national summary data on, for example, the number of state staff at work in the RCRA program, or the cost at the state level of managing the RCRA information system.

Compounding this lack of understanding about what is purchased with the grant funds are two more variables. First, the cost per work year varies greatly from state to state, ranging as low as \$35,000 to over \$90,000. Second, the state contribution to the program in many cases exceeds the 25% minimum and in some cases may be as high as 75%-85%. Survey data from the Association of State and Territorial Solid Waste Management Officials suggest that the average state contribution may be in the range of 40%. Given these two variables, it is currently impossible for headquarters to determine with accuracy how many staff are at work in the states on the hazardous waste program. As a result, it is very difficult for EPA to develop good budget estimates.

RECOMMENDATIONS:

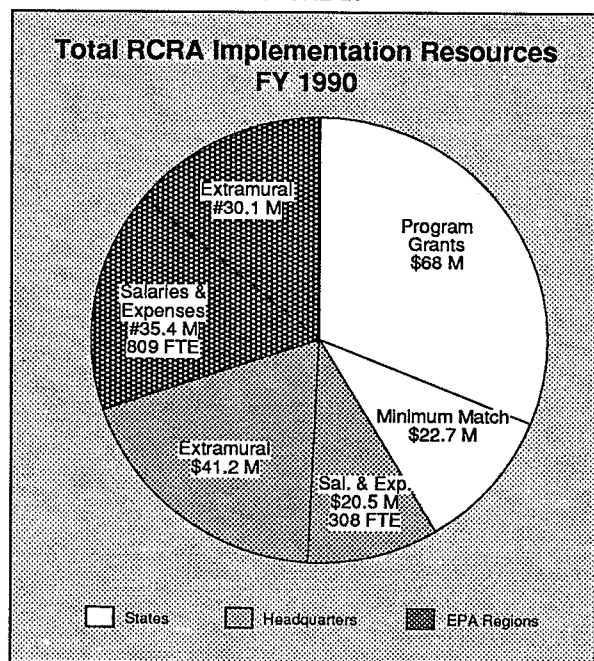
- Refine the planning/budgeting process to more accurately estimate regional and state grant resources, and salaries and expenses for regional staff.
- Evaluate how grant resources are spent, with headquarters developing a national report for use in making future projections and budget requests.

State Roles/Budget Disconnect

FINDING: The budget and guidance processes fail to adequately recognize that the states are more than implementation organizations like the regions.

DISCUSSION: States also operate as both headquarters and regional organizations, with sizable rulemaking, policy development, and legislative interface responsibilities and other non-output oriented work. Figure 25 shows the total resources (headquarters, the regions, and the states) for fiscal 1990. For purposes of this illustration,

FIGURE 25



headquarters and regional work years have been converted to dollars, and a state match of 25% has been assumed.

EPA contract dollars (headquarters and regions) total over \$71 million, slightly exceeding the level of state grant funding. When added to the funding available for work years, the resources at EPA (headquarters and the regions) comprise over half of the total resources available to EPA and the states for RCRA implementation. Yet EPA's basic assumptions about RCRA implementation is that the states implement 85% of the base program and 50% of the corrective action program.

RECOMMENDATION: Shift the allocation of resources and program responsibilities between EPA and the states to more accurately reflect the full scope of state program responsibilities and activities.

Legal Imbalance

FINDING: Legal resources lag behind program resources.

DISCUSSION: Because the headquarters budget process does not directly link Office of Regional Counsel (ORC) workload estimates with the program's (OSWER) enforcement workload, the increases in program compliance and enforcement resources have outpaced ORC increases. The result has been a growing gap between the two activities,

thus slowing down the development and completion of enforcement cases in some regions. Regional Counsel resources are also insufficient in many regions to sufficiently review corrective action permits for enforceability or for mitigation of permit appeals.

RECOMMENDATION: Develop Office of Regional Counsel/Office of Enforcement staff workload projections and budget requests more closely with the OSWER budget process.

Human Resources

The findings related to human resources include the need for reversing high staff turnover and internal loss rates, restructuring the EPA training program, boosting funding for salaries and expenses, and streamlining the process for recruiting and hiring EPA employees.

Staff Losses to Other EPA Programs Are High

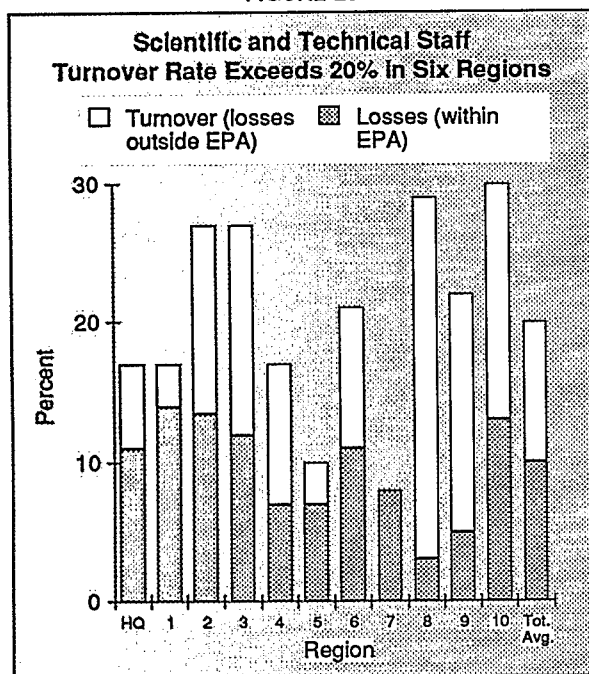
FINDING: While RCRA staff "turnover" from EPA to outside organizations is within an acceptable range, staff "losses" to other EPA programs are relatively high and may get worse absent additional incentives for RCRA staff to remain with the program.

DISCUSSION: The survey found that 70.5% of the RCRA professional staff and supervisors were generally to very satisfied with their jobs in the RCRA program. It was also revealed that 43.4% of the staff described their current morale as high to very high, 15.5% as low, and 3.8% as very low. However, the overall tenor of job satisfaction and high morale is not translating into a strong desire among the staff to stay with the RCRA program.

Losses among scientific and technical staff (i.e., permit writers and compliance officers) have been disproportionately high. While the turnover rate of scientific and technical RCRA employees leaving EPA was 9.6%, the fiscal 1989 overall loss rate for the scientific and technical staff (including transfers within EPA) in the RCRA program was 20.3%, with six regions having loss rates above 20% (see Figure 26). A significant share of these losses was due to a migration of RCRA staff to the Superfund program. Internal losses to Superfund and other EPA programs approached 50% of total losses in seven of the ten regions.

Of the RCRA professional staff surveyed, 52.3% have actively sought other employment, and 85.7%

FIGURE 26



of these individuals have done so within the last 12 months. In terms of looking for non-RCRA employment, the survey found that 81.4% of the RCRA staff cited an immediate increase in salary as a reason, with 59.1% seeing it as a major reason; 94.5% feel that they have more opportunity for future advancement outside of RCRA, with 77.7% seeing it as a major reason; and 92.8% believe that they can receive more career development elsewhere, with 75.8% feeling it to be a major reason. In addition, 72% of the professional staff surveyed believe their positions do not have a well-defined career path. In the focus group interviews, the RCRA supervisors commented that the high loss rate that exists is due in large part to a topping out of their scientific and technical nonsupervisory staff at GS-12.

In the focus group interviews, all the regions identified the migration from RCRA to Superfund to be a growing concern, chiefly because of the recently approved Superfund salary structure, and the initiative in Superfund to increase staff level by 500 work years. This concern is substantiated by the statistics, which show not only that eight of the ten regions have suffered substantial losses to Superfund, but that 48.8% of RCRA staff seeking other employment are looking toward the Superfund program, while only 45.7% are looking at other EPA positions.

Of the states interviewed in the focus groups, many (but not all) indicated that turnover is a severe problem for their programs. In many cases, the problem of salary structure contributes to an even higher turnover than exists in the EPA RCRA program. With the exception of state RCRA programs with salary structures higher than EPA, all states indicated that keeping employees for more than a couple of years was becoming increasingly more difficult. The states believe that this is hurting their ability to fulfill their RCRA mandate, and is not being taken into account by the EPA regions.

The Subcommittee found it very difficult to obtain reliable data on total staff losses in the RCRA program, particularly losses to other EPA programs. While EPA's systems have the capability to profile data based on job functions (as they do for Superfund On-Scene Coordinators and Remedial Project Managers), they cannot currently do this for RCRA job functions because a process does not exist to gather the necessary data for entry into the data system.

RECOMMENDATIONS:

- Create additional incentives to persuade qualified professional RCRA staff to remain with the RCRA program.
- Establish grade structures and levels for RCRA Corrective Action Officers that are equivalent to those for Superfund professional and technical staff. Also, raise the grade level of select compliance, enforcement, permit writer, and other professional staff positions to GS-13 where warranted by complexity of site or other program responsibilities.
- Improve "support" for RCRA staff in the areas of travel, training, and personal computers.
- Enhance the use of EPA's award systems to recognize outstanding job performance or special initiatives.
- Recognize high staff turnover rates in many state programs by making appropriate allowances in terms of training needs, technical assistance, and oversight.
- Consider establishing a better information base for managing RCRA resources (e.g., determining trends in staff retention and experience levels by job function).

Training Opportunities Need to Be Expanded

FINDING: Although EPA-sponsored or EPA-conducted training is highly regarded, it is not readily available to all the staff who need it.

DISCUSSION: Over 60% of the respondents to the survey have been satisfied or highly satisfied with EPA-sponsored courses. However, the survey also revealed strong negative perceptions concerning training: 59.8% of the RCRA staff believe training funds are insufficient; 70.1% believe that budgetary restrictions prevent them from taking needed training; 52.5% think that relevant courses are not well publicized; and 73.7% feel that EPA does not sponsor enough relevant training.

As Figure 27 shows, in each of nine separate training categories, over 65% of the RCRA staff think that a need exists, but in all except one category, less than 35% have received such training. Relative to the one exception noted, 93.4% of the RCRA technical staff believe that a need exists for basic RCRA training within the first several months of employment. However, only 48.0% have received such training.

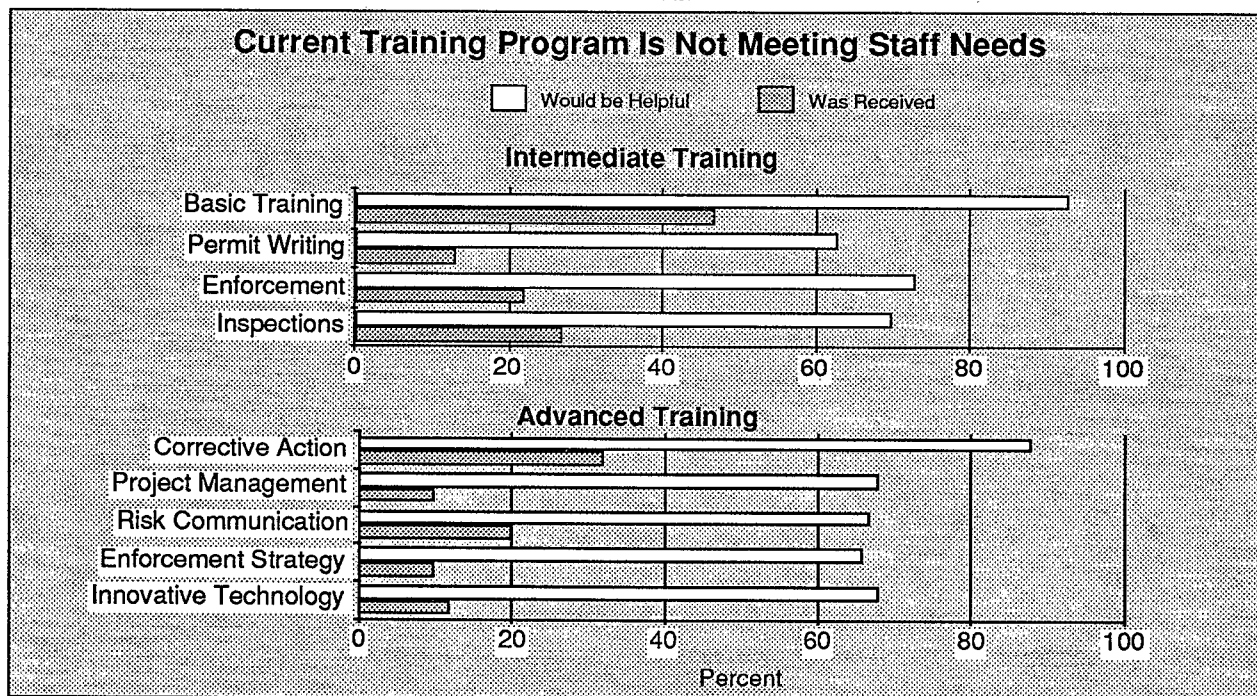
States rely heavily on EPA for their training needs, but have found it to be rarely given in a

timely manner, poorly scheduled, too dependent on contractors and often closed to state staff because of the lack of slots. Also, the unavailability of travel funds has consistently prevented them from participating in available training. Many of the EPA regional supervisors also believe this is a problem, while 60.4% of the RCRA staff think the lack of travel funds for training has impaired their ability to do their jobs. Finally, both the regions and the states think that RCRA has not adequately used relevant Superfund training opportunities.

RECOMMENDATIONS: Create a more focused and centrally coordinated approach to training in RCRA:

- Establish a centralized RCRA training office in headquarters responsible for planning, management, development, and implementation of a coordinated national training curriculum designed to meet the needs of headquarters, regional, and state programs. To support a centralized RCRA training program:
 - Move extramural money (grants, contracts) into a RCRA training budget, for needed staffing and short-term contract support.
 - Incorporate the funds into the fiscal 1992 budget work year and other resource needs.

FIGURE 27



- Provide for a more structured curriculum tailored to specific job functions and experience levels of program personnel.
- Establish minimum training standards for new and existing EPA and state staff, and seek funding to support these standards.
- Use the expertise of EPA field staff in the regions, states, and headquarters, as opposed to generic contractor-training support.
- Make Superfund training available to RCRA staff, in conjunction with joint funding, in areas that overlap the two programs.
- Ensure timely training on new RCRA regulations, using existing communications systems and expert operating systems (such as video technology/satellite teleconferences).
- Expand the use of RCRA training centers, including the EPA Inspector Institute, while also considering the needs of those states constrained by out-of-state travel.

Funding for Salaries and Expenses Needs Boosting

FINDING: In the past several years, EPA has experienced shortfalls in its funding for salaries and expenses (S&E).

DISCUSSION: One concern frequently raised in the focus group interviews was that insufficient funding is provided to the regions in support of RCRA work years. However, this comment is often made in the context of comparisons to Superfund, which is funded from a special account and not S&E program funds.

A primary reason for the shortfall in fiscal 1989 was Congressional approval of a 4.1% federal pay raise, with no provision for additional funding to cover the added costs. Consequently, for nearly all of fiscal 1989, the regions were compelled to meet their S&E shortfalls by cutting back on hiring of full-time and temporary personnel, travel and training, equipment (i.e., computers), and furniture. In fiscal 1989, one region could hire to only 91.5% of its authorized position ceiling, another region to only 92%, and a third region was subject to a hiring freeze as a result of these funding constraints.

In fiscal 1990, the regional deficit has continued, based on a number of factors, especially the budget reductions resulting from the Gramm-Rudman-Hollings and Section 516 Congressional cuts. As in

fiscal 1989, the reductions cut more deeply in the S&E programs, rather than Superfund, because Superfund has the option to take the cuts from its large extramural/contract funding categories. To address these shortfalls, eight regions have imposed S&E hiring freezes, ranging from 2% to 10% of their authorized position ceilings, and most have delayed purchases of personal computers (PCs), have restricted travel and training, and have cut back on other types of expenses.

Survey data substantiated these findings: 51.6% of the RCRA professional staff felt that they did not have adequate PC resources; 60% of them saw it as a major problem; 60.4% of the staff felt that travel funds were inadequate, 55.4% of whom saw it as a major problem; and 62.4% of the staff felt that training funds were inadequate, 54.2% of whom saw it to be a major problem in their ability to do their job.

Focus group interviews also substantiated these findings. Supervisors felt that their S&E budgets were not adequate to support promotions and hiring, training and travel needs, and field work and outreach.

Most regional staff also felt that they did not have adequate support for managing their records and files. Many felt that too much of their time was spent doing clerical work, detracting from their ability to do essential RCRA work. RCRA staff also felt that they lacked the PCs necessary to maintain the system's consistency or uniformity of compliance monitoring, and data management.

In addition, managing the files for Freedom of Information Act (FOIA) requests is seen as being incredibly labor intensive and demoralizing in terms of the time they take away from staff's respective jobs.

In the President's budget proposed for fiscal 1991, S&E funding is increased by approximately \$5,000 per work year. If funded, this should help mitigate some of these problems occurring during the current S&E shortfall.

RECOMMENDATIONS:

- Ensure that future budget requests include S&E funding levels adequate to meet salary and expenses, training, travel, equipment, and other support needs for RCRA staff. Develop strategies to ensure that any increase in S&E funding approved in fiscal 1991 for RCRA is used in support of RCRA program needs.

- Consider all available means of converting extramural contract dollars to S&E for travel, equipment, and personnel compensation and benefits.
- Use extramural dollars directly for managing files and records, FOIA requests, and the Senior Environmental Employee program.
- Charge realistic (i.e., higher) costs for processing FOIA responses.

Process for Hiring and Recruiting Needs Streamlining

FINDING: Federal administrative hiring procedures impede regional programs in achieving the desired skill mix in some areas.

DISCUSSION: The federal hiring process has historically required EPA to work through an elaborate and time-consuming competitive process in order to fill most jobs. Direct-hire authority has existed for engineers, but generally not for other disciplines. Delays and the inability to reach the right candidates through the competitive process have motivated supervisors to hire a disproportionate number of engineers, instead of seeking a more balanced skill mix among their professional positions.

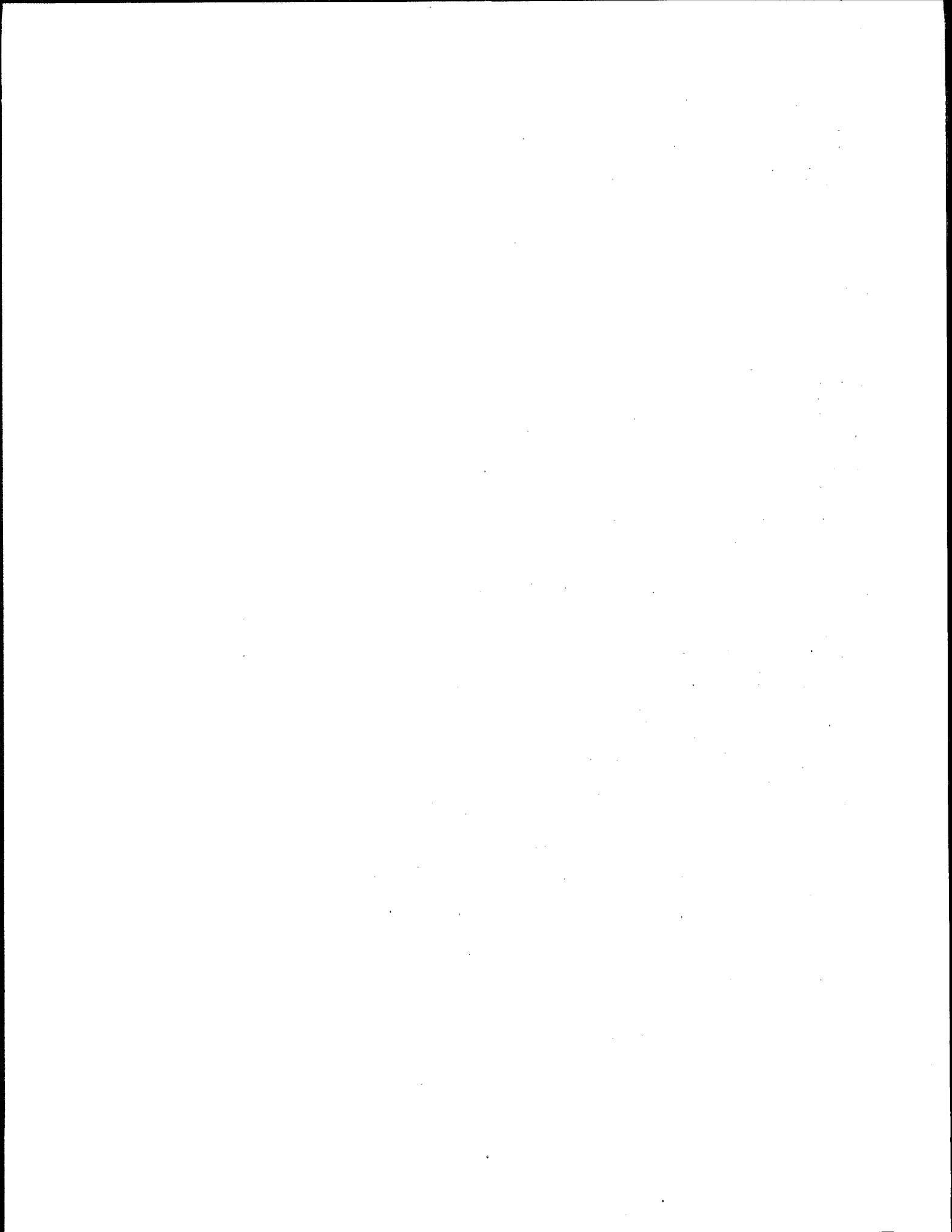
The regions indicated that they are otherwise able to find the people with the necessary technical skills. Some exceptions are that toxicologists and

hydrogeologists are harder to find in some geographic areas, and it has been more difficult to find candidates with experience in the hazardous waste field, or with skills in enforcement negotiations, project management, community relations, and technical writing.

The salary structure is not high enough to attract most of the experienced candidates. However, in certain geographic areas, a regional economic downturn (e.g., the oil bust) has brought some very experienced people into the hazardous waste field. This is true especially for engineers.

The regions and the states have not found identifying and hiring female candidates for professional positions to be a problem. However, the identification and employment of minority candidates has been much more difficult. Recently, the Office of Personnel Management (OPM) has instituted regional direct-hire job fairs, in which qualified candidates, in a variety of scientific and technical fields may be hired directly if they have had contact with the hiring agency. These direct-hire job fairs have proven to be useful in many regions and states in finding minority candidates and could significantly alleviate problems with the competitive process for hiring non-engineering candidates.

RECOMMENDATION: Seek direct-hire authority for as many occupations as possible, and/or encourage OPM to increase the frequency and coverage of direct-hire job fairs.





CHAPTER 9

Information Management: Data to Measure Progress

Introduction

In a program as large and as complex as RCRA, effective management of its information is critical to its success. Congress and the General Accounting Office have frequently criticized the RCRA program for not understanding the universe of facilities it is charged with regulating, for not knowing the types and amounts of wastes being generated and managed, and for not being current on the compliance status of regulated facilities. The RCRA program must ensure that timely and reliable information is available to define environmental problems and to develop goals, objectives, and priorities for managing these problems.

Information required for the RCRA program can be divided into four general categories:

- *Environmental:* information describing the environmental problems that RCRA is intended to address, and the effect of the program in mitigating these problems. We use the term "environmental information" broadly in the context of the RCRA program to encompass both genuine environmental information (e.g., environmental releases and site cleanup results) as well as proxy environmental information (e.g., waste characteristics and management patterns).
- *Activity tracking:* information describing state and EPA activities in carrying out functions associated with developing and implementing the program (e.g., writing regulations, issuing permits, conducting inspections and enforcement actions, delegating program authorities to states, and providing technical assistance), and describing the regulatory and compliance status of the RCRA-regulated universe.
- *Technical:* information describing and supporting models and technologies, such as ground-water models and treatment technologies.
- *Administrative:* information describing the personnel, financial, and property resources associated with the program.

Findings and Recommendations

Insufficient Environmental Information

FINDING: The RCRA program does not have adequate information to set environmentally based goals and objectives and to measure or report progress toward their attainment.

DISCUSSION: The RCRA program lacks a comprehensive baseline of information on the processes that generate hazardous waste, the amounts generated, waste minimization methods, and the processes used to manage the waste. There is no regular information collection effort to provide data to set goals and objectives and to measure progress. The program is unable to define the nature of risks associated with particular wastes or industries. Data on unregulated wastes that are of concern are not readily available.

This absence of data is most evident in the OSWER Strategic Plan for FY 1992-1995. Most of the objectives in the plan are related to program development, and success is measured in terms of completion of program activities, such as writing and promulgating new regulations. Measures that the RCRA program tracks in EPA's Strategically Targeted Activities for Results System are also based on completion of program activities, rather than on improvements in the program's efficiency and effectiveness.

The RCRA program relies on a group of fragmented and largely unrelated information systems and data bases. Until 1987, the major data base to support regulatory development was a survey of hazardous waste treatment, storage, and disposal facilities conducted in 1981. In 1987, the

program first had access to data from the 1986 surveys of generators and of treatment, storage, disposal, and recycling facilities. These surveys have not been used to their full potential because of lack of quality assurance and lack of accessibility.

The program has also not successfully used another reporting mechanism, the RCRA Biennial Report, to track progress in waste generation and management. The Biennial Report data for 1981 and 1983 contained too many problems to be used to produce national reports. Thus, in 1986, the RCRA program decided to make major improvements based on the "two-domain" concept of the states and EPA sharing data. One goal of the effort was to produce a detailed national data base to track waste generation, minimization, treatment, disposal, and capacity at each facility.

Despite those improvements, the Biennial Report lacks a clear role in the RCRA program because of the lack of environmentally based goals and objectives. Nevertheless, states have already used Biennial Report data to support their capacity certifications required by the Superfund Amendments and Reauthorization Act (SARA), and the RCRA program has made the support of these certifications a high priority.

Our interviews identified a high degree of support for the RCRA program to collect and maintain the kinds of data that are being collected by the Biennial Report. Most people interviewed identified specific data that would be of use to them in managing their portions of the RCRA program.

The Biennial Report has the potential to provide the regular, ongoing data needed to track the environmental progress of the RCRA program and to measure the success of multiple program goals. It can provide data to support the development of regulations and to evaluate their environmental impact after their implementation. It can also provide the basis for setting environmentally based permitting and compliance priorities and for evaluating waste minimization efforts.

Finally, the RCRA program has demonstrated that it can develop adequate information when it has set clear goals and objectives. The most prominent example of this is the program's success in tracking permitting and compliance activities.

RECOMMENDATIONS:

- Define environmentally based goals and objectives, and incorporate them into the OSWER Strategic Plan.
- Establish a system for measuring success.
- Develop an information management strategy that will provide the blueprint for collection and management of environmental information to measure success. As part of this strategy, determine:
 - which program functions are best supported by regular data collection, and which are best supported by special surveys;
 - the information management roles of headquarters, the regions, and the states; and
 - which data collection efforts are best administered directly by EPA, and which are best administered by the states.
- Revise the reward system to encourage staff and managers to meet environmental targets as well as to complete program activities. RCRA staff and managers need to be able to explain the environmental impact of regulations and other actions.
- Continue to develop the Biennial Report. Target it to support the SARA capacity certification process until its role in supporting multiple program goals can be clearly defined.

Advances in Activity Tracking Information

FINDING: Since 1985, the RCRA program has substantially improved its ability to track program activities. Nevertheless, shortcomings continue to impede progress in this area.

DISCUSSION: Since 1985, the RCRA program has used the Hazardous Waste Data Management System (HWDMS) to track its activities. The system provides reliable data about the status of permitting and compliance. However, HWDMS is difficult to use because it is based on outdated software systems, it is designed to mainly support EPA headquarters, and the regions have a difficult time entering data. As a result, there is a general lack of confidence in HWDMS data. Thus, data retrieved from it must be subjected to careful quality assurance checks.

To solve the problems of HWDMS, the RCRA program is developing the Resource Conservation and Recovery Information System (RCRIS). Based on the concept of state and EPA data sharing, this new system will enable the RCRA program to support state, regional, and headquarters information management needs.

RCRA managers have a high level of confidence that RCRIS will be successful. The RCRA program has already invested almost \$15 million in developing the system. National implementation of RCRIS started during fiscal 1991 and is expected to be complete in fiscal 1993.

There are currently no major information gaps that limit the RCRA program's ability to track permitting and compliance status and set priorities for accomplishing these activities. Currently, priorities are set by statute. However, there is a clear trend toward setting future priorities based on environmental significance. This will require the ability to relate data in activity tracking systems to environmental data.

RECOMMENDATION: Continue to implement RCRIS and to provide adequate resources (about \$3 million per year) and management attention in headquarters, the regions, and the states to ensure its success.

Inconsistent Technical Information Support

FINDING: The RCRA program does not provide consistent technical support to the regions and the states.

DISCUSSION: An OSWER study has identified 311 models used by headquarters and regional staff for RCRA and Superfund. Of these models, 245 deal with ground water. The study found that there is no consistent system to support RCRA and Superfund staff in selecting and applying models, and in reviewing their use by industry. Because of the common use of some of these models by RCRA and Superfund, there is the potential to integrate their support and to provide common information clearinghouses, particularly for corrective action. The Alternative Treatment Technology Information Clearinghouse (ATTIC) is an example of a clearinghouse that could be used jointly by RCRA and Superfund.

The use of expert systems technology is still in its infancy within EPA, and the development costs are high. However, expert systems have the potential to improve technical support and help resolve the problem of high turnover of senior staff and loss of institutional knowledge and expertise. OSWER and the Office of Research and Development have begun developing a number of expert systems applications, eight of which can be used to review permit applications. Expert systems that are implemented should be carefully evaluated.

The regions and the states also need better tools to help them set priorities based on environmental significance. For example, Geographical Information Systems (GIS) have the potential to improve the ability to evaluate environmental data and to display multi-media relationships. Despite the large initial investment these systems require in hardware, software, and training, several regions have already implemented them and are strong supporters of their use, especially for corrective action.

RECOMMENDATIONS:

- Continue to develop expert systems to support regional and state permit writers.
- Develop GIS capability to support priority-setting.
- Improve modeling support, and provide information clearinghouses through integration with Superfund.

Work Force Information

FINDING: The RCRA program needs better information to manage its human resources.

DISCUSSION: The RCRA program does not have information on the experience levels of its work force, the reasons for the program's high turnover rate, and the real allocation of personnel and other resources in headquarters and the regional offices. Agency-wide systems are best suited to maintain this information. However, none of EPA's systems currently maintains this information, and setting up a complete information system that includes the program's human resources both at headquarters and in the regions will take a long time.

RECOMMENDATIONS:

- Identify the RCRA program's administrative information needs to the offices responsible for EPA's information systems.
- To meet the program's immediate needs in the interim, begin to collect and maintain data necessary to better manage human resources.

Building on Existing Resources

FINDING: The RCRA program can leverage its information management resources by building on and integrating with existing processes and by

finding lower-cost solutions to information management problems.

RECOMMENDATIONS:

- Build information management accountability into existing activities. One example requires each regulatory development effort to have an information management plan that describes how data will be collected, quality assured, maintained, and made accessible after the effort is complete.
- Develop small microcomputer-based systems when more costly, larger national systems are not warranted. For example, maintaining ground-water data in a standard format on microcomputers by regions would facilitate the transfer of the data for other uses (such as ground-water modeling) and would reduce the cost of central maintenance and support.
- Require the regulated community (possibly by regulatory changes) to report data to EPA and the states in a standard electronic reporting format. Provide automated tools to the regulated community when possible, allowing them access to EPA systems (with appropriate security) to directly enter data. Continue the pilot effort of providing industry with microcomputer software to enter Biennial Report data, and expand this effort to other data collection activities.
- Use Superfund's experience in records management to improve RCRA records management.
- Use the Toxic Release Inventory (TRI) mechanism to collect data for RCRA facilities. Although TRI data are fundamentally different from RCRA data, there is an opportunity to integrate RCRA data collection for some facilities with the TRI mechanism, if senior managers in both the RCRA and toxic substances programs agree it is a high priority.



CHAPTER 10

Science and Technology: Breaking Barriers

Introduction

EPA has made considerable progress in meeting the technical needs of the RCRA program. Comprehensive requirements have been established for the design of landfills, including covers, liners, and leachate collection systems. Ground-water monitoring requirements have been developed, and an intensive methods development program was initiated by the Office of Research and Development (ORD) to fill a large void in our analytical capabilities. Soil and ground-water fate and transport models have been developed, and "best demonstrated available technology" has been defined for a large number of hazardous wastes.

While much has been accomplished, several science and technology issues in the above areas must be addressed. For example, cleaning up contaminated subsurface and ground water has proven to be one of the most complex environmental undertakings facing EPA. The subsurface is complicated, difficult, and expensive to understand and remediate. Careful study of the transport processes in the subsurface by public, private, and federal research institutions has indicated that the soil and aquifer matrices are outstandingly effective at retaining many chemical constituents, and then releasing pollutants into the passing ground water over extended periods of time at concentrations that can exceed levels of concern for public health.

The scientific basis for subsurface monitoring, modeling, and remediation is relatively new and consequently subject to substantial uncertainty. The movement and persistence of pollutants in the subsurface are controlled by physical, biological, and chemical processes, that may vary significantly from site to site and from chemical to chemical.

While progress has been made in these areas, our basic understanding must be expanded. There also remains a significant gap between what we know and our ability to apply such knowledge at

an individual site or on a national level. This is due in part to the lack of extensive data bases that fully incorporate the physical, biological, and chemical processes that we know operate in the subsurface into our assessment, predictive, and decision-making activities.

In the majority of ground-water remediation situations, we require information on the pollutants that are present at a site and their amounts. Unlike other situations, there is no smokestack, tailpipe, or outfall to monitor. This, when combined with the complexities of the subsurface and the significant variability among sites, presents a challenge to devise ways to detect potential problems, devise remediation approaches, and predict the impacts of possible protection programs.

EPA's statement of ground-water protection principles articulates a preference for preventing contamination of ground water, rather than relying on remediation. Pollution prevention must become a focus of future efforts in hazardous waste management. The substantial uncertainty that exists concerning how to characterize and remediate the problem of ground-water contamination at RCRA facilities clearly supports a preventive approach.

This chapter provides an overview of many of the important issues in science and technology related to EPA's ability to implement the RCRA program. It focuses on our current capabilities and areas where advances or improvements in the state of the science, as it is practiced in the field, are needed. In some cases, significant progress can be made by improving technology transfer and technical assistance; in others, advances in the basic science or technology are needed. Many of the areas discussed (e.g., modeling, risk assessment, technology transfer) are undergoing more in-depth consideration. Consequently, further refinements of the findings in this chapter are expected.

Findings and Recommendations

Technology Transfer and Technical Assistance Programs

The technology transfer and technical assistance needs of the RCRA program are in the following areas: site characterization, fate and transport modeling, risk and exposure assessment for both human and environmental health, and evaluation of corrective measures.

ORD currently provides direct RCRA technical assistance to regional offices and states on an ad hoc basis; no comprehensive or structured program exists. Although ORD labs have occasionally provided long-term technical support for specific sites or problems, most responses to regional and state requests are quite limited in scope. Some of the most frequent requests require expertise in ground-water monitoring, modeling, and cleanup; waste combustor stack emissions methods; landfill construction and monitoring; detection of leaks from underground storage tanks; control of organic emissions; and bioremediation.

Current RCRA corrective action technology transfer projects include handbooks and seminars covering such subjects as toxic emissions from incinerators, subsurface remediation techniques, soil vacuum extraction, remedial action costing procedures, and selection of PC-based ground-water models. Several RCRA technology transfer projects underway are designed to assist owners and operators of treatment, storage, and disposal facilities in complying with corrective action orders (Section 3008(h)) and corrective action requirements for permit compliance (Section 3004).

Superfund Programs Can Be Adapted for RCRA Needs

FINDING: Several of the technology transfer and technical assistance programs established to serve the Superfund program have the expertise in place to meet the needs of the RCRA program. However, because of the statutory limitations on the use of Superfund resources, the availability of these capabilities to the RCRA program is limited.

DISCUSSION: The audience for RCRA information includes regional personnel, state agency staff, and the regulated community. The overall size of the

RCRA end-user population is difficult to assess. Estimates range from 1,500-2,000 for state agency staff to several hundred thousand for the regulated communities. There are an estimated 500-1,000 regional and state permit writers, 5,700 owners and operators of hazardous waste landfills, and 50,000 generators of hazardous waste.

ORD and OSWER have established technical support centers for the Superfund program at four ORD laboratories and the Superfund Technical Assistance Response Team (START). The centers provide direct technical assistance in all technical areas, and the START provides assistance in selecting remedies and in conducting treatability studies. The needs of the RCRA program, particularly in corrective action, are in many cases essentially identical to those of Superfund. These activities can easily be adapted to the RCRA program, providing immediate technical assistance capability to regional and state RCRA programs.

The Superfund Innovative Technology Evaluation (SITE) program will continue to conduct field demonstrations of innovative hazardous waste cleanup technologies. Results of these performance evaluations are available to RCRA staff as well as to owners and operators of treatment, storage, and disposal facilities, and to the design engineering community.

Finally, ORD is working with EPA's Office of Emergency and Remedial Response (OERR) to test and complete a number of expert systems. There is no structured activity to ensure the comprehensive availability of the expert systems developed under either RCRA or Superfund to regional and state staff who will be reviewing RCRA permits and corrective action plans. Expert systems could be marketed widely, with training provided, and the experience gained from using these systems in the field could be fed back to the systems' developers. EPA could also initiate an active outreach program to the private sector.

RECOMMENDATIONS:

- Provide RCRA funding for a portion of each technical support center's activities and START.
- Establish a technology transfer strategy for making SITE and other appropriate technologies known to the large RCRA audience.

Guidance on Geological and Hydrological Site Characterization Should Be Integrated

FINDING: Guidance for conducting geological and hydrological site characterizations is scattered in many different documents, regulations, and methods manuals.

DISCUSSION: Different facets of geological and hydrological environments are addressed by many documents, each of which was developed with a single purpose. Some offer overlapping and conflicting approaches to site assessment. Recent research and methods development and demonstration have filled in many gaps. This offers EPA the opportunity to develop one unified approach to site characterization. This would result in reduced training for EPA staff and simpler guidance for the public and regulated industries, and would lend itself to incorporation in university degree programs.

RECOMMENDATION: Develop a unified, integrated geological and hydrological site characterization strategy in support of RCRA and Superfund.

RCRA Risk Issues

Risk assessment is the key to ensuring that each facet of the RCRA program is protective of human health and the environment. Currently, risk assessment is used for the listing and delisting of waste streams, the permitting of sites, the petition process, closure and post-closure evaluations, and corrective actions.

Risk Assessment Capabilities Need Improvement

FINDINGS: The risks associated with RCRA hazardous wastes are not fully characterized and may be significant. Both advances in our ability to characterize impacts and better use of the full range of relevant risk assessment tools and capabilities are needed.

DISCUSSION: RCRA oversight encompasses areas with potentially significant public health risks. Real-world exposures involve multiple chemicals and are temporally variable. Risk assessment methods presently used under RCRA tend to be based on simplified assumptions, such as a constant level of exposure to a single chemical.

EPA regional personnel have indicated that improving risk assessment capabilities for specific facilities is a high-priority need. The variability among facilities requires a high level of expertise in applying risk assessment techniques. Guidance on conducting risk assessments must address site variability issues.

While considerable improvements can be made by using existing tools, the emphasis in risk assessment research is to move beyond the use of simplifying assumptions to provide more realistic answers. There is a continuing need to enhance our capability to assess risks associated with chemical mixtures and improve the data base on pharmacokinetics mechanisms of action for many chemicals. An enhanced health research program is also needed to improve these risk assessment activities.

RECOMMENDATIONS:

- Increase the use of risk assessment tools available to the RCRA program, and provide readily accessible, chemical-specific guidance in a timely manner.
- Develop expert systems that can aid the evaluation of specific cases. These systems should contain upper- and lower-bound defaults for each type of input needed, and also allow for inputting site-specific data.
- Increase the emphasis on health research to improve RCRA risk assessments, particularly with regard to chemical mixtures and pharmacokinetics.

Ecological Risks Posed by RCRA Wastes Are Not Being Assessed

FINDING: The RCRA program to date has not made significant use of information on the ecological impacts and risks posed by hazardous wastes and their management.

DISCUSSION: Ecological risk assessment quantifies the likelihood of an adverse ecological effect resulting from a human activity and determines the significance of the effect. EPA's Office of Policy, Planning and Evaluation released a study in 1989 concerning the nature and extent of ecological damages and risks at RCRA and Superfund sites, and assessment methods and management issues

relating to them. Because of the limited data that were available, the study's findings cannot be used to estimate the degree of damage to the environment that is occurring at RCRA sites. The study, however, did observe that Superfund hazardous waste sites can have very intense ecological effects. It is likely that in some cases RCRA hazardous wastes pose similar threats to ecological resources.

Current assessment capabilities are limited, but methods to evaluate the ecological hazards and potential risks of RCRA wastes are available for selected chemicals and animal and plant species. While risk assessments for populations, communities, and whole ecosystems would often be most meaningful in the regulatory process, the scientific basis for exposure and risk assessment at these levels is generally lacking.

A flexible set of assessment tools is needed so that analyses can consider wastes either in a generic sense or in a site-specific situation. The Office of Research and Development is involved in a number of activities seeking to develop standardized assessment methods. These include the multi-laboratory Ecological Risk Assessment Program, initiated to support EPA's Office of Pesticides and Toxic Substances; the Superfund Technology Support Center for Exposure and Ecological Risk Assessment, which provides technical support for the Superfund remedial investigation/feasibility study (RI/FS) program; the Eco-Risk Planning Group, which addresses reducing uncertainties in ecological risk assessments; and the Risk Assessment Forum, which develops guidelines for ecological risk assessments. The RCRA program could address its technical needs by becoming part of these activities.

RECOMMENDATIONS:

- Foster and develop the capability to conduct ecological risk assessment for RCRA facilities.
- Validate and transfer to RCRA program staff currently available biological hazard and risk assessment methods that could be applied to RCRA issues.
- Focus research efforts to develop ecological risk assessment methods that could be applied routinely in the analysis of complex wastes and effects on biological populations, communities, and ecosystems.

Sampling, Monitoring, and Measurement

Measurement and monitoring activities under RCRA are conducted for the following purposes:

- characterizing wastes and sites;
- determining the extent of contamination at sites;
- writing permits and monitoring compliance with them;
- taking corrective action; and
- closure and post-closure monitoring.

The measurement and characterization activities can be classified by contaminated media into three broad areas: (1) hazardous wastes in solids and liquids, (2) gaseous incinerator emissions, and (3) ground-water and soil contamination.

Additional Analytical and Sampling Methods Are Needed

FINDING: Additional methods may need to be developed for newly regulated organic chemicals.

DISCUSSION: Regulations promulgated under RCRA have challenged EPA's methods development capabilities. Analytical methods for solid and liquid wastes have been satisfactorily completed for the initial list of RCRA priority pollutant compounds. The large number of chemicals listed as toxic and hazardous and the broad universe of waste types and environmental media far exceeded the analytical state of the art in the early 1980s. Applicable analytical methods were quickly identified among the air and water programs, and ORD initiated an intensive methods development program to fill the large remaining void in EPA's analytical capabilities. That effort has been largely successful, with completed methods being incorporated in the EPA document "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods," commonly referred to as SW-846.

The validation process for adding methods to SW-846 has been slow, because of the *Federal Register* review and comment procedures. Once a method

is added to SW-846, it is not simple to change. This lack of flexibility can result in methods beyond their limitations or intended purpose, and has caused concern regarding questionable data and the quality of EPA's measurement methods.

RECOMMENDATIONS:

- Continue developing methods for new compounds, and enhance the existing methods as needed. As faster, less expensive alternative methods become available, add them to SW-846.
- Develop methods for assessing bioavailability.

Air Sampling Methods Need to Be Improved

FINDING: Air emission and ambient sampling methods need to be developed and/or improved to meet RCRA implementation needs.

DISCUSSION: The principal needs for air pollutant measurements arise from hazardous waste combustors. These include incinerators, waste-firing boilers, and waste-firing industrial furnaces. Compliance with existing and proposed regulations requires measurement of selected organic compounds to prove adequate destruction efficiency, and measurement of particulates, metals, and hydrochloric acid to prove acceptable emission levels. Carbon monoxide, oxygen, and sometimes total hydrocarbons are monitored continuously to prove adequate combustion efficiency and destruction of products of incomplete combustion. Better continuous monitors, along with better quality control and audit procedures, may help alleviate public concern over the safety of incinerators. Methods are inadequate for many of the organic compounds, and total hydrocarbon monitors require significant improvement.

Finally, ambient air measurements have not been a significant part of the RCRA regulatory program thus far, but are needed to support regulations and to test air models. Ambient methods are being tested on Superfund sites, but will need more research before being fully proven for RCRA applications.

RECOMMENDATION: Develop, validate, and publish improved sampling, analysis, monitoring, and quality control procedures for source and ambient air emission measurements.

Faster Development of Field Sampling and Analysis Methods Is a High Priority

FINDING: Regional and program office staffs have identified rapid, transportable, and portable field sampling and analysis methods as a high-priority need.

DISCUSSION: The traditional approach of collecting samples in the field, shipping them to analytical laboratories, and waiting for the results is expensive and involves a number of delays. The long turnaround times preclude prompt decisions and timely corrective action. Field methods for sample screening and on-site analysis offer great hope for reducing the costs and dramatically shortening the acquisition time for critical information.

Two years ago, the Superfund program initiated the Advanced Field Monitoring Methods Program to identify and demonstrate available technologies to address the problems of high cost and delays in response. This new program has overseen the demonstration of a number of highly promising technologies at hazardous waste sites, which need to be made available for RCRA application.

RECOMMENDATION: As the development and demonstration of rapid monitoring approaches continue under Superfund, a parallel effort to address RCRA needs should be incorporated.

New Monitoring Methods Can Improve the Reliability of Containment Facilities

FINDING: New monitoring approaches can enhance the safety and reliability of containment facilities.

DISCUSSION: A number of research areas offer promise for long-term protection of ground water. These areas include sensitive, specific chemical detectors for real-time and unattended ground-water monitoring; early detection systems—e.g., tracer chemicals, and electronic or fiber optic networks for monitoring the integrity of containments; and telemetry for rapid relay of site conditions to central facilities. These new technologies can be incorporated into new facility designs to enhance safety and reliability.

RECOMMENDATION: Collaborative monitoring and engineering research should evaluate and test monitoring technologies for incorporation into new waste facility designs.

Post-Closure Monitoring Methods Are Needed for Hazardous Waste Facilities

FINDING: Low-cost, highly reliable monitoring techniques are needed to ensure the long-term safety of closed hazardous waste facilities.

DISCUSSION: RCRA regulations require owners and operators to monitor facilities for 30 years after their closure. Numerous waste facilities are being closed, but research to support monitoring guidance for them has lagged behind other research activities. Non-invasive or minimally intrusive techniques will be particularly important, so clay caps and other structures are not disturbed. While a number of geophysical, in situ, and remote-sensing techniques are available, further research, development, and testing are needed.

The Superfund program is committed to reviewing "all sites at least every five years after the initiation of the remedial action where hazardous substances remain on the site."

RECOMMENDATION: Initiate research to develop and adapt technologies for post-closure monitoring in coordination with the Superfund research effort.

Standard Sampling and Analysis Methods Are Needed

FINDING: Standard methods for ground-water and soil sampling and geophysical techniques are essential to advance the state of the art in subsurface site characterization and monitoring.

DISCUSSION: Standard methods are being developed through an EPA-sponsored American Society of Testing and Materials (ASTM) effort, which involves scientists from industry, academia, and government. The formal review process that precedes the designation as a standard ASTM method ensures opportunities for comments and encourages involvement by all concerned parties. EPA has fostered the effort by providing draft protocols and methods from EPA-sponsored research, by providing EPA experts to participate in ASTM activities, and by funding participation of other experts in the standards writing process.

RECOMMENDATION: Continue this joint effort.

Modeling Capability

The RCRA program primarily uses modeling in the following areas:

- to assess exposure assessments as part of risk assessments;
- to develop regulatory levels for national regulations;
- to complete Regulatory Impact Analyses;
- to assess the risk at specific RCRA sites and to design risk reduction programs; and
- to evaluate the performance of designed containment and control systems.

Modeling in the RCRA program can generally be divided into two categories: (1) generic analyses for developing regulatory packages and (2) site-specific modeling for analyzing RCRA facilities. In both cases, a range of modeling can be used—from relatively simple screening-level models to complex state-of-the-art models. EPA uses generic modeling when it is necessary to make decisions on the basis of waste properties and assumptions about how such wastes will be managed. Data for such modeling are often aggregated and scaled to apply to a wide range of environmental conditions, rather than directed to a precise description of any particular site or system. For sites or facilities where site-specific data are available, the models may be adjusted to accommodate local conditions and characteristics.

Table 11 lists the program areas where some form of modeling is used and the scale of the application.

TABLE 11

Several RCRA Program Areas Use Modeling	
<u>Program Area</u>	<u>Level of Analysis</u>
Characteristics	National Scale
Listing/Delisting	Specific Waste Streams at National Scale
Corrective Actions	Site Specific
Subtitle C Siting & Permits	Site Specific

Modeling, as part of regulatory development, is typically conducted under the scrutiny of the public comment process (as implemented by *Federal Register* notices, proposals, etc.) and can include scientific oversight by EPA's Science Advisory Board and various ad hoc groups, including the Office of Research and Development. Site-specific modeling, however, is much more varied. Uniform procedures for scientific review, model selection and validation, quality assurance/quality control of modeling, and site characterization for model parameterization are generally not available.

Models Need Improvement in All Levels of Capability

FINDINGS: Models currently used in RCRA programs vary in type and capability, and there is no program to evaluate, test, and recommend models for specific applications. Further, the capability of field personnel to use models is limited.

DISCUSSION: As can be seen from Table 12, there are several areas where modeling capabilities exist at some level. However, the capability of end-users in the field is generally low, and improvements in all levels of capability are needed. Making such improvements will provide more reliable and accurate assessments for site-specific and national decision making.

Enhancing our ability to address chemical and biological transformations could significantly improve model predictions concerning the concentrations and ultimate exposure levels that waste sites present. In addition to these areas, the improvement of modeling capabilities for complex media, complex/oily wastes, terrestrial food chain risks, and other processes is necessary for better evaluations of corrective action needs.

RECOMMENDATIONS:

- Develop guidance for application of modeling to corrective actions at specific sites.

TABLE 12

Models Are Not Available or Applied for Some Media and Pollutants

RCRA Program	Media				
	<u>Air</u>	<u>Soil</u>	<u>Ground Water</u>	<u>Surface Water</u>	<u>Terrestrial</u>
Characteristics	?	X	X	?	N/A
Listing/Delisting	?	X	X	?	N/A
Corrective Action	X	X	X	X	?
Subtitle C Siting and Permitting	X	X	X	X	?

RCRA Program	Pollutant/Waste Type					
	<u>Metals</u>	<u>Organic Wastes</u>	<u>Complex Wastes</u>	<u>Oily Wastes</u>	<u>Mixed Wastes</u>	<u>Infectious Agents</u>
Characteristics	X	X	?	?	?	?
Listing/Delisting	?	X	?	?	?	?
Corrective Action	X	X	?	X	X	?
Subtitle C Siting and Permitting	X	X	X	X	?	?

In the above table, "X" represents areas where capability now exists at some level, "N/A" indicates that the area is not applicable, and "?" indicates that the capability is generally not available or applied. Mixed wastes represent mixtures of hazardous and radioactive wastes, whereas complex wastes represent mixtures of hazardous wastes.

- Select a limited number of models suitable for application to site-specific analyses, and develop case studies, tutorials, training sessions, and technical guidance on how to best use them.
- Expand the Characteristics and Listing/Delisting modeling efforts to include multimedia pollution and subsequent exposures, including air, surface water, and food chain pathways.
- Develop and implement an education/technology transfer and technical assistance program module designed to foster the consistent and appropriate use of models in the RCRA program.
- Develop both specific decision-tree approaches to site characterization and management schemes to help identify data needs, model selection, and site evaluation and planning. In addition, identify criteria for consideration in the selection of appropriate models and successful use of these models.

Site-Specific Data Can Enhance Generic Modeling

FINDING: Incorporating site-specific data in generic models will improve their reliability and accuracy, and field validation will demonstrate their ability to correctly simulate real-world conditions.

DISCUSSION: Generic models are being developed for using health risk as the basis for classifying wastes as hazardous or nonhazardous. Generic models represent a reasonable approximation of whether levels of protection that a national regulation is designed to achieve will be realized. They do not indicate whether those levels will be realized at a particular site.

A nationwide data collection effort for determining ranges and distributions of input parameters is needed. Also needed is the collection of data on site-specific heterogeneity, since a weakness in the approach is that individual sites simulated are treated uniformly.

RECOMMENDATIONS:

- Identify, measure, and statistically characterize the environmental and chemical properties of a wide range of Subtitle D facilities.

- Develop and make available exposure assessment models that include important fate and transport mechanisms operating in the soil, vadose, and saturated zones.

Pollution Prevention and Risk Reduction Technologies

Technology development plays an important role in the implementation of RCRA in three areas:

- pollution prevention;
- the technical standards for owners and operators of hazardous waste treatment, storage, and disposal facilities; and
- corrective action at these facilities.

These specific areas are technology driven. Advances in pollution prevention depend on the development of new products, processes, and materials. The land ban regulations are based on the "best demonstrated available technology" (BDAT). Corrective action for ground water at RCRA facilities can only be implemented using pump-and-treat technologies of uncertain effectiveness. Control of the contamination source (soils, wastes) can be implemented through various technologies; however, information on the economics and long-term performance of these technologies is limited. It is clear that technology improvements are needed. The technologies being developed for cleaning up Superfund sites in many cases will be applicable to RCRA corrective action situations. Thus, a close coordination of the two programs is essential.

EPA Has an Important Role in Fostering Pollution Prevention

FINDING: As a leader in pollution prevention, EPA has a crucial role to play in forging partnerships with private and public organizations, stimulating private-sector development and implementation of technologies, and disseminating information.

DISCUSSION: Pollution prevention offers great opportunities to extend the life of our current RCRA facilities and reduce the associated environmental risks. The term "pollution prevention" means reducing the volume and/or toxicity of pollution at the source of its generation. It is a broad concept that includes product changes, manufacturing

changes, and recycling and reusing materials. Pollution prevention technology is industry-specific. ORD is currently carrying out studies to determine the state of pollution prevention technologies in a variety of industries and is evaluating many innovative approaches to achieving pollution prevention.

Realizing the full potential of the benefits of pollution prevention will take a concerted effort by both the private and the public sectors. In most cases the private sector is in a better position to address pollution prevention research and development than EPA. While many other organizations recognize the benefits of pollution prevention, their lack of information, knowledge, and resources has often been a barrier to implementing pollution prevention programs. EPA has recently completed the *Pollution Prevention Research Plan: Report to Congress*, which presents a comprehensive pollution prevention research program.

RECOMMENDATIONS:

- Implement the *Pollution Prevention Research Plan*, emphasizing the following areas: low- and non-waste production technologies, environmentally benign products, techniques that lead to more recycling and reuse, socioeconomic implications of pollution prevention, the effects on pollution generation of new technologies now under development.
- Disseminate the information from this research to the private sector and various consumer-oriented users and municipalities.

Long-Term Effectiveness of Containment Systems Needs to Be Determined

FINDING: EPA has specified criteria for the design, construction, and operation of land disposal facilities, but does not have adequate information concerning the long-term performance of systems for containing hazardous wastes.

DISCUSSION: The major concern regarding containment systems is their long-term performance and reliability. Agency guidance and regulations recommend specific containment system designs based on best engineering judgment. This judgment, in turn, is based on short-term evaluations of system components made of soil and/or geosynthetic materials.

Long-term performance monitoring has not been conducted at sites where the EPA-recommended liner systems and covers have been constructed. Subsystems have only been constructed within the past half dozen years and are only now being closed. Improvements are also needed in the technology for measuring performance. The drain systems in present designs can provide a warning that seepage (leakage) is occurring but cannot identify the location or measure exact rates. Devices such as large pan lysimeters must be improved and tested and then incorporated in the designs for cover and liner systems so it will be possible to monitor performance.

RECOMMENDATION: Improve and test technology and designs for measuring performance, and then conduct evaluations at land disposal facilities that meet the current RCRA regulations. Evaluations would include cover and liner leakage, materials integrity, structural endurance, and characterizing releases (e.g., subsidence monitoring and subsidence effects on covers).

More Information on Incinerator Performance Is Needed

FINDING: More information on the performance of incinerators is needed to develop reliable surrogates for monitoring organic emissions of products of incomplete combustion and to improve technologies for treating contaminated soils.

DISCUSSION: Incineration (or more generally, thermal destruction) has been designated as the BDAT for many hazardous wastes and is commonly used for Superfund waste. The character of metal and PIC emissions and how they can be controlled are not fully understood.

Development of reliable surrogates that correlate to organic PIC emissions could greatly reduce compliance costs, improve our ability to implement the RCRA program, and foster public confidence. Continued efforts are needed to evaluate the partitioning of metals and the character of incinerator residuals (ash and scrubber water) as a function of operating conditions and waste characteristics. Additional performance evaluations of the ability of newer air pollution control devices to control metal emissions are required.

The use of high-temperature incineration to treat contaminated soil is expensive; may increase the mobility of metals remaining in the ash; and

may increase the emission of metals from the combustion chamber. Promising innovative approaches are: (1) the use of additives (lime, silica, etc.) to improve the efficiency of air pollution control devices to collect metals, and/or to reduce the mobility of the metals in the ash, and (2) low-temperature thermal desorption in the primary chamber.

RECOMMENDATIONS:

- Develop more information on incinerator performance with respect to PIC and metal emissions to satisfy EPA's regulatory requirements.
- Investigate the use of additives and low-temperature desorption.

Ground-Water Treatment Technologies Need Improvement

FINDING: "Pump and treat" is the most prevalent method used to clean up aquifers. Results to date, however, do not indicate whether this method can achieve ground-water standards without additional actions to control the contaminant source.

DISCUSSION: Cleaning up chemicals from the subsurface, in both the solid and the aqueous phases, is a difficult task. Remediation systems (pump and treat) implemented years ago are approaching their expected maturity dates with discouraging results. Careful study of the contaminants and the transport processes in the subsurface indicates that many of the contaminants exhibit low aqueous solubility and are strongly partitioned (sorbed) onto soil and aquifer matrices. For this reason, corrective action by passing water through contaminated zones (pump and treat) will take much longer than originally estimated. Additional actions to deal with the contaminant source must be coupled with improvements in pumping strategies to ensure that aquifer and soil materials do not continue to re-contaminate ground water for long periods.

RECOMMENDATION: Conduct further research on source control technologies and on the gaseous, solid, and immersed phases of contaminants in aquifers in order to understand how corrective actions involving pumping systems can be better designed and operated to meet cleanup standards.

Cleanup Technologies Need Improvement

FINDING: There is a need to research, develop, and demonstrate improved, cost-effective remediation technologies and to minimize barriers to their application.

DISCUSSION: Besides incineration, few proven technologies are available for destroying organics. Incineration may not be suitable for large volumes of material with low concentrations of contaminants, high moisture content, and low BTU. Some chemical and biological innovative treatment methods are under development; a base-catalyzed decomposition process appears very promising for halogenated and some other organics where moisture content is low to moderate. Biological methods are applicable to a number of wastes over a wide range of concentrations. Another approach is to extract and concentrate the pollutants from the solids matrix, and then detoxify the residual by conventional chemical, thermal, or biological processes. Many advances have been made in the field, and a few commercial systems are available; however, many technical problems remain. Other extraction processes for organics, such as soil washing and critical fluid extraction, are being evaluated.

Soils, sludge, and sediments contaminated with heavy metals present different problems. Since metals cannot be destroyed, they must be converted to a form that is not toxic, does not migrate, or is easily removed through conventional treatment systems. Extraction of low concentrations of metals from soils requires very aggressive extraction chemicals (very strong acids or bases) and has not been shown to be effective. Thus, most approaches to controlling heavy metals have been to convert the metal to a less toxic and/or less mobile form. Some successes have been demonstrated using this approach (i.e., solidification/stabilization), but the long-term stability of the material has been questioned.

Finally, no single system has emerged where the material is contaminated with both organics and heavy metals. A "treatment train" may provide the solution. First, the organics must be removed or treated, followed by the stabilization of the heavy metals. One exception to this rule may be biological systems, where heavy metals toxic to the organisms must be removed before the organics can be treated.

RECOMMENDATIONS:

- Determine RCRA priority areas for research, development, and demonstration of cleanup technologies.
- Assess whether Superfund technologies meet RCRA needs. If not, consider the need for a separate effort to address any unmet RCRA needs.

Development, Demonstration, and Use of Innovative Treatment Technologies

The three major phases of evolution for a technology are development, demonstration/evaluation, and full-scale application. EPA regulations, policies, and guidance have a major impact on a developer's prospects at each of these critical points.

RD&D Permits Do Not Effectively Promote Innovation

FINDING: The Research, Development, and Demonstration (RD&D) permit mechanism has not generally been a streamlined mechanism for fostering technology development.

DISCUSSION: Development of innovative hazardous waste treatment technologies is relatively unique in the extent to which *the innovation process* itself may be subject to regulation. To date, EPA and state agencies have not been focused on developing a hospitable regulatory environment for innovation. The Hazardous and Solid Waste Amendments (HSWA) envisioned a streamlined version of the formal, full-scale permitting process for small, minimal-impact technology development projects. Due in part to concerns regarding abuses of experimental-use permits in other programs, the RD&D permit guidance took a narrow rather than an expansive view.

Despite headquarters guidance that RD&D permits are a national priority, EPA's management systems contain no measure by which the regions may receive credit for such activities. Regions commonly estimate 12-18 months for RD&D permit processing. The actual time is often less than the 12-18 month estimate, but is considerably longer than many vendors find desirable. At least one report

cites application costs and paperwork requirements that rival the full "Part B" application. Smaller vendors with capital and cash-flow limitations find the process frustrating.

There is a significant challenge for each region to maintain the expertise to deal with infrequent requests for permits for technologies that may not be well understood. The situation is further complicated by the low rate of state adoption of RD&D permitting. A potential source of some relief is that a number of RD&D permits have been issued to testing and evaluation (T&E) facilities, which plan to market their services to vendors of innovative technologies. EPA's Office of Research and Development is developing such a facility (E-TEC) in Edison, New Jersey.

RECOMMENDATIONS:

- Encourage the establishment and use of T&E facilities to reduce the permit workload for regions and vendors.
- Consider centralizing the process of evaluating and even issuing RD&D permits.
- Consider giving credit in management systems for issuance of RD&D permits.

State Adoption of "Innovation Relief" Mechanisms Has Been Limited

FINDING: A 1988 survey of three EPA regional offices covering 20 states found that adoption of the Subpart X, RD&D permitting, 1,000 kg treatability exclusion, and permit modification provisions was virtually nil.

DISCUSSION: The 1,000 kg rule is intended to facilitate laboratory and pilot-scale testing of limited quantities of hazardous waste by exempting them from permitting. It has the potential to take additional pressure off of RD&D permitting.

Similarly the permit modification rule may save time and effort for facilities that already have permits. However, a number of regions report that for *full-scale* treatment, this will still be a resource-intensive "major modification" of the permit.

RECOMMENDATION: Strongly encourage state adoption of these relief mechanisms, particularly in states with active programs and significant contamination problems.

Permitting Requirements Hamper Mobile Treatment Units

FINDING: Permitting requirements are an impediment to the development and use of innovative mobile treatment units (MTUs).

DISCUSSION: An MTU rule was proposed in 1987 following a petition by the Hazardous Waste Treatment Council (HWTC). Currently, mobile/transportable units must undergo full RCRA permitting at each location, regardless of the quantity of material to be processed or the duration of the operation.

In principle, the proposed MTU rule was designed to capture some of the attributes of the Toxic Substances Control Act program, which issues nationwide permits for technologies that treat polychlorinated biphenyls. The proposed rule suggested that MTUs be issued statewide permits for generic components, with site-specific additions as necessary.

The current EPA position is that such a permit would trigger a requirement for corrective action at an entire facility, and that altering that situation requires a legislative amendment. One of the objectives of the Keystone dialogue group is to develop statutory language for consideration in RCRA reauthorization, under the rubric of "accelerated corrective action."

RECOMMENDATIONS: EPA has devoted considerable attention to facilitating permitting of units intended to be applied at multiple sites. Continued investment is clearly warranted. For truly low-risk technologies, it may even be possible to develop permit-by-rule provisions.

Subpart X Rule Needs Supplemental Guidance

FINDING: While conferring flexibility, the generic nature of the Subpart X rule also poses problems for permit writers unfamiliar with innovative technologies.

DISCUSSION: This rule establishes generic standards for permitting miscellaneous treatment units. Before its promulgation, innovative technologies were caught in a permitting dilemma: their use required a RCRA Part B permit, but a Part B permit could not be issued because there were no permitting standards.

The Subpart X rule contains general rather than technology-specific standards. The rule allows, but does not enable or assist permit writers in writing, permits for the wide range of treatment technologies.

RECOMMENDATION: Develop additional guidance to supplement Subpart X regarding the permitting of innovative technologies. This would increase the confidence of permit writers, and would help vendors understand what is expected of them.

Effects of BDAT/Land Disposal Restrictions on Innovation Are Unclear

FINDING: It is not clear at this point whether BDAT will have a positive or negative effect on innovation, in large part because BDAT regulations for soil and debris are still under development, and because BDAT regulations provide for technology waivers in appropriate situations.

DISCUSSION: The prospect of choosing expensive cleanup technologies (e.g., high-temperature incineration) due to the stringent treatment and disposal requirements of the land ban regulations for RCRA wastes has been cited as a factor in no action or capping decisions at Superfund sites. Even if an innovative technology vendor is capable of meeting BDAT, treated material must still be disposed of in a hazardous waste management facility, unless it is delisted. Delisting is perceived as a slow, cumbersome, uncertain process.

An important test of the effect of BDAT standards for soil and debris will come with the evaluation of bioremediation alternatives. While this technology offers considerable promise, it may not be able to meet the precise standards for organics destruction based on incineration technologies.

RECOMMENDATION: Ensure that in developing environmentally protective BDAT standards for soil and debris, we are sensitive to the need to foster affordable, effective innovative cleanup technologies.

Corrective Action Can Stimulate Development of Innovative Technologies

FINDING: RCRA corrective action may create a significant demand for innovative technologies to address serious contamination situations. Despite regulatory uncertainties, there is potential for a large market.

DISCUSSION: Corrective action activity is, for the most part, in the early site investigation (i.e., RCRA Facility Assessment and RCRA Facility Investigation) stages. The regions have had limited experience evaluating, selecting, and applying treatment remedies.

The Corrective Action Outyear Strategy (CAOS) estimates that 60%-70% of the estimated 5,700 facilities (with some 81,000 solid waste management units) will require some form of corrective action. If only 10%-15% of those units require source control, the corrective action remedial workload will rival that of Superfund.

In response to Superfund requirements, a hazardous waste treatment industry oriented toward site remediation has developed. This industry, focused on mobile/transportable technologies, supplements the fixed facilities that grew up to serve the existing hazardous waste treatment and disposal market. The industry generally consists of small- to medium-size companies. These firms often have limited capital and cash reserves and limited staff to deal with regulatory issues.

Many contamination problems at solid waste management units will be similar to those encountered at Superfund sites. For sites with single contaminants in relatively easy-to-address media, there will be opportunities to develop innovative cost-effective cleanup methods. We have limited experience treating mixtures of organics and inorganics and/or complex soil matrices. Innovation at these sites is wide open, and in many cases is essential if treatment is to occur. Considerable development work remains, particularly where treatment "trains" are needed and for bioremediation, which offers the potential for substantial cost savings in in-situ applications.

Unlike SARA, HSWA is silent on issues of level of treatment and permanence. This creates uncertainty regarding the extent to which source control will be required. Despite the uncertainty, there is potential for a large market. Economically viable owner/operators with property that has redevelopment/resale value will be exploring "cost-effective" remedies. Prospective buyers are increasingly aware of the dangers of buying contaminated property.

Permitting and other regulatory requirements (e.g., BDAT) may pose significant problems in terms of resources and time delays. Among the questions are what regulatory requirements will apply to

interim measures, to treatability studies, and to full-scale corrective action. A large influx of corrective action treatment proposals would swamp the regions with issues of timing, efficacy of technology, and cleanup standards. Enforcement orders issued under RCRA 7003(h) have been construed to not require permits. Unfortunately, owner/operators are very reluctant to sign orders that require a finding of "imminent and substantial" danger.

As discussed above, state failure to adopt the "innovation relief mechanisms" developed by EPA is a significant problem. This is exacerbated by the possible requirement to obtain air and/or water permits in addition to hazardous waste requirements.

RECOMMENDATIONS:

- Draw upon Superfund treatment experience to the maximum extent practicable in implementing the corrective action program.
- Technical information dissemination, technology-related training, and technology transfer are needed to allow innovative solutions at severely contaminated sites. A combined RCRA/Superfund treatability and treatment data base, perhaps housed in the current Alternative Treatment Technology Information Clearinghouse (ATTIC) and accessible via computer to regional and state staff, should be a priority action.
- Evaluate the utility of a RCRA analog of the Superfund "on-site policy," such as that contained in section 121(e) of SARA regarding the requirement to obtain federal and state permits.

State Involvement in Innovative Technology Development and Demonstration Is Increasing

FINDING: Some state governments are becoming more active in establishing programs that foster the development and demonstration of innovative technologies.

DISCUSSION: Innovative technology development has been a growing interest of states over the last five years. Several states have established Offices of Science and Technology at the highest levels of state government. Some have backed up their policy commitment to technology development

and innovation with grant programs to stimulate such activity. During this study, the work group learned that California, Illinois, New York, and New Jersey have programs aimed at the development of technologies for treating hazardous waste.

RECOMMENDATIONS:

- EPA should seek to harness and nurture state leadership in promoting innovative technology.

State assumption of RD&D, permit modification, and 1000 kg treatability exemption authorities would empower a small but growing number of states to take leadership positions.

- Where states are exercising such leadership and developing information, EPA should disseminate that information and facilitate networking among those states.

APPENDIX A

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3001(a)	Hazardous waste characteristic and listing determination criteria	4/28/78	5/19/80	
3001(b)(1)	Hazardous waste characteristic and listing regulations	4/28/78	5/19/80	
3001(b)(2)(B)	Oil and gas waste regulatory determination	6 months after RTC †	7/06/88 (Note 1)	
3001(b)(3)(C)	Utility waste regulatory determination	6 months after RTC	No reg. determin. (Note 2)	
3001(b)(3)(C)	Decision to regulate mining waste	6 months after RTC	7/03/86 (extraction and beneficiation)	
3001(b)(3)(C)	Mineral processing wastes regulatory determination	6 months after RTC		(Note 3)
3001(b)(3)(C)	Cement kiln dust waste regulatory determination	6 months after RTC		4/96
3001(d)	Small quantity generator (SQG) standards	3/31/86 HAMMER	3/24/86	
HSWA §221(c)	SQG mgmt. practices study	4/1/85	2/28/85	
HSWA §221(d)	Uniform manifest and SQGs study	4/1/87	10/86	
HSWA §221(e)	Licensing transporters of SQG wastes study	4/1/87	11/86	
HSWA §221(f)	SQG wastes from educational institutions study	4/1/87	10/88	

† Report to Congress

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3001(e)(1)	Listing-chlorinated dioxins/dibenzofurans	5/08/85	1/14/85	
3001(e)(1)	Listing-halogenated dioxins/dibenzofurans	11/08/85		
	Dioxin-containing wood preserving waste	11/08/85	12/30/88 (proposal)	11/90
3001(e)(2)	Listing-chlorinated aliphatics	2/08/86	12/11/89	
3001(e)(2)	Listing-dioxin	2/08/86	1/14/85 (Note 4)	1/97 (proposed)
3001(e)(2)	Listing-dimethyl hydrazine ("UDMH")	2/08/86	5/2/90 final & add'l proposal	9/93
3001(e)(2)	Listing-toluene diisocyanate (TDI)	2/08/86	10/23/85	
3001(e)(2)	Listing-carbamates	2/08/86	10/24/86	7/93 add'l proposal
3001(e)(2)	Listing-bromocil	2/08/86	5/1/85 proposal	9/92 final
3001(e)(2)	Listing-linuron	2/08/86	5/1/85 proposal	9/92 final
3001(e)(2)	Listing-organo-bromines: EDB Methyl bromide Add'l organo-bromines	2/08/86	2/13/86 10/06/89	1/97 proposal
3001(e)(2)	Listing-solvents	2/08/86	2/25/86	4/91 add'l proposal
3001(e)(2)	Listing-refining wastes	2/08/86	11/20/80 proposal 2/11/85 4/13/88 notice of data availability	9/90 final
3001(e)(2)	Listing-chlorinated aromatics	2/08/86		4/91 proposal

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3001(e)(2)	Listing-dyes and pigments	2/08/86		6/91 proposal
3001(e)(2)	Listing-inorganic chemical industry waste	2/08/86		7/97 proposal
3001(e)(2)	Listing-lithium batteries	2/08/86	3/07/84 (Note 5)	
3001(e)(2)	Listing-coke byproducts	2/08/86		8/90 proposal
3001(e)(2)	Listing-paint production wastes	2/08/86		12/91 proposal
3001(e)(2)	Listing-coal slurry pipeline effluent	2/08/86		12/95 proposal
3001(f)	Temporary delisting grant expiration	11/08/86 HAMMER	11/08/86	
3001(g)	Revisions to EP toxicity characteristic (test only)	3/08/87	11/07/86	
3001(h)	Additional characteristics- TC	11/08/86	3/29/90	
3002(a)	Hazardous waste generator standards	4/28/78	2/26/80	
3003(a)	Hazardous waste transporter standards	4/28/78	2/26/80	
3003(c)	Hazardous waste fuel transporter stds	11/08/86	11/29/85	
3004(a)	Hazardous waste treatment, storage, and disposal facility stds	4/28/78	5/19/80	
3004(c)	Containerized liquids-landfill standards	2/08/86	12/24/86 proposal	6/94 final
3004(d) & (m)	Land disposal determinations-California wastes	7/08/87 HAMMER	7/08/87	

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3004(e) & (m)	Land disposal determinations- solvents and dioxins	11/08/86 HAMMER	11/07/86	
3004(f) & (m)	Deep well injection prohibition determinations	8/08/88 HAMMER	7/26/88	
3004(g)(1)	Land disposal determinations schedule	11/08/86	5/28/86	
3004(g)(4)(A) & (m)	Land disposal determinations- first third	8/08/88 HAMMER	8/17/88	
3004(g)(4)(B) & (m)	Land disposal determinations- second third	6/09/89 HAMMER	6/23/89	
3004(g)(4)(C) & (m)	Land disposal determinations- final third	5/08/90 HAMMER	6/1/90	
3004 (g) (4)	Land disposal determinations - newly listed wastes	6 months after listing	6/23/89 6/01/90	3/92
3004(n)	Hazardous waste treatment, storage, and disposal facility air emissions regulations	6/08/87	6/21/90 (Phase I)	1990 Phase II proposal
3004(o)(4)(A)	Leak detection systems proposal	5/08/87	5/29/87	9/92 final
3004(o)(5)(A)	Minimum technology requirements regulations or guidance	11/08/86	3/28/86 proposal 4/17/87 notice of guidance	
3004(o)(7)	Vulnerable hydrogeology guidance criteria	5/08/86	8/07/86 notice of guidance	
3004 (o)(7)	Location Standards			11/90 proposal

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3004(q)	Burning & blending admin controls for generators transporters and burners	11/08/85	11/29/85	
3004(q)	Burning & blending- tech burning (emissions) stds	11/08/86	5/06/87 proposal	3/91 final
3004(s)	Burning and blending- notification requirement	2/08/86	11/29/85	
3004(u)	Corrective action at permitted facilities standards (SWMUs)	None	7/15/85	
3004(v)	Corrective action beyond facility boundary standards	None	12/01/87	
3004(w)	Underground hazardous waste tank standards	3/01/85	7/14/86	
3005(a)	Hazardous waste treatment, storage, and disposal facility permit requirements	4/28/78	5/19/80	
3005(c)(2)(A)(i)	Issue final permits-land disposal facilities	11/08/88	92% operating facilities permitted by 11/08/88	
3005(c)(2)(A)(ii)	Issue final permits-incinerators	11/08/89	90% permitted by 11/08/89	
3005(c)(2)(B)	Issue final permits-other facilities	11/08/92	30% completed	
3005(j)(5)	Variance - surface impoundment retrofit	11/87 (Note 6)	14 variances granted by statutory deadline	
3005(j)(7)(A)	Minimum technology requirements exclusion study individual determinations	None (Note 7)		

Status of EPA's Action on Subtitle C Statutory Requirements

<u>RCRA Section</u>	<u>Description</u>	<u>Statutory Deadline</u>	<u>Federal Register Publication Date *</u>	<u>Next Milestone**</u>
3006(a)	State hazardous waste program guidelines	4/28/78	5/19/80	
3007(e)(1)	Mandatory inspection program/regulations	11/08/85 (program only)	10/91 proposal	
3007(e)(2)	Use of private inspectors study	5/08/85	3/91 draft report	
3014(b)	Proposed listing of used oil	11/08/85	11/29/85	
3014(b)	Final listing of used oil	11/08/86	11/19/86 (Note 8)	8/90 notice of data availability
3014(c)(2)(A)	Recycled used oil management standards	11/08/86	11/29/85 proposal	4/91 re-proposal
3017(b)	Hazardous waste export regulations	11/08/85	8/08/86	
3018(a)	Domestic sewage exclusion report	2/08/86	2/86	
3018(b)	Domestic sewage regulations	8/08/87	11/23/88 proposal	7/90 (Note 9)
3018(c)	Wastewater lagoons report	11/08/87	11/87	
8002(r)	Waste minimization report to Congress	10/01/86	10/15/86	

* Final action, unless otherwise indicated
 ** Dates reflect current commitments and informed judgments of future resources and priorities

1. RTC on oil and gas waste submitted 12/87.
2. RTC on combustion of coal at utility power plants was submitted on 3/8/88.
3. RTC is due by July 31, 1990.
4. Final listing for dioxin-containing wastes F020, F021, F022, F023, F026, F027, F028.

5. EPA clarified that lithium batteries are hazardous waste because they meet the reactivity characteristic.
6. Administrator must make determination on retrofit variances submitted by 11/86.
7. Administrator "shall" study and report to Congress; but no deadline given.
8. Determination made to not list recycled oils; overturned by Court 10/88.
9. Final regulations to be issued along with CWA pretreatment program revisions.

APPENDIX B

Case Study of Federal-State Relations

Introduction

On February 21 and 22, 1990, three people from state A were interviewed, representing the areas of enforcement, permitting, and state authorization. In addition, eight regional office staff were interviewed (one individually, seven as a group), representing current and past state officials.

The consensus among all regional and state staff was that the relationship between the region and the state had been seriously troubled, but that they had been able to substantially overcome those problems over a period of years. This required a concerted effort by the state and the region to resolve the problems, as well as a change in philosophy by the state and the region about how the RCRA program is to be implemented.

Program Background

Before the RCRA regulations were promulgated in 1980, state A already had an active hazardous waste program. During the early years of the RCRA program, the state's relationship with the EPA regional office was likened to that of contractor and client, with EPA "contracting" with the state to conduct inspections of facilities and EPA playing the role of the enforcer. The relationship was depicted by the interviewees as fairly good during this period. The only criticism of the relationship was that state staff often believed they were being second-guessed by EPA.

In 1983, the state made significant changes to its hazardous waste program to encompass the RCRA requirements and to close what it believed were loopholes in RCRA. In implementing this interim-authorized program, the state chose to operate essentially two programs: the state program that focused on state priorities (funded by state funds above the required match) and the RCRA program that addressed federal regulatory requirements (funded by the EPA grant and the state match). EPA, however, considered the state's entire hazardous waste program (regardless of what was funded by the grant) to be the authorized program. This fundamental difference over the role of the grant was perhaps the major problem between EPA and the state.

The state currently has final authorization for the base RCRA program, non-HSWA Cluster I, and mixed waste. The state is working on additional modifications to its program.

Description of Past Relationship

All interviewees agreed that the past regional-state relationship was poor. A number of problems contributed to the breakdown in the relationship. A primary cause was the difference in philosophy over the role of the grant. The state had its own legislative and regulatory requirements that needed to be met, and believed that its state-specific hazardous waste requirements could be carried out separately from the federal RCRA program. Given the resource constraints that existed, the state was not able to address EPA's priorities to the extent that the region believed appropriate. Furthermore, the state did not believe EPA should have a role in setting priorities for the "state-only" program. The region, consistent with national policy, wanted to look at the larger hazardous waste program and thought it should have a role in setting overall state priorities.

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Compounding this problem was the fact that the state and federal planning cycles are not the same. The state's fiscal year runs from July to June, and the federal fiscal year from October to September. The state would identify its priorities for the year, only to have EPA, whose planning cycle begins months later, give the state additional RCRA requirements to complete by the end of the federal fiscal year. The state and the region each perceived the other as being rigid and inflexible in its views.

Oversight was another part of the grant process that caused conflicts, in terms of the scope of the region's oversight activities and its approach to it. Again, the region took a much broader view of the scope of its oversight authority, not limiting it strictly to that portion of the program funded by the grant and the state's match. In addition, the region and the state took a different approach to oversight meetings (audits). One EPA interviewee observed that EPA came to the meetings with facilities identified, prepared to hear how the state intended to fix the problems. The state, on the other hand, came prepared to discuss whether there were problems at facilities and, if so, how to address them. Each had a different concept of the purpose of oversight. The state also believed it was being criticized in areas in which it either had received no guidance or had not received the most recent guidance. One state interviewee thought that EPA's expectations were unrealistic and ambiguous.

The perceived rigidity was also reflected when dealing with programmatic issues. The region and the state were unable to resolve differences on several matters of regulatory interpretation or national policy. For example, there was a major disagreement over how to classify treatment, storage, and disposal facilities. The state tended to call a generator with drums a generator that had exceeded the storage limit, while the region classified it as an illegal storage facility. The state also disagreed with the region on whether spills should cause a handler to be classified as a land disposal facility. In the enforcement area, the state resisted identifying Class I (the most serious) violations because EPA would hold the state to the "timely and appropriate" enforcement criteria. The state differed from EPA in its approach to enforcement by trying to differentiate in treatment or procedures between large facilities with ample resources and small facilities with few resources. The region, however, was more tied to the timely and appropriate criteria, thus appearing to be inflexible to the state. This resulted in several EPA overfiles when the state took enforcement actions that EPA thought to be inappropriate.

Authorization exacerbated an already strained relationship. The region, again reflecting national policy, judged the state strictly by the statutory requirements of consistency, equivalency, and adequate enforcement. However, the region and the state had different expectations. While the state was not carrying out the program the region envisioned, it believed it was carrying out a hazardous waste program that was an improvement over RCRA. The state was required to change at least one aspect of its program that it strongly believed was better than RCRA. When EPA determined, however, that the state was not meeting the statutory requirements, final authorization was delayed for a year. The state received final authorization on January 31, 1986.

In addition to the inability to understand and be flexible about each other's needs and priorities, the interviewees all agreed that the structure of the RCRA program begged for conflicts. There were numerous problems inherent with the new RCRA program that caused tensions between state and regional personnel. The new RCRA requirements were very complex and difficult to understand. The program was new to both the region and the state, and each was trying to determine its respective role. It was thought that the detailed nature of the regulations and the expectations of Congress and EPA would put stress on any relationship, especially an already weak one.

Problem Resolution

The interviewees agreed that the EPA-state relationship hit its lowest point by 1987. Both the state and the region realized the relationship was severely strained. Top state and EPA management organized a RCRA program managers' retreat to try to deal with the program's problems and conflicts. One state interviewee pointed out that it was at this meeting that state staff realize for the first time that an authorized state program meant the state's entire hazardous waste program, not simply that portion funded by the federal grant. This realization, coupled with limited resources, loss of a number of state inspectors, and poor federal-state relations, caused the state to form a committee to determine whether to retain the authorized hazardous waste program.

At the same time, EPA proposed to withdraw the RCRA program due to its belief that the state's permitting and enforcement programs were inadequate and that the state's philosophy on hazardous waste management would prevent it from ever running a program that would be acceptable to EPA. EPA's Administrator did not approve this recommendation, so the state and EPA developed a formal agreement providing for a period of time during which the state would run a state priority program, while EPA implemented the RCRA program. For the next year, EPA's regional office ran the RCRA program, withholding grant money from the state to do so. The state retained its authorization, with EPA performing the technical permit review and taking enforcement actions as necessary. The state issued the EPA-developed permits, usually with minimal involvement.

After a year of running the state priority program, the state decided to retain its RCRA authorization, recognizing that it would mean accepting EPA's view of the scope of the authorized hazardous waste program. Pressure from industry and environmental groups were factors in this decision. They both preferred a state-run program over a federal program. The state made a major concession by acknowledging that the hazardous waste program was a comprehensive program driven by both state and Federal laws. EPA also recognized that some concessions were necessary and appropriate, and agreed to be selective in making decisions about the state's plans and priorities. The region agreed to look at the relative priorities of the entire program (apart from RCRA priorities). If EPA agreed that state priorities were more important, the state could pursue them and the region would defend the state's priorities to EPA headquarters, if necessary. Once the state started showing EPA the whole picture, the region gained a better understanding of the state's priorities and resource constraints and was much more supportive of the state's initiatives.

Some time during 1987, the state began to think that the regional staff members were making an effort to improve their relationship with the state and to understand the state's needs. The state interviewees indicated that when they saw the region beginning to cooperate and compromise, the state was then willing to meet the region half way. Similarly, the region indicated that once it saw the state begin to cooperate, it felt more comfortable making compromises. A change in attitudes, new personnel who had not experienced the more rancorous EPA-state relationship, and a growing familiarity with RCRA all seemed to contribute to an improved relationship. Informal, weekly lunch meetings were hosted by EPA's Operations Office to enable EPA and state staff to get to know each other and to work out problems in an informal, neutral setting. Joint projects were set up to work out problems together. For example, in the summer of 1988, a team looked at both state and regional inspection reports to determine if the state inspections were of the same quality as the regional inspections and whether they fulfilled RCRA requirements. The team concluded that both parties obtained the same information, but used different formats. The state, however, is now developing a standard format in order to improve consistency among its field offices in reporting inspection results.

The state and the region made concerted efforts to address the specific problems that had caused friction between the region and the state. Quarterly compliance oversight meetings were suspended, since no one was satisfied with them. Instead, compliance issues are now dealt with on a case-by-case basis. The state and EPA formally agreed on when and how to handle spills under RCRA: if residuals cannot be cleaned up, the handler will be placed in the RCRA treatment, storage, and disposal facilities (TSDFs) universe. Otherwise, the state will handle the cleanup under other state authorities. The state adopted the Enforcement Response Policy and a penalty policy, resulting in more consistency and formality in enforcement actions and a ten-fold increase in the number of actions. EPA agreed, in return, not to hold the state strictly accountable for timely actions if violations were correctly classified and appropriate enforcement actions taken.

In the past, the state had found it difficult to maintain a contact at the region to discuss inspection problems. The state acknowledged that this was due to the high turnover rates of inspectors. To open and maintain the lines of communication, EPA assigned an inspector from its Operations Office to be available as support to the state. This inspector does independent inspections, joint inspections, and oversight inspections. One of the state interviewees stated that such a good relationship between the EPA inspector and the state has been built over the last two years, that the interviewee would send a new, inexperienced inspector along with the EPA inspector, and would trust the EPA inspector to help the state inspector by giving him or her constructive criticism. In the past, the state would not have trusted EPA enough to agree to this arrangement.

Current Status

All the interviewees agreed that the working relationship between the state and the EPA region has drastically improved. The state thinks that the region understands and is willing to be flexible about state priorities. The state and the region have a process by which they can agree to joint priorities. The interviewers also admitted that the state has become more flexible as well. Both parties seemed to trust each other more and are more willing to work together to meet program goals. Two state interviewees also pointed out that increased state funding was also important in relieving some of the pressure on the state hazardous waste program. New organizational units have been created to handle spills, municipal solid waste, and other toxics. This allows the hazardous waste program more flexibility to address EPA and state hazardous waste priorities.

The region and the state have developed the concept of partnership through sharing the workload. Both believe this is a more productive use of resources than the typical state-EPA mode of EPA giving out work, the state performing it, the region frequently duplicating the work through its oversight activities, and EPA telling the state what it is doing wrong. The region believes that work can be divided based on capability, resources, and priorities. While this is not a substitute for oversight, there is much less frequent review of the state's technical judgments. For example, the state may not have the resources to conduct all of the TSDF inspections EPA wants conducted because the state is devoting some resources to high-priority generator inspections. The region may agree to conduct some of the federal facility inspections in lieu of having the state do these. EPA and the state believe that this concept will minimize overlap and conflict between EPA and the state and maximize resource utilization. These trade-offs have been made both informally and through the formal RIP-flex process.

Although all interviewees agreed that the current relationship with the EPA region was good, a few areas still need improvement. One of the areas discussed was exchange of information. The state interviewees thought that the region has ready access to state information, but the state often finds it difficult to get information from the region. For example, the state has not been able to obtain early information on what activities EPA is conducting in the state (e.g., RFAs). In addition, the state still finds it difficult to get regulatory interpretations in a timely manner.

The adequacy of technical assistance and training was discussed by all interviewees. One state interviewee thought that training was made easily available to the state. Another state interviewee, however, thought that it was not offered often enough, especially the basics and inspector training. The state interviewees agreed that training was too oriented toward the regulatory requirements, with insufficient emphasis on implementation.

Recommendations

The state interviewees made a number of recommendations for improving federal-state relationships. To improve the authorization process, one interviewee mentioned both the ASTSWMO proposal and the Keystone report, favoring ASTSWMO's automatic authorization approach. The interviewee suggested that since the authorization process is so complex and cumbersome, an automatic authorization approach would save both time and resources. The interviewee also was in favor of partial authorization.

All interviewees suggested that EPA should improve its method for providing regulatory interpretations. It was suggested that more training should be provided, and that requests for regulatory interpretations should be answered in a more timely fashion. The state interviewees thought that this could be accomplished by EPA headquarters, delegating more authority to the regions and supporting the regions more in making interpretations and taking risks. This would allow for quicker responses to state-specific requests.

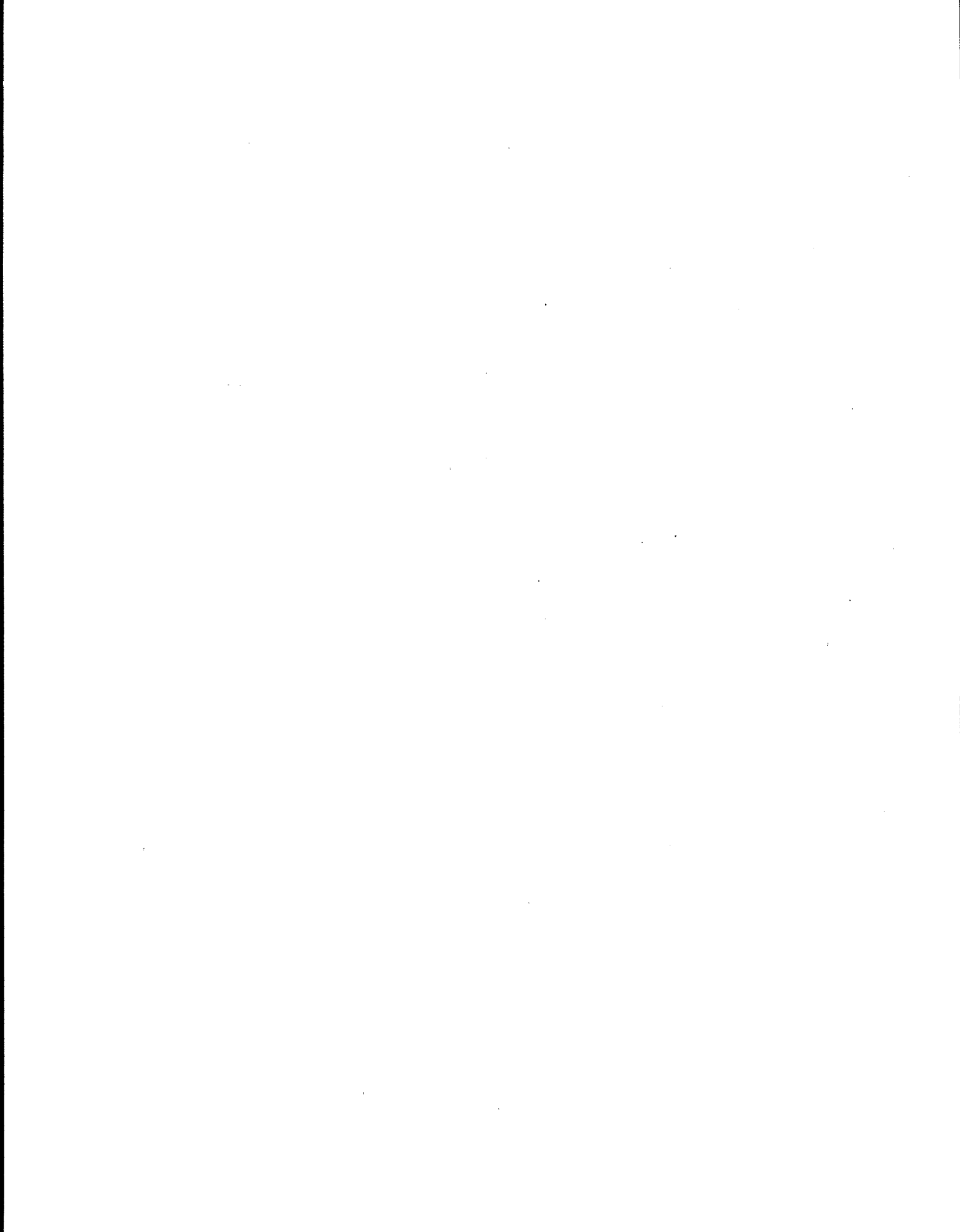
Another suggestion to improve the federal-state relationship was to initiate more joint projects to allow state and regional staff to work closely together toward a common goal. The use of focused evaluations was one method suggested. For example, a team of regional, state, and headquarters staff could evaluate permits. This method would result in a positive focus, instead of a negative one, providing a shared evaluation experience for those involved and a more balanced assessment to those being evaluated.

To address the problem of state staff turnover, one state interviewee suggested that EPA develop innovative ways to recognize the accomplishments of state staff. A reward or incentive program was recommended. One such program suggested by both the state and the region was a management training program for experienced staff, which EPA would offer and subsidize. A global perspective on hazardous waste management would be given to these top state people.

The state, in general, was not very concerned with EPA headquarters, other than to say that it should not be involved with the state's activities, except in a technical assistance capacity. The region, however, made several specific recommendations:

- headquarters needs to establish real priorities, linked to resources, and recognize that not everything can get done;
- headquarters should approach Congress, rather than being reactive, and explain the needs of the program and the way headquarters thinks RCRA should be structured;
- headquarters should focus more on policy and implementation issues because there is a disconnect between the regulations and implementation; and
- headquarters should pursue partial authorization and easier state program withdrawal.

One regional interviewee stated that headquarters must maintain the integrity of the program nationally. Where headquarters sometimes fails is with the style in which it carries out this responsibility. Headquarters is often perceived as being rigid, inflexible, and condescending. The region's ability to develop a cordial, cooperative relationship is impossible if headquarters is totally inflexible and allows only one outcome—its way.



APPENDIX C

Evaluation of the Implementation of RCRA Subtitle C Questions From the Permitting Subcommittee, February 13, 1990

Thank you for agreeing to be interviewed for EPA's study of the implementation of RCRA Subtitle C. This study is being conducted at the request of Don R. Clay, EPA's Assistant Administrator for Solid Waste and Emergency Response; its general purpose is to determine what's working well in the Subtitle C program and what isn't. The Permitting Subcommittee is specifically interested in having the benefit of your experience and your observations about the quality and timeliness of Subtitle C permits, the permitting process, permitting priorities, and the use of permitting to promote waste minimization. Where you believe there are problems, we want to hear your suggestions for solving them. We are providing this list of questions to give you an opportunity to think about our questions before we actually interview you. You are not expected to provide answers in writing.

Quality

1. What do you think we should be getting from permitting in terms of environmental or other benefits?
 - a. Are we getting these benefits?
 - b. Are there other ways to get the same or more benefits?
2. What do you think are the elements of a "quality" RCRA permit?
 - Conformance to regulations
 - Conformance to guidance
 - Tailored to site/facility
 - Consistency among Regions and States
 - Provisions are enforceable
 - Fact sheets are complete
 - Understandability
 - Other
3. How are we doing on permit quality so far?
 - a. Have you observed problems with the quality of some permits?
 - b. Have you observed things that we are doing well?
4. In your experience, what factors have had the greatest impact on the quality of permits?
 - Availability, timeliness, and quality of, and training on use of guidance (technical and policy)
 - Turnover among permit writers
 - Adequacy of resources at RO/State level
 - Knowledge and training of permit writers
 - Federal/State coordination
 - Content of permit applications (quality)
 - Content of permit applications (quantity of information - not enough, or too much)
 - Cooperativeness of applicant
 - Involvement of enforcement staff in developing permit
 - EPA oversight of State base permits

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- Adequacy of legal and technical review
 - Complexity of regulations
 - Statutory deadlines and grant commitments
 - Participation by public
5. What can we do to improve the quality of permits?
- a. Are there things we can do within the existing process?
 - b. Are there regulatory changes that could be made without changing the statute?
 - c. Are there changes that could be accomplished only through statutory revisions?

Permit Process and Timeliness

6. Of the basic steps in the permit process, which are working well and which are problem areas? Why?
- Application
 - Administrative/Technical review
 - Draft permit
 - Public Participation
 - Final Determination
 - Appeal
7. What are the principal factors affecting the timeliness of the permitting process?
- Statutory deadlines
 - Joint Federal/State process
 - Timeliness of permit application
 - Quality of permit applications
 - Review within Regional Office/State
 - Number and quality of Notices of Deficiency
 - Adequacy of owner/operator response to Notices of Deficiency
 - Public involvement
 - Complexity of regulations
 - Availability of training
 - Availability of guidance/policy/regulations
 - Staff turnover
 - Adequacy of resources
 - Development of corrective action provisions
 - Permit appeals
 - State permit fees
 - Other
8. What suggestions do you have to improve the permitting process?
- a. To make it more timely?
 - b. To protect the environment more effectively?
 - c. To use resources more efficiently?

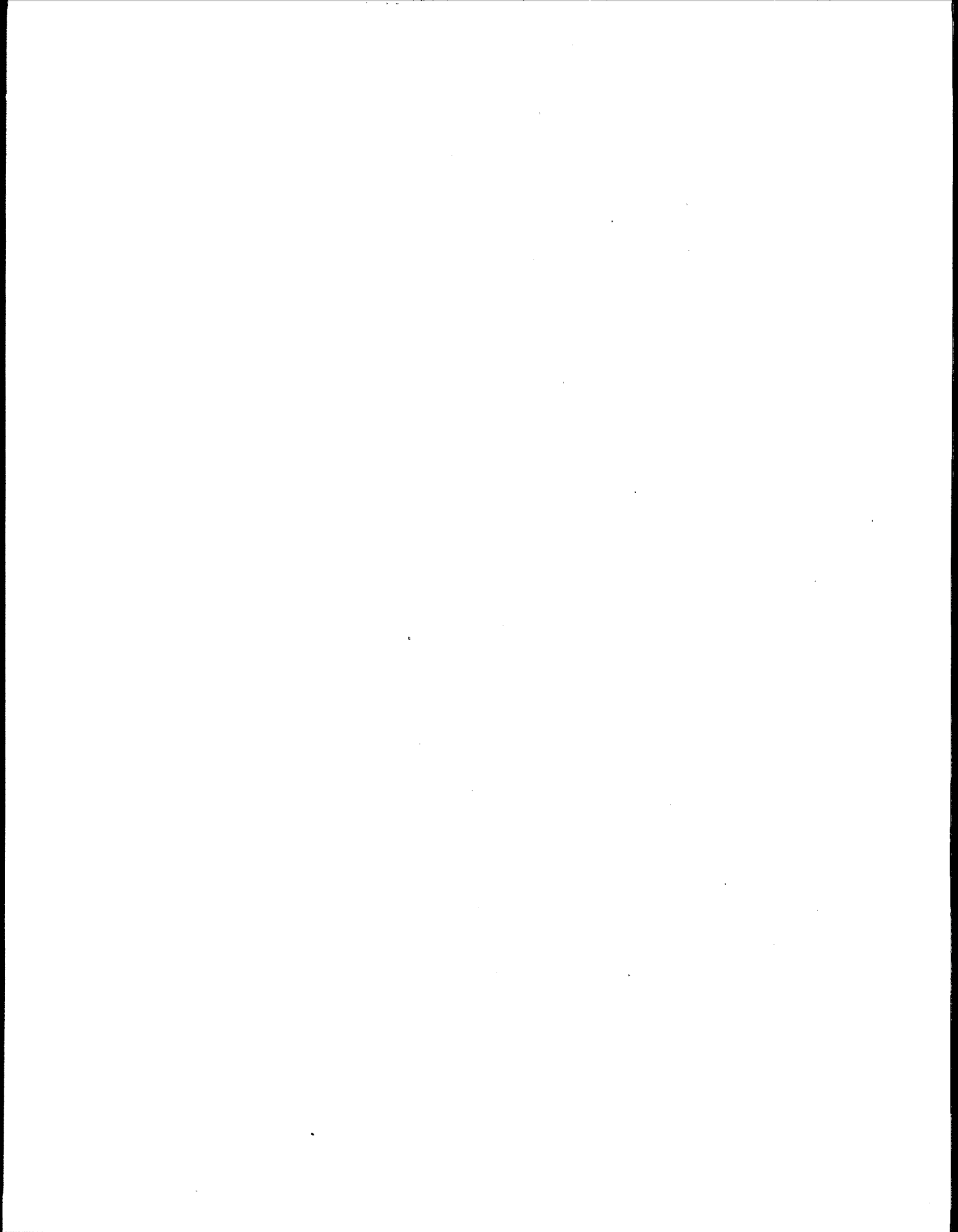
9. Are there any permitting approaches used by other regulatory programs that should be considered in the RCRA Permitting Program?
 - Scheduling "rounds" of permitting, adding new requirements in the next "round" (NPDES)
 - "General" or "class" permits for certain types of facilities (NPDES)
 - More flexibility for mobile treatment units (TSCA)
 - Limit corrective action to priority facilities (Superfund)
10. How well is the permit modification process working, and how can it be improved?
 - Are too many modifications required?
 - Did the new modification regulations improve the permitting process?
11. Do you have any suggestions for handling 5-year reviews?
12. How well is joint (State RCRA/EPA HSWA) permitting working and how can it be improved?

Priorities

13. For the following pairs of activities, which one do you think provides the greatest environmental benefit?
 - a. Issuance of storage and treatment permits vs. issuance of post-closure permits
 - b. Permitting of interim status facilities vs. maintenance of existing permits (e.g., modifications, review of reports submitted by permittee)
 - c. Issuance of permits to existing vs. new facilities
 - d. Preventive (i.e., operating) vs. corrective action portion of the program
 - e. USEPA Regional Office oversight to State activities vs. direct implementation of program
14. How have shifting priorities affected your permitting activities?
15. What criteria should we be using to set priorities for permitting?
 - a. Can and should they be set solely on the basis of environmental significance?

Waste Minimization

16. Are permittees submitting waste minimization plans that are meaningful?
17. Do you think permitting could be effective in promoting waste minimization?
18. Are there alternative approaches to promoting waste minimization that should be pursued more aggressively?



APPENDIX D

Post-Closure Permitting Strategy

Strategy Is One Element of Overall Strategy

EPA currently estimates that the post-closure universe includes 1,690 facilities. Of those:

- 93 have received post-closure permits.
- 255 facilities have "clean closed." EPA estimates that the majority of these will require additional work to determine whether post-closure permits are necessary.
- 1,342 are closed or will close.

In addition to issuing post-closure permits to 1,600 potential facilities, EPA and the states have approximately 850 storage and treatment permits to issue. Furthermore, corrective action requirements will be necessary at most of these storage and treatment and post-closure facilities. Given this enormous task, EPA must address the post-closure workload in conjunction with the storage and treatment and corrective action workloads. Thus, this post-closure permitting strategy is actually one element of an overall permitting and corrective action strategy.

There are two key elements of this permitting strategy:

- Prioritizing facilities; and
- Selecting appropriate mechanisms for addressing facilities.

Recommendations for prioritization and selection of appropriate mechanisms are set out below, with suggested timeframes.

Continue Intensive Permitting Effort

EPA and the states should immediately prioritize facilities as follows:

- Reduce emphasis on storage, and treatment to most environmentally significant facilities. These facilities would include those with the most immediate corrective action needs and those providing new or expanded treatment capacity.
- Increase emphasis on environmentally significant post-closure facilities, including those with the most immediate corrective action needs.

In addition, the agencies should identify facilities whose need for corrective action could be addressed through enforcement orders or agreements. These facilities would then be directed to enforcement rather than permitting personnel.

Develop Prioritization Management System

Within 3 to 6 months, EPA should develop a management system to address post-closure permits, storage and treatment permits, and corrective action. The system should be based on environmental significance.

The need for corrective action is one element of environmental significance, and the system should incorporate the Environmental Priorities Initiative. This management system should also include factors such as waste volume and toxicity, toxic release inventory data, location of the facility, and the facility's past performance.

Allow for "Decoupling" of Corrective Action and Permits

Within 3 months, EPA should decide under what circumstances the base operating or post-closure permit and the corrective action portion could be "decoupled." Action to initiate a statutory change would follow the Agency's decision.

Identify Alternative Mechanisms to Permitting

Within 3 months, EPA should decide to allow the use of alternative mechanisms for permitting. For post-closure permits, alternatives would include enforcement or a hybrid permitting/enforcement action. Class permits for certain storage facilities would be another alternative. Action to initiate the appropriate regulatory or statutory changes would follow the Agency's decision.

Implement New System

Within 6 months, EPA should implement the new prioritization management system and alternative mechanisms identified above.

APPENDIX E

Public Participation Can Affect the Permit Process

CWM Chemical Services, Inc. Chicago Incinerator Chicago, Illinois

CWM Chemical Services, Inc. Chicago Incinerator (formerly SCA) is one of the nation's three permitted commercial PCB incinerators, which also burns a variety of hazardous waste. The CWM facility is located on the south side of Chicago in an area of concentrated industrial activity, with a high population density. Southeast Chicago, in general, is one of the areas with the worst air quality in Illinois in terms of airborne particulate matter.

The RCRA/HSWA permit for the CWM Chicago Incinerator was originally proposed on May 22, 1987. A public hearing was held on July 9, 1987. Substantial comments were received from Illinois and U.S. Congressmen and a number of environmental and community groups. The majority of the comments received have expressed opposition to the issuance of a permit to the facility. The public believes that the CWM incinerator emissions are causing an increased incidence of cancer and other health problems in the area. In addition, the public is very concerned about the environmental record of this facility, and the numerous violations alleged against CWM.

Public and Congressional interest in the site resulted in the formation of the Illinois General Assembly Joint Committee to investigate the hazardous waste situation in southeast Chicago. At the request of this Committee, the Illinois Environmental Protection Agency (IEPA) delayed the issuance of its portion of the RCRA/HSWA permit. U.S. EPA agreed to do the same. The Joint Committee report was due to the General Assembly on October 31, 1987, one month after the originally scheduled permit issuance date.

The IEPA and U.S. EPA received the Committee report for review in December, 1987. The report supported the issuance of the RCRA/HSWA joint permit to CWM. However, permit issuance was delayed again in early 1988 when CWM announced that the stack monitor for carbon monoxide had been disconnected on four occasions in November 1986. As a result of these violations, the issuance of the permit was delayed for over a year while enforcement actions were taken.

The U.S. EPA opened a new public comment period on June 15, 1989, to accept comments on changes in the HSWA portion of the permit. Again, public interest was significant. On September 29, 1989, the RCRA portion of the permit was denied by the IEPA, due to the Company's failure to correct certain technical deficiencies in its Part B permit application. As a result of the State's decision, the U.S. EPA did not issue the HSWA portion of the permit. The Company appealed the State's decision on November 2, 1989. Currently, the CWM Chicago Incinerator is operating under interim status while the appeal is resolved.

Cecos International, Inc. Williamsburg, Ohio

CECOS is a commercial land disposal, treatment, and storage facility that operated under the interim-status requirements. Of the 1,214 acres of land that CECOS owns, 211 acres were being used for hazardous waste management, and 163 more acres were being proposed for future expansion of the waste management operations.

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On September 23, 1983, CECOS submitted a Part B permit application. Over the next 5 years, EPA issued three Notices of Deficiency and a Compliance Order to CECOS regarding deficiencies in the application. CECOS responded to these deficiencies by submitting new permit applications, which were subsequently determined to be incomplete. Despite the several meetings and conference calls that took place between EPA and CECOS to discuss the deficiencies, the facility failed to submit a complete application. As a result, on April 21, 1988, EPA issued a Notice of Intent to deny CECOS the permit.

The Citizens of Claremont County were extremely active in the permit process for the CECOS facility. Their major concern was the potential contamination of drinking-water sources. They used the Claremont County Board of Commissioners to voice their opposition. The Commissioners hired consultants and legal representation to present their position to EPA. Attendance at the public hearing exceeded 200 citizens, including county residents; company officials, employees, and customers; public interest groups; and local, state, and Congressional representatives. Individuals presented statements supporting both issuance and denial of the permit.

After considering the numerous oral and written comments submitted during the public participation process, on September 29, 1988, EPA issued its final determination to deny the permit. The denial was based primarily upon a large number of deficiencies remaining in the applications after EPA and Ohio EPA reviewed them. In addition, several deficiencies were identified by the Clermont County Board of Commissioners during its review undertaken at the request of the local citizenry.

On November 1, 1988, CECOS submitted a Petition for Review of the permit denial. On January 11, 1990, EPA's Administrator signed the order denying the CECOS petition for review. Then on February 14, 1990, CECOS sent the Administrator a Request for Reconsideration or a Stay Pending Judicial Review. A decision on this request is still pending.

APPENDIX F

RCRA Treatment, Storage and Disposal Facilities (TSDs) Have Received the Large Majority of Attention in the C&E Program

The consistent emphasis placed on TSDs has also resulted in a program where a similar understanding is much less clear for generators, non-notifiers, and illegal hazardous waste disposal. This finding was generally supported by the 46 interviews of representatives of the federal (EPA-15, DOJ-1 DOE-1), state (17), industry (8), and environmental (2) communities. Moreover, the priorities that have been set each year have consistently been comprehensive and have covered virtually all possible C&E activities. The requirement that "mandatory" inspections be conducted semi-annually, annually, and biennially for TSDs, regardless of their compliance history, has had the effect of committing a major share of available resources to this segment of the regulated community.

This is clearly illustrated by a review of the Agency Operating Guidance (AOG) from fiscal 1985 to fiscal 1991. During this period, the highest C&E inspection priority has consistently been to support enforcement against handlers or activities or releases that present the greatest threat to the public or the environment. This is universally appropriate but has not really driven resources. Just as consistently, the second priority has been the annual inspection of federal, state, and local TSDs to support the statutory requirement. The third priority has been, beginning in fiscal 1987, commercial TSDs to support the off-site policy. The fourth priority between fiscal 1987 and 1991 is other land disposal facilities (LDFs) (this was second and third in fiscal 1985 and 1986, respectively), consistent with EPA's priority to protect ground water and to meet permit deadlines and statutory requirements. The fifth to seventh priorities (from fiscal 1986 on) have been permitted incinerators and other TSDs to support permit deadlines and statutory requirements. The lowest priorities for mandatory inspections (sixth to ninth) have been large-quantity generators (and transporters), although the percent of the universe to be inspected annually increased from no minimum in fiscal 1985 to 2% in fiscal 1986 to 4% in fiscal 1987-88, and finally to 7% in fiscal 1989 to the present. All of the above C&E priorities were consistent with the RCRA national program priorities.

Following mandatory inspection priorities are the non-mandatory priorities. Foremost in this category (except fiscal 1991) has been support of criminal enforcement activity (seventh to fourteenth). However, because of the increasing types of mandatory inspections (exports, Toxicity Characteristics, boilers and furnaces, mixed waste) and non-mandatory inspections (Medical Waste Treatment Act, delisting), criminal support ranks below more activities than ever before in fiscal 1991. Following criminal support, non-notifier inspections have consistently ranked next from fiscal 1987 on. As with criminal support, it ranks behind more activities than ever in fiscal 1991. Burners, blenders, and waste oil inspections have been consistently at or near the bottom of all C&E inspection activities. However, the potential violation of greatest concern at these facilities is the illegal mixing of hazardous waste with used and virgin oil; this could fall under criminal support.

The above priorities (especially mandatory inspections) have been more or less consistent from fiscal 1985 to fiscal 1991. Emphasis has been on TSDs, especially LDFs. This has been consistent with the national RCRA priorities of protecting public health and the environment, issuing permits, protecting ground water, meeting statutory and EPA policy requirements, preventing future CERCLA sites, and ensuring the compliance of federal facilities.

Furthermore, a review of 31 annual state RCRA grant work plans and 21 EPA end-of-year program evaluations in a total of 12 states and regions during the period 1986-89 was conducted to determine whether the C&E program priorities were being reflected in annual work plans and effectively implemented. The

results show that the priorities in the mandatory inspection and enforcement categories of the AOG (i.e., those focusing primarily on LDFs and TSFs) received the highest priority in the field and were included in work plans and implemented at a 90% level.

On the other hand, non-mandatory inspection and enforcement activities (including criminal, non-notifier, and waste oil) received much less emphasis (30%-40%), although criminal efforts as a separate subcategory showed a higher level of activity (about 70%). The conclusion of this review of state activity is that due to the AOG's historical focus on LDFs and TSDs, and the recent emphasis on HSWA implementation, fewer resources were available for criminal, non-notifier, waste oil, and generator activities.

This consistent emphasis on TSDs has provided an assurance that cradle-to-grave hazardous waste management practices are generally being followed by TSDs. This is not to say that violations are not occurring, being detected, and being enforced against. In fact, the situation is quite the contrary; violations continue to be found in this important segment of the RCRA universe. On the other hand, due to an inability to conduct compliance monitoring at the majority of generators and for much of the non-notifier and criminal areas due to resource constraints, many violations are going undetected, much less being addressed in any manner. The absence of a strong and aggressive program to assess generator compliance on a much broader level than exists and to better detect criminal and non-notifier violations and to pursue enforcement may be failing to create the deterrent effect necessary to offset the economic incentive to violate. This is not only a conclusion based on a review of past priorities but a perception widely held by regulatory agency staff and others interviewed.

Two recent cases in EPA Region II illustrate this point. One case (administrative penalty and ongoing criminal investigation) involved a facility that notified EPA it was a generator but that had never been inspected. Based on information from an informer, an inspection found over 300 drums, illegally stored for up to 10 years, of hazardous waste (toxic solvents). Many of the drums were corroded, leaking, uncovered, and exposed to the elements, causing overtopping and spillage to bare earth and a nearby storm drain. A routine practice was intentional dumping of liquid hazardous waste onto the soil and to the storm drain. Air violations (no permit) were also found.

The second case involved a non-notifier that, in fact, operated as a generator and illegal storage facility. Over 150 drums of hazardous waste (F-solvents, D001) were stored so that incompatible wastes were mixed together without marking, labeling, or other protective requirements. Employees were at risk, since there had been no training in handling hazardous waste, no contingency or emergency preparedness plan, etc. During a recent major fire at the facility, firefighters had to operate at risk in the illegal storage area, probably causing spillage. A large penalty is being sought, and a criminal investigation is being conducted.

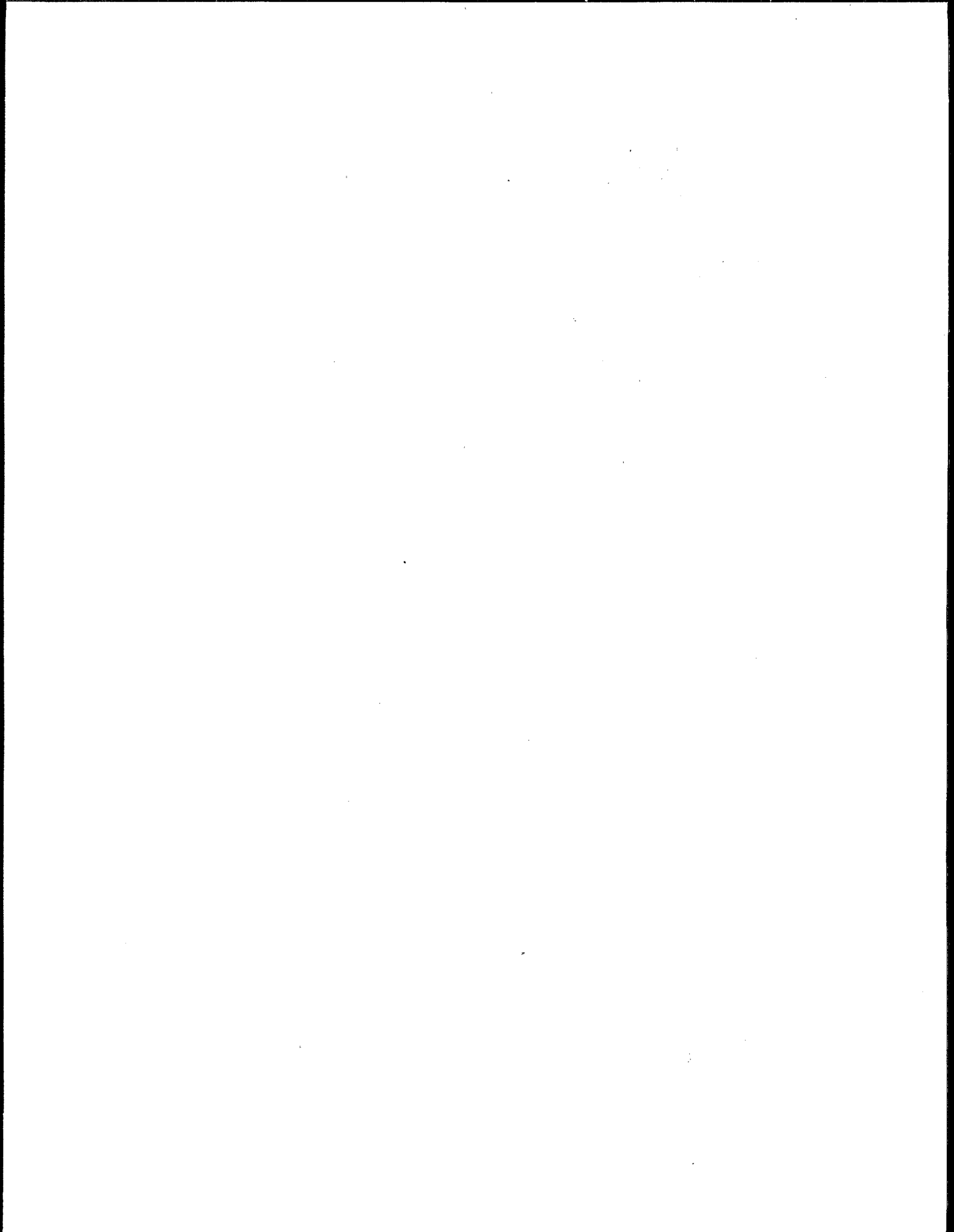
In order to improve the C&E program with respect to coverage of generators, non-notifiers, and criminal activity and at the same time maintain the deterrent program in place for TSDs, it is appropriate to consider that the criteria used to determine inspection frequency be related more to the potential for finding significant violations and less to an automatic reinspection on a set interval of every 6, 12, or 24 months. This conclusion is further supported by the increased workload due to the expanding RCRA universe over the next few years.

One option is to select TSDs with histories of satisfactory compliance with RCRA (one criterion could be three years without a formal action and where a determination has been made that there are no apparent reasons to expect a deterioration in compliance status) for an oversight program that requires less frequent on-site inspections. For example, inspect LDFs, including federal, state, and local facilities (FSLs) once every other year; TSFs, including FSLs, once every three years; and commercial facilities once a year. Requiring

submissions from TSDs, such as written certification (using a standardized checklist) that compliance is being maintained, is another option. Technical certification (e.g., ground-water monitoring, incinerator operation) could be by a registered professional engineer, whereas administrative certification could be by the facility's owner or operator. Likewise, reinspection of generators found to be in compliance could be optional until all other non-inspected generators received an inspection.

The resources made available from this targeted approach could be dedicated to areas of major environmental significance, such as generators, non-notifiers, and illegal hazardous waste disposal. Moreover, annual planning efforts, expressed through the AOG, could identify which specific generator, non-notifier, etc., initiatives (e.g., industrial SIC, geographic, quantities/toxicity of hazardous waste) would be major activities for the upcoming year based on environmental significance and previous C&E activity and presence.

It is important to recognize, however, that flexibility is needed region to region and state to state in establishing such initiatives based on the special characteristics and needs of different geographic areas. Moreover, EPA and the states must develop and agree on the essential components, roles, and activities comprising successful non-notifier and criminal programs before grant funding and implementation. Once implemented, EPA needs to carry out state oversight as well as direct C&E activity, just as it has with TSDs.



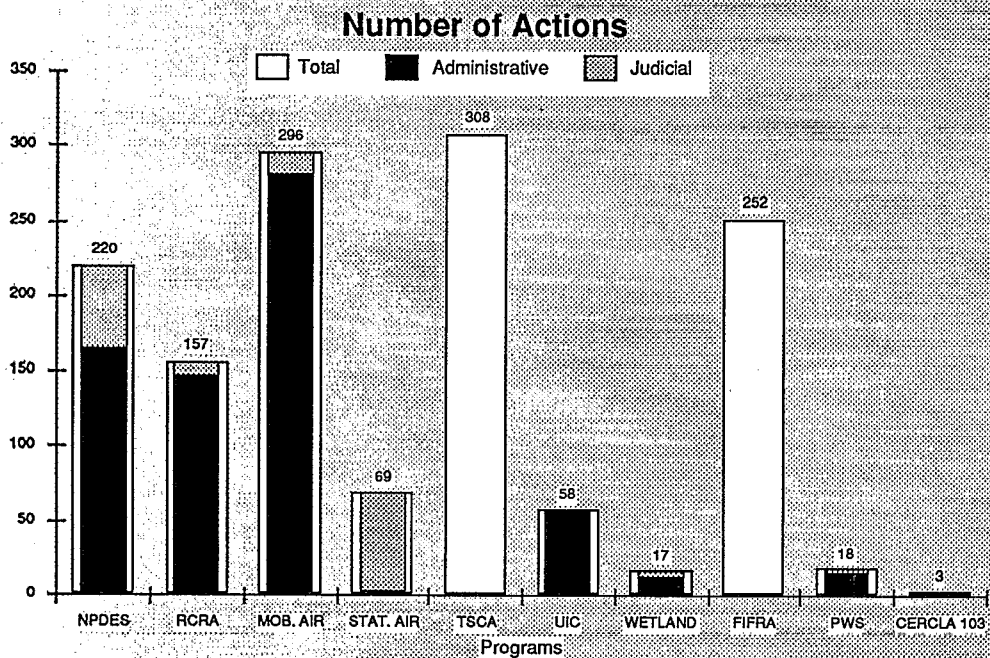
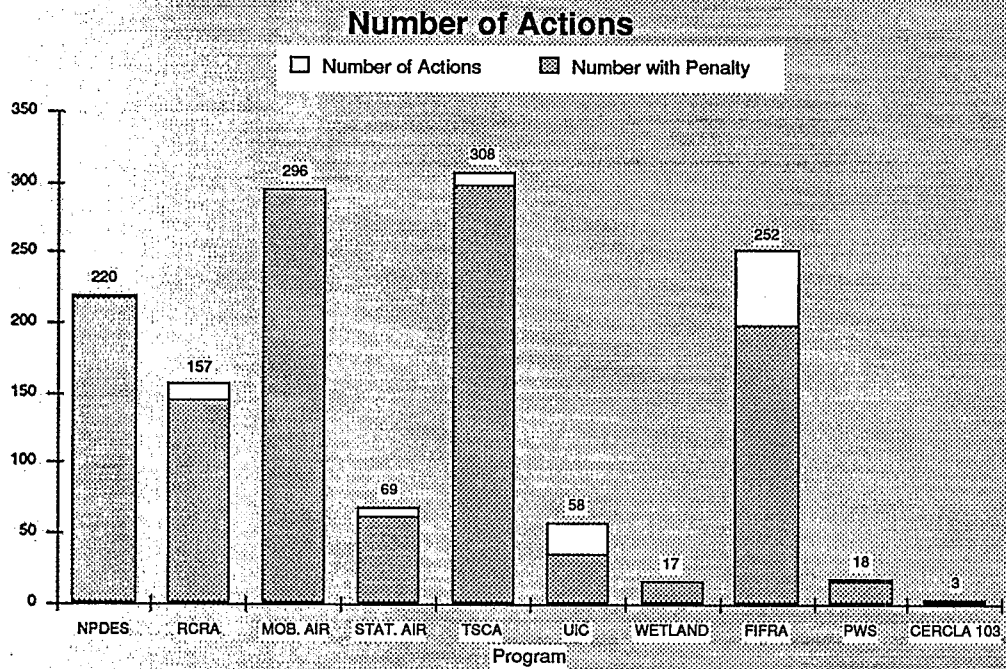
APPENDIX G

RCRA Compares Favorably with Other EPA Programs in Terms of Enforcement Activity

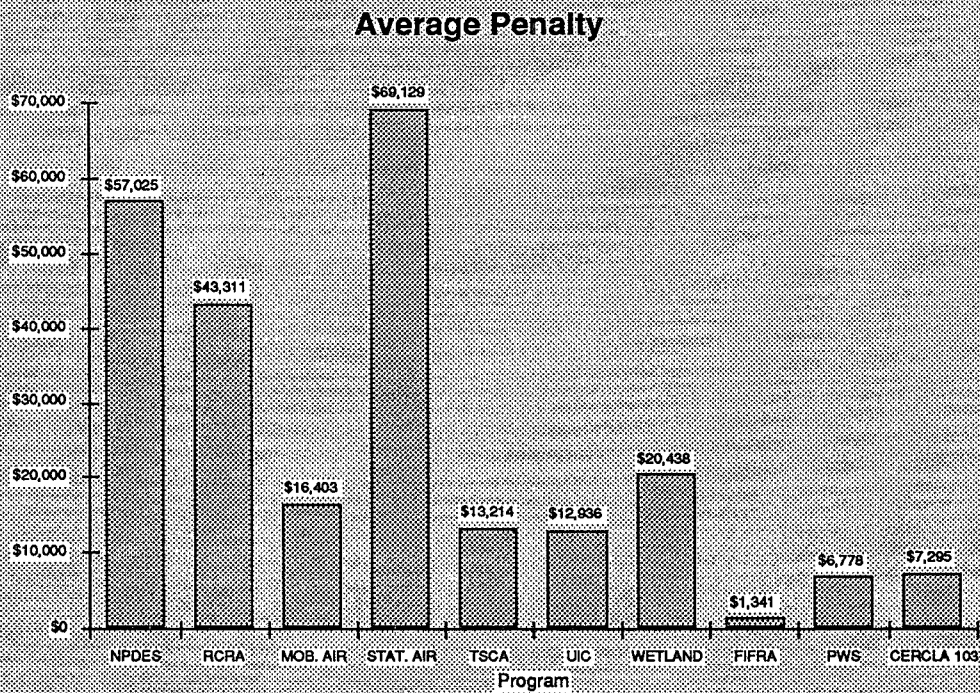
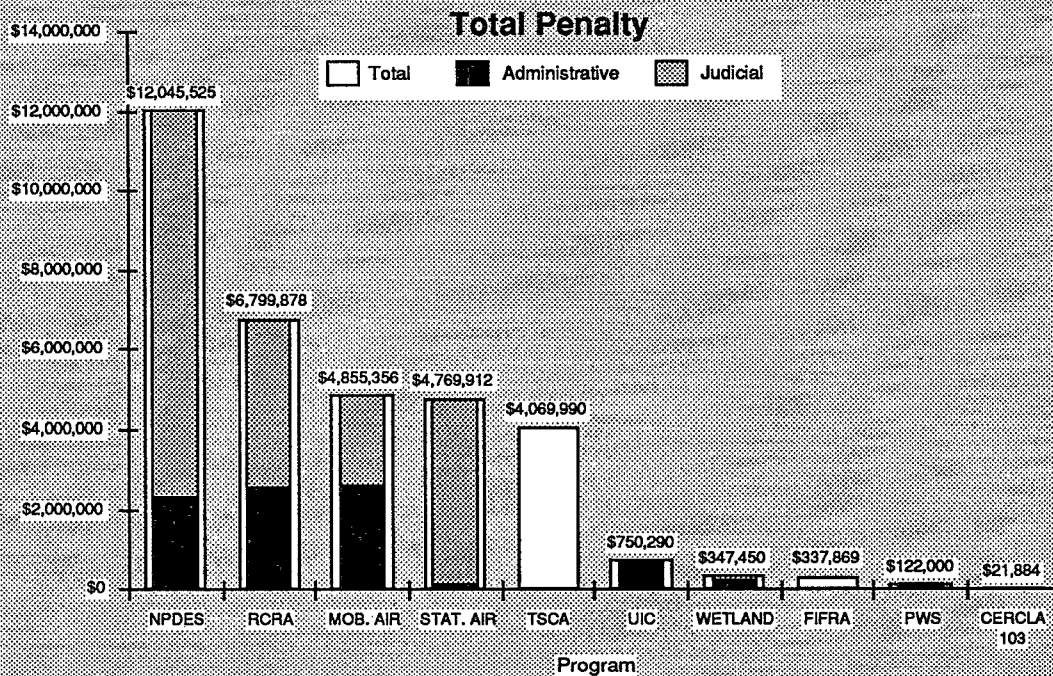
If success is measured through the imposition of formal actions and penalties, RCRA compares favorably with other programs. The figures in this appendix show fiscal 1989 data for EPA's major programs.

As can be seen, penalties in RCRA administrative cases compare favorably to similar data for the air and water programs. Also, RCRA stakes claim to the highest judicial penalty, and performs well compared to the air and water programs in terms of the average judicial penalty. But this impressive performance on the part of the RCRA judicial enforcement program is based largely on a single judicial action (U.S. v. Environmental Waste Control, which is currently on appeal), thus, EPA has not actually received this penalty. Particularly weaker areas compared to the air and water programs involve the number of judicial actions and the percentage of judicial actions containing a penalty. This may be in part due to the fact that RCRA has traditionally been enforced through administrative actions. Also the RCRA C&E program is considerably smaller than the air and water programs.

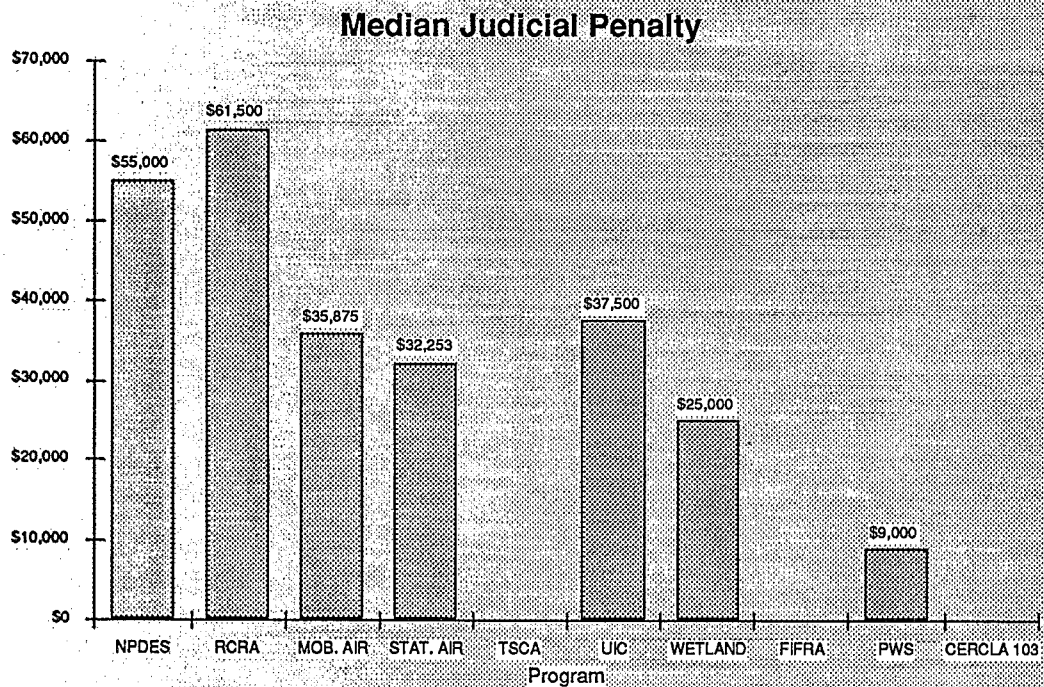
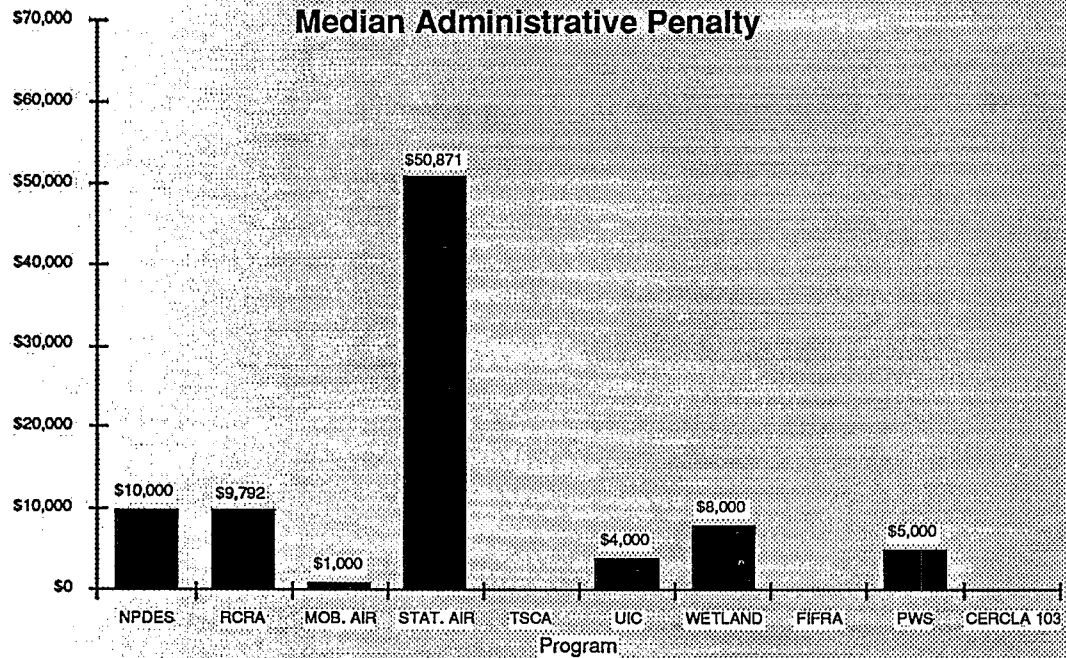
EPA Enforcement Actions and Penalties for Fiscal Year 1989



EPA Enforcement Actions and Penalties for Fiscal Year 1989



EPA Enforcement Actions and Penalties for Fiscal Year 1989



EPA Enforcement Actions and Penalties for Fiscal Year 1989

Program	Total Penalty	Number of Actions	Percent with Penalty	Median Penalty	Average Penalty	Highest Penalty
NPDES ADM	2,301,525	165	99%	10,000	16,979	100,000
NPDES JUD	9,744,000	55	99%	55,000	177,164	1,540,000
NPDES ADM&JUD	12,045,525	220	99%		57,025	1,540,000
UIC ADM	675,290	56	62%	4,000	12,059	125,000
UIC JUD	75,000	2	67%	37,500	37,500	55,000
UIC ADM&JUD	750,290	58	62%		12,936	125,000
PWS ADM	66,000	14	100%	5,000	4,714	5,000
PWS JUD	56,000	4	80%	9,000	14,000	37,500
PWS ADM	122,000	18	95%		6,778	37,500
WETLAND ADM	197,450	12	100%	8,000	16,454	75,000
WETLAND JUD	150,000	5	83%	25,000	30,000	50,000
WETLAND ADM&JUD	347,450	17	94%		20,438	75,000
STATIONARY AIR ADM	101,741	2	100%	50,871	50,871	100,000
STATIONARY AIR JUD	4,668,171	67	93%	32,253	69,674	600,000
STATIONARY AIR ADM&JUD	4,769,912	69	91%		69,129	600,000
MOBILE AIR ADM	2,542,940	280	100%	1,000	9,082	666,981
MODILE AIR JUD	2,312,416	16	100%	35,875	144,526	1,666,666
MODILE AIR ADM&JUD	4,855,356	296	100%		16,403	1,666,666
RCRA ADM	2,512,378	146	95%	9,792	17,208	137,751
RCRA JUD	4,287,500	11	73%	61,500	389,773	2,778,000
RCRA ADM&JUD	6,799,878	157	93%		43,311	2,778,000
CERCLA 103	21,884	3	75%	3,334	7,295	16,550
TSCA	4,069,990	308	97%	7,000	13,214	615,550
FIFRA	337,869	252	79%	1,014	1,341	10,000

