

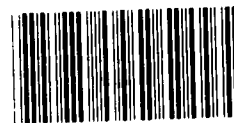
GAO

Report to the Chairman, Subcommittee on
Commerce, Transportation and Tourism,
Committee on Energy and Commerce,
House of Representatives

December 1986

HAZARDOUS WASTE

EPA Has Made Limited Progress in Determining the Wastes to Be Regulated

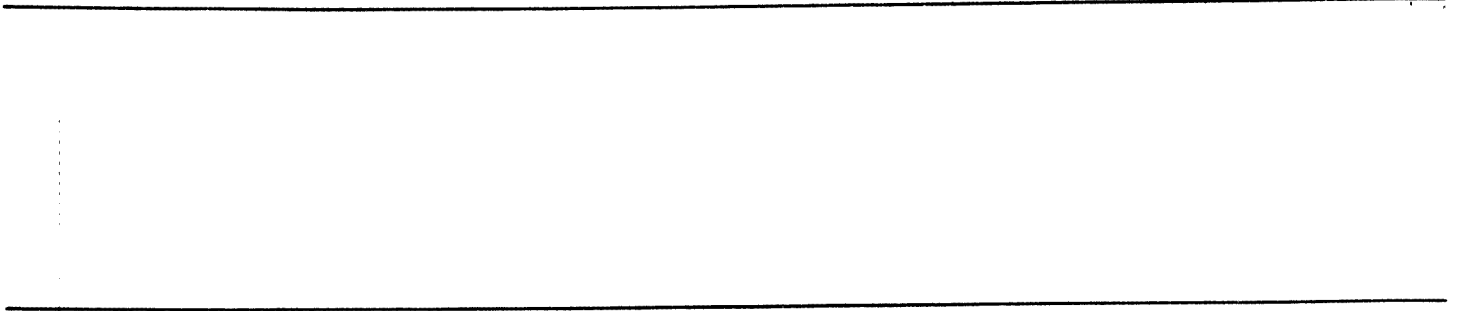


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Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-224640

December 23, 1986

The Honorable James J. Florio
Chairman, Subcommittee on Commerce,
Transportation and Tourism
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

This report is in response to your April 9, 1985, letter in which you requested that we review several issues primarily related to the Environmental Protection Agency's efforts to determine which wastes are hazardous and to produce a biennial report on the types and amounts of hazardous wastes generated, treated, stored, and disposed of in the United States.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to interested parties and make copies available to others upon request.

This work was performed under the direction of Hugh J. Wessinger, Senior Associate Director. Other major contributors are listed in appendix I.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Under the Resource Conservation and Recovery Act of 1976, the Congress charged the Environmental Protection Agency (EPA) with determining which wastes are hazardous and need to be regulated to protect human health and the environment. Until such wastes are identified and regulated, they could be released into the environment with potentially harmful effects.

Concerned about EPA's progress in determining which wastes are hazardous, the Chairman, Subcommittee on Commerce, Transportation and Tourism, House Committee on Energy and Commerce, requested that GAO review EPA's (1) approach and progress in identifying the hazardous wastes to be regulated, including progress in completing mandated studies on certain large-volume wastes, (2) actions to review EPA and state-authorized exclusions (delistings) for handlers petitioning to have their wastes excluded from regulation, and (3) efforts to produce a biennial report on the types and quantities of hazardous wastes generated, treated, stored, and disposed of nationwide.

Background

EPA has primarily used two approaches in determining which wastes are hazardous: (1) listing specific chemical products and industrial wastes that are hazardous and (2) establishing characteristics that a hazardous waste exhibits, such as ignitability. As early as 1976, the Congress required EPA to review the potential hazards of certain large-volume wastes, such as mining wastes, which were exempted from regulation until the studies were completed. In 1984 the Congress also required EPA to consider additional characteristics and to list as hazardous or decide whether to list 19 specific wastes.

Once EPA lists a hazardous waste from a particular industry, a handler may petition EPA to be delisted from regulation if the specific waste does not have the hazardous properties for which the waste was listed. Hazardous waste handlers must report biennially on their hazardous waste generation, treatment, storage, and disposal. States may be authorized by EPA to run the hazardous waste program, which includes such activities as enforcement and delisting, if their programs are at least equivalent to EPA's.

Results in Brief

Without a plan directing EPA's identification efforts, EPA has made only limited progress in identifying the hazardous wastes that need to be controlled. Progress has also been slow in completing the mandated large-volume waste studies.

Although EPA is applying new, more stringent review criteria to its own past delisting actions, it does not know what wastes the authorized states have delisted and does not plan to apply the new criteria to past state delistings. Despite a high error rate in handler delisting petitions, EPA has taken only limited action to verify the completeness and accuracy of the petitions.

EPA was not able to issue a biennial report on the amounts of hazardous waste generated and managed in 1983 because of incomplete and inaccurate data. Moreover, it may not have reliable information for the 1985 report.

EPA cites other priorities to explain its limited actions in these areas. However, it is implementing or considering efforts to improve its performance in many of the areas.

Principal Findings

Progress in Identifying Hazardous Waste

In 1980 EPA identified four characteristics of a hazardous waste and named about 450 generally agreed-upon materials or substances as hazardous wastes. In the last 6 years it has added five new wastes and no new characteristics. EPA has met some of the deadlines the Congress set for considering additional characteristics and reviewing 19 specific wastes, but more work needs to be done.

EPA's identification efforts have been hampered by changing approaches or strategies. From 1976 to 1980, EPA attempted to develop characteristics of a hazardous waste and required handlers to test their wastes for those characteristics. However, EPA experienced problems in developing simple tests for handlers to use. EPA then focused on listings, which require it to identify and list the individual wastes or industrial processes that are hazardous. EPA is finding this time-consuming and cumbersome. For example, EPA expects to take until 1990 to list the hazardous wastes from four industries it began studying in 1981, and other industries remain to be studied.

According to EPA, potentially large numbers of hazardous wastes remain to be identified. As a result, EPA is currently considering refocusing its approach to characteristics by completing tests for the existing characteristics and developing additional characteristics. It is also planning to

refine the already listed hazardous wastes by setting concentration levels at which the wastes become hazardous. These changes may have major impacts on EPA's future hazardous waste identification efforts. However, each approach has problems that EPA has not yet resolved. (See ch. 2.)

EPA has also made limited progress in completing five congressionally mandated studies of large-volume wastes (i.e., wastes from mining and ore processing, oil- and gas-drilling, coal and other fossil fuel combustion, cement kiln dust, and domestic sewage) to identify the need, if any, for hazardous waste controls. Two studies have been issued. One study was on time; the other missed the original statutory deadline by 6 years. In addition, more information is needed on both of them. The three remaining studies are currently 3 to 4 years late, and EPA does not expect to complete them for up to 2 years. However, it is taking actions to complete the work, including directing the studies under one office, assigning additional staff, and developing study plans. (See ch. 3.)

EPA cites lack of resources and competing priorities, among others, as reasons for its limited progress in identifying hazardous wastes and completing mandated studies. GAO believes, however, that a contributing factor is the lack of an overall management plan directing the efforts with specific milestones, resources, and responsibilities.

Delisting Program

In 1984, concerned that wastes delisted by EPA may still be hazardous, the Congress required EPA to use more stringent criteria when reviewing petitions to delist wastes and to apply the new criteria to the 150 temporary delistings EPA had granted. EPA applied the new criteria to its own temporary delistings, but not to an estimated 100 delistings granted by EPA-authorized states, about which EPA does not have information. Because of the more stringent criteria, EPA expects to grant in final only about 33 (22 percent) of its own temporary delistings. It is reasonable to assume state-granted delistings would fare no better, particularly when the states modeled their process after EPA's. In addition, EPA has visited 37 (of 657) sites to verify the information submitted in delisting petitions. Although not a statistically valid sample, EPA is finding a 70-percent error rate in the sites visited. EPA cites other priorities and insufficient resources as reasons for the limited action in these areas. (See ch. 4.)

**National Biennial Report on
Hazardous Wastes**

Although the Congress requires handlers to report biennially the amounts and types of hazardous wastes generated, treated, stored, and disposed, EPA was unable to compile the 1981 or 1983 information into a national report because of incomplete and inaccurate data. EPA believes that several factors caused the poor data, including lack of EPA and state emphasis on the task and weaknesses in the way in which the data were collected. EPA is taking actions to improve the quality of the information it collects, but most of these may be too late to improve the 1985 data, which handlers submitted in March 1986. It is too soon to tell how effective EPA's actions will be in producing a reliable report on 1987 hazardous wastes. In the meantime, EPA and the Congress do not have accurate estimates of the types and quantities of hazardous wastes being handled for making policy and regulatory decisions. (See ch. 5.)

Recommendations

To improve EPA's identification and delisting of hazardous wastes, GAO recommends that the Administrator, EPA

- develop plans of necessary actions to identify the hazardous wastes needing control, including the remaining large-volume waste studies, with milestones, resources, and organizational responsibilities;
- determine which wastes states delisted in final, assess the potential impact of those delistings, and maintain oversight on future state delistings; and
- implement controls, such as increased site visits, to ensure that EPA has complete and accurate information when evaluating delisting petitions.

Agency Comments

The views of responsible officials were obtained during our review and are incorporated into this report where appropriate. As requested, GAO did not obtain official agency comments on a draft of this report.

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Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
PCB	polychlorinated biphenyl
RCED	Resources, Community, and Economic Development Division
RCRA	Resource Conservation and Recovery Act

Introduction

Ten years ago, concerned about hazardous and other wastes and their effect on human health and the environment, the Congress passed the Resource Conservation and Recovery Act (RCRA) of 1976. A major section of the act, subtitle C, required the Environmental Protection Agency (EPA) to promulgate regulations to control the nation's hazardous wastes from their generation to their final disposal. In responding to this mandate, EPA established programs to identify hazardous wastes and regulate hazardous waste handlers, including generators and treatment, storage, and disposal facilities. The Congress has since passed several amendments to RCRA, requiring additional specific actions of EPA.

RCRA defines hazardous wastes as those materials or substances that individually or combined may cause or contribute to death or serious illness or, when improperly managed, may threaten human health or the environment. RCRA requires EPA to determine which wastes must be managed as hazardous. Under EPA regulations, a waste is considered hazardous if it exhibits a hazardous waste characteristic, has been listed as a hazardous waste by EPA because of its hazardous constituents, or is a mixture that contains a listed hazardous waste.¹ EPA initiated a delisting program to allow exclusion of a handler's individual waste from regulation if the handler can prove that the waste does not exhibit the particular hazardous characteristic or contain the hazardous constituents for which the waste was listed. This could occur if a handler uses different raw materials or different production processes.

In addition, the Congress decided that certain types of waste should not be considered hazardous wastes because they do not present a significant threat to human health or the environment or are currently managed under other programs in ways that minimize that threat, such as domestic sewage wastes. The Congress also temporarily excluded several large-volume wastes, such as mining wastes, and required EPA to study these wastes to determine whether they are hazardous and should be controlled.

RCRA also required that EPA establish regulations for hazardous waste handlers. As of September 1986, EPA had on record about 77,000 generators and about 4,800 treatment, storage, or disposal facilities handling hazardous wastes.² Generators are primarily those who first create the waste. They must determine if any of their wastes are hazardous and, if

¹The hazardous waste characteristics EPA identified are ignitability, corrosivity, reactivity, and extraction procedure toxicity. (See ch. 2.)

²The 77,000 generators include only those who generate more than 1,000 kilograms per month.

so, ensure and document that the hazardous waste they produce is properly identified, treated, stored, and disposed. Among other administrative requirements, they must also obtain an EPA identification number, keep records, and report biennially to EPA on their hazardous waste activities.

Treatment, storage, and disposal facilities include storage tanks, incinerators, and landfills. Treatment is generally any method designed to render the waste less hazardous or nonhazardous. Storage is holding the hazardous waste for a temporary period, and disposal is discharging or placing the waste into the ground or water. These facilities must obtain an operating permit and are required to apply performance standards to minimize the release of hazardous waste into the environment. They also must obtain EPA identification numbers, keep records, and report biennially to EPA on their hazardous waste activities.

The RCRA hazardous waste program, with an estimated federal budget of \$238 million in fiscal year 1986, is implemented by both EPA and the states.³ States may apply to EPA for the authority to run the program, which includes such activities as inspection, enforcement, and permitting. In doing so, the states may adopt the federal program or develop their own program that is more stringent or broader in scope than the one applied nationally. As of September 1986, 41 states were authorized to run the hazardous waste program and 15 were unauthorized. EPA provides financial grants to assist authorized states in administering their hazardous waste programs.

Objectives, Scope, and Methodology

By letter dated April 9, 1985, the Chairman, Subcommittee on Commerce, Transportation and Tourism, House Committee on Energy and Commerce, expressed concern about EPA's progress in identifying hazardous wastes that need to be controlled. In subsequent meetings with the Chairman's office, it was agreed that the objectives of our work would be to examine and report on the following:

- EPA's approach and progress in determining which wastes are hazardous and must be regulated.

³As in RCRA, the term "state" means any of the several states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

- EPA's progress in completing five RCRA-mandated studies on large-volume wastes exempt from regulation. The specific wastes are those associated with mining and ore processing, oil and gas drilling, combustion of fossil fuels, cement kiln dust, and domestic sewage.⁴
- EPA's actions to review the delistings that authorized states granted to handlers petitioning to have their wastes excluded from regulation and EPA's actions to ensure the accuracy of delisting petitions.
- EPA's attempts to produce a biennial report on the types and quantities of hazardous waste generated, treated, stored, and disposed of nationwide.

We performed our work primarily at the Washington, D.C., headquarters offices of EPA. We interviewed hazardous waste officials from California, Georgia, Indiana, Kansas, New Jersey, Oregon, Pennsylvania, and Washington, for state views on the issues. Our selection criteria are discussed below. To get an overview of the state perspective, we interviewed staff of the Association of State and Territorial Solid Waste Management Officials. For public and private interest group views, we interviewed staff of the Environmental Defense Fund and the Chemical Manufacturers Association.

To review EPA's approach and progress in determining which wastes are hazardous and should be regulated, our first objective, we reviewed the legislative requirements for waste identification, interviewed program officials responsible for hazardous waste identification, and reviewed subsequent rulemaking and regulations by EPA. To contrast EPA's actions with those of the states, we interviewed officials in California, Oregon, and Washington. These states were selected because they identified and controlled additional hazardous wastes not regulated by EPA. We also reviewed an Environmental Defense Fund report on state hazardous waste identification. To identify changes under consideration and issues to be addressed, we reviewed a June 1986 discussion paper by the EPA division director responsible for hazardous waste identification on options for defining hazardous wastes under RCRA and the Office of Solid Waste's April 1986 draft hazardous waste implementation strategy. Chapter 2 contains information on EPA's hazardous waste identification program.

⁴We did not determine the technical adequacy of EPA's approach to identifying hazardous wastes, nor that of two RCRA-mandated studies that were issued.

To determine EPA's progress in completing five RCRA-mandated studies, objective two, we interviewed present and former hazardous waste program officials responsible for four of the studies and officials of EPA's Office of Water, which is responsible for the fifth study. We also reviewed the legislation and legislative history of the studies to determine congressional intent. To get information on the early years of the studies, we interviewed former Office of Solid Waste personnel who worked on the studies but are now in other EPA offices. To determine progress on the domestic sewage study, we reviewed plans, contract files, and other records from the Office of Water. To determine what work had been initiated or completed on the remaining studies and what the level of effort had been, we reviewed contract files, internal correspondence, and other records related to the studies from the Office of Solid Waste and the Office of Research and Development. Because these records were incomplete, we also interviewed officials in EPA's Office of General Counsel and reviewed documents relating to two lawsuits filed against EPA regarding two studies that had not been completed. We also reviewed two studies that were issued, an EPA report on comments from public hearings and a regulatory determination on one study and an advance notice of proposed rulemaking on the other study. Chapter 3 contains information obtained on the mandated studies.

For objective three, to examine EPA's actions to review state-authorized delistings and to ensure the accuracy of delisting petitions, we interviewed program officials responsible for delisting. To gather information on state delegated delisting activities, we contacted hazardous waste officials in California, Georgia, Indiana, Kansas, New Jersey, and Pennsylvania. We selected these states because they were in regions that had state final delistings and they had granted the most final delistings in their regions, according to an EPA contractor report. To determine EPA's authority and responsibility to review state delisting actions, we interviewed officials in EPA's Office of General Counsel. In addition, we also reviewed (1) an EPA contractor report on state delisting activities, (2) status reports on the delisting petitions EPA received up to August 21, 1986, (3) instructions to state and regional offices, (4) guidance documents for petitioners and petition reviewers, and (5) final and proposed delisting actions. To determine the extent to which EPA verifies information contained in delisting petitions, we reviewed EPA trip reports of site visits to handlers petitioning for delistings. Chapter 4 contains information on the delisting program.

To determine EPA's attempts to produce a national biennial hazardous waste report, objective four, we interviewed officials in EPA's Office of

Solid Waste responsible for the previous and current biennial reports. We also interviewed officials from the contracting firms that compiled the 1983 biennial report data. To identify the actions EPA took to produce a biennial report, we reviewed EPA documents, including EPA reporting instructions and forms, records of the contracts let to compile the biennial information, and the draft 1983 national biennial report. To identify problems with the 1983 biennial report, we reviewed state-submitted biennial reports, EPA's strategy document on the biennial reporting problems, and a report by one of the contractors on the problems encountered. To determine what steps EPA plans to take to produce subsequent biennial reports, we reviewed contracts let to correct the problems encountered earlier and EPA documents on its plans for future biennial reports. To determine the need for a national biennial report, we reviewed the legislative history of the RCRA reporting requirement, EPA rulemaking documents, and other internal EPA records identifying the importance of such information. Chapter 5 presents information obtained on the national biennial report.⁵

We performed our work from October 1985 through August 1986 in accordance with generally accepted government auditing standards. The views of directly responsible officials were obtained during our work and are incorporated in the report where appropriate. As requested, we did not obtain official agency comments on a draft of this report.

⁵For a broader perspective, GAO testimony before the Subcommittee on Environment, Energy, and Natural Resources, House Committee on Government Operations, The Condition of Information on Hazardous Waste, Sept. 24, 1986, synthesizes information currently available on the volume of hazardous waste generated nationally and the capacity available to process that hazardous waste now and in the future.

EPA Has Made Limited Progress in Identifying Additional Wastes That Are Hazardous

The first step to successful nationwide regulation of the management and disposal of hazardous wastes is identifying which wastes present a clear threat to human health and the environment. Despite the importance of this, however, EPA has made limited progress in identifying hazardous wastes. EPA does not know whether it is controlling 90 percent of existing hazardous wastes—or 10 percent; likewise, it does not know if it is controlling the wastes that are most hazardous. At present, the disposal of dangerous wastes, such as certain pesticides and known carcinogens, is not being regulated by EPA.

In 1976 the Congress required EPA to determine, using two approaches, which wastes are hazardous and need to be controlled. Developing criteria for the characteristics that comprise a hazardous waste, such as whether it is ignitable or corrosive, is one approach, and listing specific hazardous wastes, such as wastewater sludge from the production of various products, is the other. In 1980 EPA promulgated criteria for four characteristics of a hazardous waste and listed about 450 known and generally agreed-upon hazardous substances and production-process wastes. Since that time EPA has added no new characteristics and has listed only five additional specific wastes.

The Congress in the 1984 RCRA amendments directed EPA to identify additional hazardous waste characteristics and to evaluate 19 specific substances to determine whether they should be controlled as hazardous wastes. Although EPA had work underway on many of these substances, the Congress was concerned about its lack of progress. Deadlines for completing the tasks were mandated. While EPA has met some of these deadlines, more work remains to be done and it may be up to 2 years before EPA regulates and controls the wastes that it finds to be hazardous.

According to EPA program officials, progress in developing characteristics and listing specific hazardous wastes has been hampered by competing priorities and insufficient resources, along with the technical difficulties associated with such tasks. In addition, EPA has carried out its identification program without a management plan specifying the required steps, milestones, resources, and organizational responsibilities necessary for completion. EPA does not know how long it will take to complete the identification process for all potential hazardous wastes, nor has it identified which industries and characteristics remain to be studied. EPA is in the process of implementing major changes in its hazardous waste identification efforts, but many issues remain unresolved

at the program level. Therefore, it is too early to assess how successful EPA will be in speeding the identification of health-threatening wastes.

EPA's Approach to Identifying Wastes That Need to Be Controlled

Section 3001 of RCRA requires that EPA (1) develop and promulgate criteria for identifying the characteristics of hazardous waste and (2) list specific wastes that are considered hazardous and thus subject to regulations and control under the act.

In 1980 EPA established the basic framework and criteria it uses for determining which wastes are hazardous. This framework specifies, in part, that a waste is hazardous if it

- exhibits, on analysis by the handler, any of the characteristics or properties of a hazardous waste established by EPA or
- is listed by EPA as a hazardous waste because it contains hazardous constituents.

EPA's philosophy has been that characteristics define broad classes of wastes that are clearly hazardous. For example, waste with a low flash point (i.e., that spontaneously ignites at a low temperature) have the characteristic of ignitability. Listing, on the other hand, is used for specific wastes that may not meet the characteristics tests but are nonetheless hazardous wastes, such as certain industrial solvents.

EPA's initial approach focused on identifying characteristics rather than identifying and listing specific wastes. After the Congress passed RCRA, EPA considered over a dozen potential characteristics that would help classify a waste as hazardous but, in 1980, promulgated definitions and tests for four: ignitability, corrosivity, reactivity, and extraction procedure toxicity.¹ EPA defined and established tests for determining if a waste is hazardous because of the level at which it ignites, corrodes, or explodes. For extraction procedure toxicity, EPA set concentration levels for 14 toxic hazardous substances that could contaminate groundwater. For other characteristics that EPA considered, such as radioactivity, carcinogenicity, organic toxicity, and infectiousness, EPA determined that it could not define and construct tests to measure these factors.

¹The extraction procedure toxicity characteristic is a measure of the tendency of a waste to seep or leach dangerous concentrations of 14 specific toxic constituents into the groundwater. The term "toxicity," however, encompasses all toxic substances that can cause acute or chronic health damage, such as carcinogens and mutagens. On June 13, 1986, EPA proposed to replace the current extraction procedure with a new test and to expand to 52 the total number of toxic constituents evaluated by the test. This proposal is discussed further in the following section.

Because it was unable to do so, EPA shifted its emphasis to identifying and listing specific substances as hazardous wastes. In 1980 EPA identified and listed by name about 450 commercial chemical products and industrial-process waste streams that must be managed as hazardous wastes. To add to that list, EPA must develop support, through extensive testing and analysis, that proves a particular substance or process waste is hazardous. In refocusing on a listing approach, the primary burden for determining if a particular waste is hazardous shifted from the handler to EPA. That is, once EPA identifies a hazardous characteristic, all wastes exhibiting that characteristic must be regulated as hazardous and handlers are responsible for determining whether their specific wastes exhibit that characteristic. With listing, however, EPA must test and identify each waste before it can be added to the list, while handlers need only check their specific wastes against the lists. Using a listing approach, according to EPA, means that it will also take longer to identify and bring hazardous wastes under regulatory control.

Continuing Waste- Identification Actions Have Been Slow and Unproductive

Since 1980 EPA has made little progress in bringing additional hazardous wastes under regulation. No new characteristics have been identified. In addition, those characteristics that EPA has developed are incomplete, and specific waste listings have not filled the gap. In 1984 the Congress, disappointed with EPA's lack of progress in bringing additional hazardous wastes into regulation, mandated development of additional characteristics and the listing or listing determinations of 19 specific wastes. EPA, however, has not met the mandated deadlines for completing all of these tasks.

More Work Is Needed on Developing Characteristics

EPA announced as early as 1978 its intention to develop characteristic tests for radioactivity, genetic activity, bioaccumulation, toxicity to aquatic organisms, toxicity to plants, and toxicity to humans resulting from chronic exposure to organic chemicals. EPA did not promulgate these characteristics, however, primarily because of the lack of simple, well-accepted, and inexpensive tests that might be applied by waste handlers to measure these characteristics. Further, EPA has not completed the development of tests for measuring the four characteristics it has identified, although it acknowledged that more work was needed when it promulgated them in 1980. As of September 1986, no test exists for ignitable solids; the regulations for reactivity, ignitability, and corrosivity generally use descriptive narrative rather than objective measurements and tests for each characteristic; and extraction procedure

toxicity focuses primarily on metals and not organic toxicants, which would, for example, include many pesticides.

Dissatisfied with EPA's progress in developing characteristics, the Congress directed EPA in 1984 to (1) examine the deficiencies in the extraction procedure toxicity characteristic and, by March 1987, make changes as necessary to ensure that it accurately predicts the potential of hazardous wastes to seep, or leach, into groundwater, posing a threat to human health and the environment, and (2) identify, by November 1986, additional characteristics of a hazardous waste, including measurements or indicators of toxicity.

In response, EPA proposed in June 1986 the expansion of the extraction procedure toxicity characteristic to include 38 additional compounds and the introduction of a new extraction procedure, the toxicity characteristic leaching procedure. According to the proposed rule, the new procedure addresses the deficiencies in the extraction procedure by changing the test to detect both organic and inorganic toxic compounds. EPA's division director responsible for hazardous waste identification pointed out in a discussion paper, however, that even the new proposal may have shortcomings. For example, it (1) ignores potential interactions among waste constituents, (2) addresses migration only through groundwater and not surface water or air, and (3) sets concentration levels that may be too high to capture wastes needing control.

Nonetheless, EPA believes that this proposal will not only fulfill the mandate to improve the extraction procedure toxicity characteristic but also the mandate to identify additional hazardous waste characteristics. With respect to identifying additional characteristics, however, EPA has not yet developed any. As discussed later in this chapter, EPA is now considering placing much more emphasis in this area.

Listing Does Not Fill the Gap

Along with its lack of progress in developing additional hazardous characteristics, EPA has encountered problems in listing specific hazardous wastes, having listed only five additional hazardous wastes in the last 6 years.² The original lists, promulgated in 1980, were basically a compilation of known and generally agreed-on hazardous commercial chemical

²As of October 24, 1986, EPA had listed the following additional hazardous wastes: (1) certain wastes containing chlorinated dioxins, dibenzofurans, and phenols; (2) certain spent solvents and still bottoms from the recovery of those solvents; and certain wastes generated during the manufacture or production of (3) ethylenebis(dithiocarbamic acid and its salts (carbamate), (4) toluene diisocyanate and its intermediates, and (5) ethylene dibromide (organobromides).

products or production-process wastes. In 1981 EPA began what it calls its industry studies program, to develop additional listings. The first group of studies looked at wastes from four industries: organic chemicals (including most pesticides), inorganic chemicals (including paints and lithium batteries), petroleum refining, and wood preserving.

EPA identified approximately 5,000 waste streams for potential listing from approximately 1,000 production processes in these four industries. The first listing resulting from these studies came in 1985, nearly 4 years after the studies were initiated, and the program manager estimates it will take 2 to 3 more years for all the wastes from these first industry studies to be proposed for regulation. The process is lengthy, according to the program manager, because gathering data on wastes in order to support a listing determination can take up to 4 years, and it involves literature searches, questionnaires, site visits, and waste sample analyses. Also, once EPA has developed the data to support a listing determination, it must then initiate a rulemaking action for each listing, involving a proposed rulemaking, public comment with response, and final rulemaking, which can take up to 2 more years before the listed waste is brought under regulatory control. Thus, it could be 1990 or later before these wastes are brought under RCRA regulation if the listing process proceeds at its current pace.

Concerned about EPA's limited progress in listing hazardous wastes, the Congress in 1984 set deadlines for EPA to list or make listing determinations for 19 specific wastes of particular concern. The Congress directed EPA to (1) list chlorinated dioxins and dibenzofurans by May 1985, (2) list halogenated dioxins and dibenzofurans by November 1985, and (3) make listing determinations on 17 other waste categories by February 1986.

Although EPA issued a final listing on chlorinated dioxins and dibenzofurans in January 1985, ahead of the deadline, that listing did not include all chlorinated dioxins. For example, a proposal to list chlorinated dioxins in wastes from wood-preserving processes is still undergoing internal EPA review. Also, no action has been taken to list halogenated dioxins and dibenzofurans. Work on this listing was put on hold in January 1986 after the staff member responsible for it was reassigned without replacement. According to the program manager, as of August 1986, it is still on hold in the program group, with no projected proposal date.

For the 17 specified waste categories with a February 1986 deadline, five final rules (including one decision not to list, one interim final rule, and three proposed rules) have been published. Decisions on these nine wastes met the deadlines. However, as of October 1986 the decisions on the remaining eight categories have not cleared internal EPA review. Also, after those determinations clear internal review, it may, as noted above, take up to 2 years to complete the lengthy rulemaking process before wastes that EPA determines to be hazardous are brought under RCRA regulation.

Some Hazardous Wastes Are Not Yet Controlled

In addition to limited progress in completing the initial round of industry studies and in meeting statutory deadlines for making regulatory determinations on specific wastes, EPA has not determined the universe of industries that must be studied nor the length of time it will take to assess and review all potentially hazardous waste streams from those industries. However, EPA reports that there are more than 60,000 chemicals manufactured or used today, creating an even greater number of distinct waste streams for potential listing review.

EPA does not know if it has identified 90 percent of the potentially hazardous wastes or only 10 percent, according to the division director responsible for hazardous waste identification.³ EPA also does not know whether the wastes not yet listed or subject to a characteristic pose little hazard or are highly toxic. Among the hazardous substances and wastes not brought under RCRA control in EPA's 1980 regulations were dioxins, polychlorinated biphenyls (PCBs), some of the carcinogens listed by the International Agency for Research on Cancer, and many insecticides and herbicides.⁴ Also, as noted earlier, since the characteristics identified in the regulations are incomplete, some wastes that could be captured by these characteristics are not being regulated by RCRA.

Some states, through both additional characteristics and listed wastes, regulate a larger universe of wastes as hazardous than EPA has identified. At least four states have developed additional characteristics, such as carcinogenicity or acute toxicity, that are bringing additional hazardous wastes into regulation. An Environmental Defense Fund study

³"Discussion Paper on Options for Defining Hazardous Waste Under RCRA," June 12, 1986.

⁴Although PCBs are controlled under the Toxic Substances Control Act, their transport for disposal and extended storage are not controlled. In addition, although insecticides and herbicides are controlled by the Federal Insecticide, Fungicide, and Rodenticide Act, the disposal of manufacturing wastes generated during production and of products that do not meet specifications for use are not.

entitled State Regulation of Hazardous Waste reports that California, Oregon, Rhode Island, and Washington regulate additional characteristics.⁶ The study also reports that several other states are regulating additional listed wastes, such as PCBs and waste oil. These include, in addition to the four named above, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, and Oklahoma. One state, Washington, estimates that its standards and tests capture 25 percent more hazardous waste than it would using EPA's regulations.

According to the EPA division director responsible for hazardous waste identification, an initial review of wastes regulated in states with more comprehensive hazardous waste definitions suggests that potentially large numbers of wastes remain to be identified. The director states in a discussion paper that some of the state-only controlled wastes are being evaluated by EPA for potential regulation. If determined to be hazardous by EPA's definition, these wastes will have to undergo formal rulemaking actions to bring them under federal regulation. Nonetheless, the director notes that it seems reasonable to conclude that significant quantities of potentially hazardous wastes are not yet captured under federal regulation.

EPA Is Implementing Major Changes to Its Waste Identification Program

As part of its implementation of the 1984 RCRA amendment requirements, EPA is reviewing its strategy and programs for identifying hazardous wastes. As of August 1986, EPA is in the process of implementing major changes to its overall identification program. One major change EPA is implementing involves refocusing hazardous waste identification back to an emphasis on developing characteristics. A second change involves relisting the already identified listed wastes by developing concentration levels below which the wastes would not be classified as listed hazardous wastes. EPA will focus its listing activities on relisting and completing work on the wastes specified in the 1984 RCRA amendments. These changes, discussed below, may have a major impact on EPA's future hazardous waste identification. EPA is still discussing many of the issues involved, however, and does not know when it will make final the details for implementing either change at the program level.

New Strategy Refocuses on Characteristics

EPA is considering implementing a new strategy for identifying hazardous wastes, refocusing on characteristics as the main approach for identification. The strategy proposes to broaden and complete the

⁶Ecology Law Quarterly, Vol. 12, No. 2, 1985.

existing characteristics and develop additional ones. As a first step, a June 1986 reorganization of the Office of Solid Waste—the office responsible for hazardous waste identification—established characteristics as a separate program activity and centralized listing and characteristics under one branch chief to improve the organizational focus of the two programs. Up until that time, developing characteristics was not a separate program responsibility, but rather a portion of another program in a different branch than the listing program.

The branch chief responsible for the two identification programs following the reorganization intends to begin the expanded characteristics effort with work to expand the toxicity characteristic to include tests for organic toxicants and to develop test methods for ignitable solids. He also plans to explore developing the characteristics for radioactivity and genetic toxicity.

A major advantage of a characteristics over a listing approach is that it enables EPA to identify for regulation as hazardous all the wastes with a particular characteristic at one time, without gathering information about the specific wastes or waste streams that will be captured by that characteristic. According to the division director responsible for identification, many of the problems in EPA's current identification approach result from its relatively heavy use of listings. In a discussion paper the director notes that listing individual wastes one-by-one is simply inefficient and expensive when compared with using more general criteria for defining what is hazardous (i.e., characteristics). Furthermore, because the listing process is time-consuming and slow, many hazardous wastes may not yet be subject to RCRA control—and may not be for many years. This failure to bring hazardous wastes under control, according to the director, presents the obvious problem of potential threat to human health and the environment.

There are also disadvantages to relying on a characteristics approach, however. EPA points out that a major obstacle to a more extensive use of characteristics is, as it has been in the past, the availability of reliable characteristic tests for determining if a waste is hazardous. Also, characteristics that are defined by constituent concentrations, such as the extraction procedure toxicity characteristic, create incentives to dilute or mix wastes to avoid regulation. This is desirable where the hazardous property is minimized by dilution (for example, where constituents degrade rapidly), but may not be in instances where the hazard does not

depend on the concentration (for example, where the hazardous constituents accumulate in body tissue). Another unsettled concern with concentration levels focuses on the level at which a characteristic waste becomes hazardous. For example, is EPA's concentration level of 5 milligrams of arsenic per liter too stringent or not stringent enough? In a discussion paper, the division director responsible for identification notes that EPA's reluctance to use characteristics for wastes of marginal risks reflects concern over the potential for stringent concentration levels to cause significant over-regulation. She points out, however, that limiting the use of characteristics to wastes presenting significant hazard—which results when concentration levels are set high—would not capture many wastes still regarded as hazardous. These hazardous wastes would have to be brought under regulation using time-consuming individual listings.

A characteristics approach also makes it difficult for regulators to easily determine which waste streams at a generating facility are actually hazardous for enforcement purposes. For example, an inspector would not know if the waste from a facility with a nonlisted waste needs to be regulated as hazardous because it exhibits a hazardous characteristic without actually testing a sample of that facility's waste. EPA has not yet decided how it will address the disadvantages of using a characteristics approach.

Relisting Sets Concentration Levels for Already Listed Wastes

EPA is also "relisting" the already listed 450 hazardous wastes. Under the existing listing approach, wastes are listed as hazardous regardless of the concentration levels of the hazardous constituents in the waste. Through relisting, EPA is going back to each listed waste and identifying or developing appropriate testing methods to measure the amount of hazardous constituents in the waste. Using risk-based analysis, EPA is also establishing the concentration levels at which a hazardous constituent would cause a waste to be classified as hazardous. Thus, if the concentration of hazardous constituents in a waste is below the set level, the waste would no longer be considered a listed hazardous waste. EPA initiated this approach as it became increasingly clear that large amounts of wastes were being regulated even though they had concentration levels of hazardous constituents that did not pose hazardous threats.

EPA has identified at least two potential problems with relisting. One is the potential dilution problem discussed above where the handler dilutes or mixes the waste for the purpose of getting the concentration

of hazardous constituents below the set levels. Another concern rests with combining large quantities and/or many types of wastes that are individually below the set levels but which in combination meet a hazardous level. A great deal of uncertainty exists over the hazardousness of the mixture that would result from codisposing those wastes in a landfill. According to EPA program officials, these are serious issues that EPA has not yet resolved.

Better Planning Needed to Guide Waste- Identification Program

With both the characteristics and listing approaches to identifying hazardous waste, it was difficult to review EPA's past performance because hazardous waste identification action has not been consistent and has not been directed by an overall management plan that prioritizes the work, sets milestones, and identifies resources needed to complete the tasks. According to program officials, until now there has never been a specific plan to manage the identification program in terms of EPA's waste identification strategy. Rather, they note that past work has been directed and redirected in a crisis mode of management. We asked the branch chief responsible for the two identification programs if he will develop a plan for implementing EPA's new strategy at the program level. He said he intends to, but it is too early to do so.

Conclusions

EPA has made limited progress in identifying hazardous wastes that need to be controlled. Ten years after the Congress mandated the identification and control of hazardous wastes, EPA cannot say what portion of the universe of hazardous wastes it has identified and brought under regulation, or even if it is regulating the worst wastes in terms of potential impact on human health and the environment. Its waste identification activity has been hampered by low or changing priorities and changing approaches or strategies.

Dissatisfied with EPA's progress, the Congress in 1984 mandated stepped-up identification by requiring EPA to develop additional characteristics and to make regulatory decisions on listing specific wastes. EPA has not met all of the deadlines imposed by the Congress for these actions, and more work needs to be done.

Currently EPA has made or is considering making major changes to its waste identification program. It has reorganized its identification activities under one office; it is relisting currently listed wastes, specifying

what concentration levels make the waste hazardous; and it is considering a return to using characteristics as the basic approach to identifying additional hazardous wastes. EPA recognizes potential problems with enforcing characteristic criteria and concentration-based listings but has not reached a decision on how to resolve these problems.

EPA needs to follow this up with a plan to implement its actions at the program level once it decides on the basic approach it will take to identify hazardous wastes. Once completed, such a plan could not only serve to guide EPA's hazardous waste identification program but could also inform the Congress and others how long it will take to complete the process and provide a benchmark to assess EPA's performance.

Recommendation

To improve EPA's progress in identifying hazardous wastes, we recommend that the Administrator, EPA, develop a plan laying out what actions will be necessary to identify the universe of wastes needing control. Such a plan should contain, as a minimum, the additional waste characteristics that need to be developed and the industry waste streams that need to be evaluated, milestones to accomplish these tasks, needed resources, and organizational responsibilities for completing these actions.

EPA Has Made Limited Progress in Completing Exempted-Waste Studies

The Congress not only required EPA to determine which wastes are hazardous and need to be controlled, as discussed in chapter 2, but also required EPA to study five large-volume wastes to determine their potential impact on human health and the environment and set deadlines for completing the studies. EPA has completed two of the five studies, one by its mandated deadline and the other 6 years after its original deadline and 2 years after its extended deadline. However, more information is needed on both studies. The three remaining studies are already 3 to 4 years late. According to EPA, higher priorities, staffing problems, and inadequate funding prevented the completion of the studies by the deadlines.

For four wastes (mining and ore processing wastes, oil- and gas-drilling wastes, coal and other fossil fuel combustion wastes, and cement kiln dust), the Congress directed EPA to study, among other things, the environmental and economic impact of regulation. Additionally, the Congress mandated a separate study of wastes mixed with domestic sewage to verify that such wastes are controlled adequately under the pretreatment program of the Clean Water Act. Until all of the required information is obtained for the two issued studies and the remaining studies are completed, EPA and the Congress will not know the extent of additional regulations that may be needed for management of these wastes. EPA has recently taken a number of steps to improve its study performance, including reorganizing the study efforts under one office, providing additional staff and resources, and developing plans for the studies remaining to be completed.

Congress Requires Exempted-Waste Studies

From 1976 to 1984, in a series of amendments to RCRA, the Congress mandated that EPA study several large-volume wastes to determine the need for their regulation. In 1976 the Congress, concerned about the lack of information on the hazards of mining wastes, directed EPA to conduct a study of the adverse effects of improper management of these wastes, the sources and volumes of these wastes, existing methods of waste disposal, and the need for controls to protect public health and the environment. The Congress set a 3-year deadline of October 1979 for completion of this study.

In 1980 the Congress required additional studies on cement kiln dust, wastes generated from oil and gas drilling, the waste resulting from the combustion of fossil fuels, and ore processing wastes, for the purpose of

determining whether regulation of these wastes was necessary.¹ Among other things, all of the studies were to include estimates of (1) the source and volumes of these wastes, (2) the potential dangers to human health and the environment caused by exposure to the wastes, (3) current and alternative waste-disposal practices, including the potential for recycling, and (4) an assessment of the potential economic impact resulting from regulation. In the absence of a completed mining waste study, the Congress expanded the scope of the mining waste study and required that it be done in conjunction with the ore processing waste study. It specified that each of these waste categories should remain exempt from regulation until the studies were completed and that the Administrator of EPA should, within 6 months of publication of the studies, determine if regulation is necessary. The Congress gave EPA 2 years (by October 1982) to complete the fossil fuels and oil- and gas-drilling studies and 3 years (by October 1983) to complete the combined mining waste and ore processing study and the cement kiln dust study.

In 1984 the Congress cited a lack of information on potential threats to human health and the environment posed by wastes exempt from RCRA regulation under a domestic sewage exclusion. Under this exclusion mixtures of domestic and other wastes passing through a sewer system to a publicly owned treatment works facility are regulated under the Clean Water Act. The Congress also directed EPA to identify the generators disposing of these wastes in this manner, to determine the quantities of hazardous wastes so disposed, and to identify significant generators or wastes not sufficiently regulated to protect human health and the environment. The Congress required that EPA complete the study by February 1986. The Congress also stipulated that EPA develop regulations within 18 months of the study's completion for any substances identified in the study as not adequately controlled.

EPA Missed Most Study Deadlines

As of October 1986, EPA has issued only two of the required five studies, a combined study on mining and ore processing wastes and the domestic sewage exclusion study. Only the domestic sewage exclusion study was issued by the statutory deadline. EPA missed the original deadline for the other completed study by 6 years and its extended deadline by 2 years.

¹The Congress described oil- and gas-drilling wastes as drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas, or geothermal energy. Cement kiln dust is the emission or dust resulting from incineration of materials in cement kilns. Wastes from the combustion of fossil fuels include fly ash, slag, and other by-product materials generated primarily from the combustion of coal or other fossil fuels. Ore processing wastes include those from extracting and processing ores and minerals.

The three other studies that remain to be completed are already 3 to 4 years late, and EPA does not expect to complete them for another 6 months to 2 years, citing resource limitations and conflicting priorities for the delays. Table 3.1 indicates the original deadlines for the studies and EPA's actual and projected dates for completing them.

Table 3.1: Status of EPA's Exempted-Waste Studies

Study	Statutory deadline	Date completed	Projected completion date as of 10-86
Mining wastes	10-79 ^a		
	10-83	12-85	•
Fossil fuels	10-82	•	2-87 ^b
Oil and gas	10-82	•	8-87
Cement kiln dust	10-83	•	8-88 ^c
Domestic sewage	2-86	2-86	•

^aThe original statutory deadline was October 1979. The Congress changed the deadline in 1980 to October 1983 so that the study could be completed in conjunction with the ore processing study.

^bPartial study. As discussed later, this study will address coal-fired boiler fly ash. EPA intends to address other fossil fuel combustion wastes under a separate study, but it has not yet projected a completion date for this work.

^cBecause fiscal year 1987 funds have not been budgeted for this study, EPA expects to change the projected completion to a later date.

Mining and Ore Processing Waste Study Late

One of the two exempted-waste studies EPA issued was the combined mining and ore processing waste study. EPA issued it on December 31, 1985, more than 6 years after the original mining waste study deadline and more than 2 years after the deadline for the combined report. The issue date complied with a court order set in *Citizens of Adamstown, Maryland et al v. EPA*, requiring completion of the combined study by that date. According to the branch chief responsible for these reports, it is EPA's practice to prepare a developmental or study plan for regulatory studies, but he could not locate any previous plan for this study or any of the others.

Chronological and funding documentation covering the 9-year span of this study was difficult to construct because of the passage of time involved and the turnover of EPA staff. EPA could not provide us with a study plan used in conducting this study, nor could it provide a complete file containing records documenting decisions and events occurring during the study. However, according to EPA depositions assembled for the lawsuit, EPA issued contracts for studies of mining wastes as early as

1976 and spent approximately \$5.5 million in contracts before completing the study. Although EPA published a notice in the Federal Register announcing the availability of a draft report of the mining waste study on March 12, 1978, that study was not sent to the Congress because it was not considered to be complete. According to the former chief of the Waste Management and Economic Analysis Branch in EPA's Office of Solid Waste, the study lacked the necessary regulatory cost analyses. He also said the 1980 amendments added new study requirements before the report was completed and prompted EPA to hold the report until the additional work was done. The chief also said that EPA missed the October 1983 deadline established in the 1980 amendments because EPA management did not consider the study to be a high priority and thus did not provide adequate staff and funding. In addition, staff were diverted from this project to work on other EPA priorities. In 1981, for example, staff were taken from this project to work on implementation of land-ban disposal provisions of RCRA. He also said that, after the Adamstown lawsuit, EPA management increased the resources devoted to the study.

**Fossil Fuels Study Not
Completed**

One of the three exempted-waste studies EPA has not yet issued is the fossil fuels study. Over 3 years after the October 1983 deadline, EPA expects to have a study limited to fly ash produced by coal-fired boilers by February 1987. The Congress, however, required that the study include by-products from the combustion of other fossil fuels as well. EPA began the study of fly ash produced by coal-fired boilers first because it believes that this accounts for the largest volume of fossil fuel wastes. Under the direction of the Office of Research and Development, an EPA contractor began work on the study in 1979. Although the contractor provided a final report in November 1984 at a cost of \$4.1 million, it was delivered about 3 years after the original contract date and did not include all of the information required in the original scope of work. EPA files indicate that it was aware of problems that the contractor was experiencing during the course of the work and EPA staff met with the contractor to resolve the problems. Even so, EPA initially attempted to write the study based on a draft of the contract study.

In May 1985 EPA hired a new project officer to oversee completion of this study and the other remaining studies because the former project officer was reassigned to other work in March 1984. The new project officer determined that additional work was necessary to complete the study, such as an analysis of threats to human health and the environment posed by coal-fired boiler ash. EPA budgeted \$680,000 for this

effort in fiscal year 1986. As of October 1986, he expects to issue a report to the Congress in February 1987. He plans to begin work on studies of other wastes produced by combustion of fossil fuels after this study is completed. As with the mining waste study, EPA could not provide a study plan containing information requirements, milestones, resource needs, or organizational responsibilities.

**Oil and Gas Study Not
Begun Until 1983**

Another of the exempted-waste studies EPA has not yet issued is the oil and gas drilling fluids study. Although the Congress required this report by October 1982, EPA does not plan to issue the report until August 1987. EPA management did not consider it a high priority project until a lawsuit seeking the study's completion was filed by the Alaskan Center for the Environment in July 1985. EPA reached an out-of-court settlement with this group in August 1986 by agreeing to complete the study by April 1987 and to deliver the report to the Congress in August 1987. To carry out the study, EPA budgeted \$300,000 in fiscal year 1986. As discussed below, EPA is now preparing a study plan.

**No Work Initiated on
Cement Kiln Dust Study**

Although the cement kiln dust study was due to the Congress in October 1983, as of October 1986, it had not yet been started. According to the branch chief formerly responsible for the study, EPA considered this waste to be the least hazardous among those it was supposed to study, so it deferred work on it. According to the branch chief now responsible for the study, EPA has set a target deadline of August 1988 for delivery of this study to the Congress. However, he said that EPA's fiscal year 1987 budget does not include funds for this study, so the deadline will have to be changed to a later date.

**Domestic Sewage Exclusion
Study Issued by Deadline**

Unlike the previously mentioned studies, the domestic sewage exclusion report had a management plan detailing the study's information requirements, milestones, resource requirements, and organizational responsibilities, and it was issued on schedule in February 1986. As mandated by the Congress, EPA has until August 1987 to promulgate any necessary regulations for improved protection of the public health and the environment.

Questions Concerning Adequacy of Completed Studies

We did not evaluate the technical adequacy of the completed mining waste and the domestic sewage exclusion studies. We did, however, compare the information requirements stated in the statutory mandate for the studies with the information contained in the final reports. From this comparison, it appears that neither study contains all of the information that the Congress desired, although the domestic sewage exclusion study appears to be more complete than the mining waste study.

Mining Waste Study

In requiring the mining waste study, the Congress directed EPA to include in the study materials generated from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from uranium mining.² Among other things, the Congress required an analysis of (1) the source and volumes of wastes generated per year, (2) present disposal and utilization practices, (3) potential danger, if any, to human health and the environment, (4) alternatives to current disposal methods, and (5) costs of such alternatives.

EPA's study includes extraction and beneficiation wastes but excludes ore and minerals processing wastes.³ EPA's summary of public comments on the mining waste study indicated that 18 commenters noted the omission of ore and minerals processing wastes and stated that the report was incomplete without addressing those wastes. In its study EPA indicated that it did not include ore processing wastes because it was then reviewing whether such wastes should have been initially excluded from regulation as hazardous waste. In compliance with the settlement agreement for the Citizens of Adamstown, Maryland *et al.* v. EPA lawsuit, EPA proposed a rule on October 2, 1985, to narrow, but not eliminate, the exclusion. On October 9, 1986, however, EPA published its final rule, which reinstated the exclusion. In its final rule, EPA said that decisions as to whether ore processing wastes should be regulated will be made after completion of further study.

²Extraction is the process of mining and removal of ore from a mine; beneficiation is the treatment of ore to concentrate its valuable constituents; processing is the removal of waste and unwanted substances from a product.

³EPA's mining waste study, Wastes from the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale, presented information on mining wastes and recommended that EPA further study wastes that (1) are radioactive, (2) contain cyanide, (3) have the potential to form sulfuric acid, or (4) have the characteristics of corrosivity or extraction procedure toxicity.

As noted above, the Congress also sought information on present disposal practices and the potential danger to human health and the environment, if any, from mining wastes. EPA's study contained sections on waste management practices and potential dangers to human health and the environment, but its analysis of the public comments on the study states that many commenters believe that the supporting evidence of damage and health effects is weak because the study failed to adequately distinguish between past and current mining and mine waste management practices. Some of those commenting also noted that the limited environmental effects identified in the study were generally associated with historical waste control practices that were no longer in use and that EPA failed to assess existing federal and state controls. EPA stated in a regulatory determination published in the Federal Register on July 3, 1986, describing the study results that it is not clear from its analysis whether current waste management practices can prevent damage from seepage or sudden releases. EPA agreed that it will need to (1) collect additional information on the nature of mining wastes, mining waste management practices, and mining waste exposure potential and (2) consider existing federal and state mining waste programs before developing additional regulations.

The Congress required EPA to determine within 6 months after submitting the study whether to regulate mining wastes as hazardous. In its regulatory determination EPA announced that it does not intend to include mining wastes under hazardous waste regulations because it is unclear whether RCRA hazardous waste regulations provide enough flexibility to tailor requirements to mining wastes, and because there are substantial questions about whether its current data on mining waste management provide a basis for substantial modifications to hazardous waste regulations. Instead, EPA announced its intention to develop and implement controls over mining wastes under a program directed at managing nonhazardous wastes. EPA plans to collect the information needed for program development, complete its data analysis by late 1987, and propose revisions in mid-1988. Regulation of nonhazardous wastes is largely a state responsibility. Therefore, should problems, such as the lack of federal oversight and enforcement authority or the lack of state resources needed for program implementation, make this approach unworkable, EPA stated that it may need to reexamine regulating certain mining wastes as hazardous.

Domestic Sewage Study

In requiring the study of domestic sewage wastes handled by publicly owned treatment works, the Congress directed EPA to study (1) the

types, size, and number of generators that dispose of hazardous wastes in sewers, (2) the types and quantities of wastes disposed of in this manner, and (3) the identification of significant generators or wastes not regulated in a manner sufficient to protect human health and the environment. Within 18 months of completing the study, EPA is to revise existing regulations and promulgate additional regulations if necessary.

EPA's study, as noted earlier, was issued by the mandated deadline, and it appears to address the information requirements listed above.⁴ However, more information is needed. Among other things, the study recommends that improvements be made in existing regulations governing wastes disposed into the sewers. In September 1986, EPA held hearings to obtain public comments and suggestions on possible ways to address the study's recommendations. The deadline established by the Congress for any additional regulations is August 1987. The study does, however, point out that research is needed to fill information gaps on sources and quantities of hazardous wastes, their effect on publicly owned treatment works systems and the environment, and their ultimate end. The study states that EPA has more complete information on the sources and quantities of the estimated 99,000 to 114,000 metric tons of priority pollutants classified as hazardous under the Clean Water Act and discharged into sewers annually.⁵ EPA has less information on the estimated 64,000 metric tons of nonpriority pollutants considered hazardous under RCRA and discharged into the nation's sewers annually. Until additional information on these nonpriority pollutants is collected, EPA will not know if additional regulations are necessary to effectively regulate these nonpriority pollutants considered hazardous under RCRA.

EPA Actions to Improve Its Study Performance

According to the section chief currently responsible for the exempted-waste studies, EPA has taken steps to resolve past problems with low or conflicting priorities, staff turnover and shortages, and inadequate funding. In a reorganization of the Office of Solid Waste in June 1986, EPA created a Large Volume Wastes Section charged exclusively with completing the exempted-waste studies. In announcing this reorganization, EPA said that these studies had not previously had an identifiable organizational focus. By creating a separate organization responsible for

⁴Report to Congress on Discharge of Hazardous Waste to Publicly Owned Treatment Works, Feb. 1986.

⁵EPA promulgated technology-based standards addressing 65 chemical compounds or classes of compounds, known as priority pollutants, and subsequently regulated them under the 1977 Clean Water Act amendments. The nonpriority pollutants include all others.

these studies, EPA hopes to avoid problems with reassignment of staff to handle other agency priorities.

The new Large Volume Wastes Section includes a section chief and four staff members, including a project officer for the mining waste study and a project officer for the fly ash and oil and gas studies. Dedicating five full-time staff members to work on these studies increases the level of effort previously provided.

Another step taken by EPA to improve the management of these studies was the development of study plans. EPA has begun to develop a plan for the oil and gas study, but no plans have been developed for the remaining studies. A final step taken by EPA to resolve problems with these studies was to increase the level of funding. For example, although no funds were allocated in fiscal year 1985 for the oil and gas study, \$680,000 was allocated in fiscal year 1986, and EPA has requested \$550,000 to complete the study in fiscal year 1987. Similarly, no funds were allocated in fiscal year 1985 for the fly ash study. However, \$300,000 was allocated in fiscal year 1986, and EPA requested \$150,000 in fiscal year 1987 to complete the study.

Conclusions

While completing one congressionally mandated study on time, EPA missed the original deadline on another by 6 years and its extended deadline by 2 years. EPA is currently 3 to 4 years late in completing three other studies. These are primarily studies of large-volume wastes that were initially exempted from regulation until the studies were completed. Among other things, the studies were to address the potential danger to human health and the environment from the disposal of such wastes, whether additional regulatory controls are necessary, and the potential economic impact of such controls. The mining waste study does not appear to have addressed all of the wastes or information requirements, and more information will be needed on this study and the domestic sewage study. As with the hazardous waste identification program discussed in chapter 2, until these exempted-waste studies are complete, EPA and the Congress will not fully know the universe of wastes needing control to protect human health and the environment. The studies or portions of studies that remain to be completed include the ore processing portion of mining wastes, oil and gas drilling fluids, fossil fuels (including noncoal-fired combustion boilers), and cement kiln dust.

EPA attributes the delays in completing the studies to conflicting demands, higher priorities, staff shortages, and inadequate funding. Our discussions with EPA officials and our review of EPA's study files, which were often incomplete and decentralized, tend to confirm these causes and to indicate that EPA has been reactive rather than proactive—sometimes responding only after lawsuits based on EPA's failure to complete the studies were filed. As discussed in chapter 2, lack of overall planning has adversely affected EPA's performance in determining which wastes are hazardous and need to be regulated. Similarly, EPA does not have specific study plans that management can use to keep the individual waste studies on target. This lack of detailed study plans may have contributed to EPA's poor timeliness and may also have adversely affected the completeness of the mining waste study. The domestic sewage exclusion study by contrast had a study plan and was completed on time. Although we did not perform a technical review of the completed studies, the domestic sewage exclusion study also appears to be more responsive to the information requirements than is the mining waste study.

EPA's recent actions to improve its performance in completing the remaining studies include (1) reorganizing the remaining studies under one office, thus giving the study effort more organizational visibility and priority, (2) assigning additional staff, (3) providing additional funds, and (4) developing study plans for the remaining work. These actions are a step in the right direction and should improve EPA's performance. The development of study plans is a critical step that affects other factors, such as resource requirements. Such plans, once complete, could serve not only in helping EPA manage the studies, but could also provide a benchmark for EPA, the Congress, and others in assessing EPA's performance.

Recommendation

For the remaining mandated studies or portions of studies yet to be completed, we recommend that the Administrator, EPA, develop study plans that include the information requirements the study is to address, milestones for completing the various stages of the study, resource needs, and organizational responsibilities.

Weaknesses Limit Effectiveness of EPA's Facility Delisting Program

Recognizing that its hazardous waste listings might not be applicable to all handlers of a specific waste stream, EPA in 1980 developed a process called delisting. Through this process waste handlers can petition EPA to exclude, or delist, their facility-specific listed waste from RCRA regulation by demonstrating that variations in their raw materials, processes, or other factors make the waste nonhazardous. In 1984 the Congress required EPA to apply more stringent criteria before granting future delistings. It also required that all temporary delistings, of which EPA had granted 150, meet the new criteria. The Congress required the more stringent criteria because EPA regulations prevented it from checking petitioned wastes for all possible hazardous constituents and, consequently, wastes that contained hazardous constituents or exhibited hazardous characteristics were being delisted.

EPA has begun applying the more stringent criteria to all petitioners, including those to whom it had granted temporary delistings. Although it has the authority to do so, EPA does not intend to apply the new criteria to the estimated 100 final delistings granted by states before 1984 because the law did not specifically require EPA to do so, and because of competing priorities. On the basis of its own experience, however, EPA reports that only about 22 percent of the temporary delistings it issued meet the new criteria and will be granted a final delisting.

To verify information supplied by delisting petitioners, EPA conducts a limited number of site visits and includes facilities it suspects submitted inaccurate or incomplete data. Although EPA is finding problems at 70 percent of the visited facilities, fewer than 6 percent of the sites, represented by the 657 petitions received since 1980, have been visited. The program manager characterizes the problems found on the site visits as ranging from minor inaccuracies to blatant misrepresentations of the waste or waste management practices in the data provided to support the delisting petitions. Serious discrepancies generally result in the petitions being either denied by EPA or withdrawn by the facility. With so few site visits, there is little to deter a petitioner from submitting inaccurate information in order to obtain a delisting and an increased likelihood that a handler of a hazardous waste will be delisted.

Congress Requires More Stringent Delisting Criteria

As discussed in chapter 2, EPA lists a specific waste or an industrial-process waste stream as hazardous if it (1) generally exhibits one or more of the characteristics of a hazardous waste or (2) contains certain constituents known to be hazardous. However, a listed waste generated by a particular facility may prove not to be hazardous if it can be shown

that the waste does not exhibit the particular characteristic or contain the hazardous constituents for which it was listed. This could occur if a facility uses different raw materials or different production processes than those typical of that industry.

Delisting is a rulemaking process in which a petitioner submits information to EPA on the facility's waste. EPA reviews the petition for consistency and completeness of data and assesses those data to make a determination whether to grant a delisting. Both granted and denied petitions go through rulemaking.

The purpose of delisting, according to EPA, is to allow handlers of a listed waste that is not actually hazardous to handle their wastes as nonhazardous. Delisting also has the potential to be an important waste minimization tool because it encourages handlers of hazardous wastes to use waste treatment technologies, such as incineration, to render their waste nonhazardous, thus avoiding costly hazardous waste regulation. For example, if a hazardous waste is incinerated and the resulting residue qualifies for a delisting, the overall amount of hazardous wastes needing RCRA-regulated disposal has been reduced. Furthermore, the cost savings of not regulating that waste as hazardous serves as an incentive for the handler to use that treatment technology.

Congress Corrects Flaws in EPA's Original Delisting Process

From 1980, when it received its first delisting petition, until 1984, EPA required delisting petitioners to demonstrate only that a waste was not hazardous on the basis of the criteria used by EPA to list it. EPA's criteria for listing a waste as hazardous required the presence of only one hazardous constituent. Because EPA's delisting regulations were based upon its listing criteria, EPA did not have to determine all the possible hazardous constituents that the waste might contain. The petitioner, therefore, was required to test its waste only for the constituents for which it was listed by EPA. The petitioner did not have to test its waste for other hazardous constituents in order to have it delisted. As a result, according to program officials, wastes containing other hazardous constituents could be delisted. For example, EPA lists wastewater treatment sludge from electroplating operations for the following hazardous constituents: cadmium, hexavalent chromium, nickel, and cyanide. However, the sludge may also contain high concentrations of toxic solvents. According to the program manager, since the sludge was not listed for toxic solvents and because EPA regulations prevented it from requesting

information on other hazardous constituents, the petitioner did not provide information on toxic solvents for consideration in the delisting decision. Thus such wastes could be delisted even though they contained toxic solvents.

EPA regulations before 1984 also allowed "temporary" delistings when it appeared likely that final delistings would be granted. Those temporary delistings, according to the delisting program manager, enabled facilities to immediately handle their wastes as nonhazardous rather than requiring the petitioners to continue to handle their wastes as hazardous while EPA completed time-consuming final rulemaking procedures. During this time, EPA issued 150 temporary delistings.¹

EPA has been aware of the flaws in its delisting program. In the 1984 RCRA amendments, the Congress—recognizing these flaws—directed EPA to consider not only the hazardous constituent for which the waste was listed, but also any other constituents or factors that EPA reasonably believes might make the waste hazardous. According to EPA officials, EPA urged the Congress to incorporate the more stringent criteria into the amendments. The amendments also required EPA to apply the new criteria to the existing temporary delistings and make final determinations of whether to grant or deny those delistings by November 8, 1986.² The statute requires that temporary delistings not made final by that date would expire, and the wastes would revert to being regulated as hazardous. In response, EPA now requires a petitioner, including each past petitioner who received a temporary delisting, to provide a comprehensive description of its production process, of the materials it uses, and of the waste itself, including all of its constituents. EPA completed its reassessment of the temporary delistings by the mandated deadline.

In applying the more stringent criteria, EPA estimates that only 33 of the 150 temporary delistings (22 percent) will receive final delistings (32 granted in final and 1 proposed). According to the program manager, 33 petitions were denied because the wastes were determined to be hazardous using the new criteria. Another 72 petitions were withdrawn and, because the petitioners did not submit the additional information

¹These include 39 informal delistings that EPA, in an effort to further speed up the process, did not publish in the Federal Register, as it did with the other temporary delistings. In July 1986 EPA reported that the Department of Justice concluded that EPA is to treat the 39 facilities as it treats the facilities with published temporary delistings for the purpose of RCRA regulation.

²EPA also granted a total of three final delistings before the 1984 RCRA amendments. They were issued just before the law took effect and, according to program officials, were assessed using the more stringent criteria.

EPA needed to complete the review, 10 have been denied and 2 proposed for denial.³ Also, in his opinion, many of the petitioners who withdrew their petitions or did not submit the additional required information did so because they knew EPA would find their wastes hazardous when it applied the new criteria.

Authorized States Delisted Prior to More Stringent Criteria

Prior to the 1984 RCRA amendments, EPA delegated delisting authority to 25 states. At least 14 states had active delisting programs, according to EPA's delisting program manager.⁴ Some of the states granted temporary and final delistings with EPA's former criteria as the standard. Like EPA's temporary delistings, the state-granted temporary delistings will expire in November 1986. But, the 1984 RCRA amendments do not address state final delistings. According to EPA, the state final delistings will remain in effect.

EPA Does Not Plan to Apply New Criteria to State Final Delistings

EPA does not plan to reassess state final delistings by applying the more stringent criteria even though it says it has the authority to do so. Moreover, the information EPA has on state delistings is incomplete and inaccurate. According to EPA, 25 states had been authorized to delist wastes. However, EPA does not know which states granted temporary and final delistings, the number of final delistings that states granted, what wastes were delisted, or what specific criteria the states used to make those determinations. An EPA contractor report identified 19 states known to have granted temporary or final delistings, based on information it compiled from existing headquarters data and telephone calls to selected states.

In an attempt to verify the information, we contacted some of the state delisting officials identified in the report and were given different information on state delisting activities. When we reported this to the contractor staff, they cautioned us against relying on the information in the report because the headquarters information they used was old. Furthermore, they could not tell us which states they contacted directly in their study and which states they did not contact but rather relied on EPA file reviews to reach their study conclusions. The EPA headquarters

³The withdrawn petitions include those from facilities that have gone out of business or that no longer handle listed wastes.

⁴The 1984 RCRA amendments effectively canceled the state-delegated programs because they required more stringent criteria for delistings and state programs must be equivalent to EPA's. States must incorporate the new delisting criteria and procedures into their regulations before they can apply to EPA for reauthorization to carry out a delisting program.

delisting program manager estimated that at least 14 states had active delisting programs because EPA had forwarded petitions received at headquarters to those states. However, the program manager did not know how many states authorized to delist received petitions directly from the handlers.

Because EPA does not know which states granted delistings, it also does not know the number of state delistings granted by the states, the wastes that were delisted, or the criteria each state used to delist. According to EPA's contractor report noted above, 11 of the 19 states that delisted granted final delistings. It also reported that seven states either did not know whether they granted final delistings, or did not know how many facilities they delisted or who received them. The contractor report also estimated that the states could have granted hundreds of final delistings. On the basis of this report and his experience in delisting, the EPA program manager responsible for delisting at the time of the contractor report estimated that states granted about 100 final delistings. In regard to the criteria used by the states to delist wastes, when we contacted program officials in six states that, according to the contractor report granted final delistings, five said they used the temporary delistings EPA published in the Federal Register before 1984 as examples and as guidance for evaluating petitions. While one of the six used additional review criteria of its own, none reportedly used criteria as stringent as now required in the law.

Although EPA guidance as early as 1980 required states to report to EPA regional offices on their delisting activities, one headquarters staff liaison with the regional offices said some regional offices have better data than others and some may have no data at all on delistings. Neither EPA nor the contractor contacted the regional offices for this information. An official of one of the six states we contacted said that the state had not been keeping its EPA regional office informed of its activities. In addition, five states could not recall receiving specific guidance instructing them to do so.

EPA has decided not to reassess the state granted final delistings. Although it has the authority to review final delistings made by the states, EPA is not required by statute to do so. According to the EPA division director responsible for delisting, the state final delistings are not a priority and it would be a waste of EPA's resources to bring state-delisted facilities back into regulation. According to an EPA associate general counsel for the division responsible for delisting, however, as a policy

EPA may want to assess state final delistings in order to assure the protection of human health and the environment from hazardous wastes. She said EPA used the contractor report discussed above as a basis for its decision not to reassess the state final delistings but was not aware that so many of the temporary delistings that EPA was reassessing were failing to meet the more stringent criteria. She noted that, for EPA to meet its policy responsibilities, it may need to assess the potential impact of allowing those state delistings to stand.

The program officials we spoke with from four of the states that reportedly granted final delistings before the 1984 RCRA amendments said either that they doubted that all the delistings they granted would still qualify for a delisting or that they did not know if they would qualify. Although EPA encourages states to review their final delistings, all six state program officials said they thought they could not reassess the earlier delistings because EPA had withdrawn their authority to delist, but would reassess if and when they were reauthorized to do so. According to the EPA official responsible for reviewing state requests for delisting authorization, states are withdrawing their reauthorization requests once they learn of the technical complexity of delisting. He therefore doubts that many states will follow through on obtaining delisting authorization. As of October 1, 1986, however, one state had been granted authority by EPA to administer its own delisting program.

EPA Efforts to Check the Accuracy of Petitions Are Limited

EPA verifies the completeness and accuracy of information received in petitions by conducting site visits, which include observing waste management practices and taking waste samples for analysis. As of September 1986, EPA had received 657 delisting petitions, including the 150 petitions leading to temporary delistings granted before November 1984. EPA has visited 37 sites and has complete sample analysis for 28. At over 70 percent of these sites (20 of 28), EPA found problems such as the wastes or waste management practices differing from those described in the petition. According to the program manager, some sites are targeted for review if EPA suspects problems with the accuracy or completeness of the petition. EPA conducts week-long trips during which it visits a targeted site and three to four randomly selected facilities. This, however, is not a statistically valid sample. Table 4.1 shows the number of facilities visited from 1982 through 1985 and the number of inaccurate petitions found as a result of these visits.

Chapter 4
Weaknesses Limit Effectiveness of EPA's
Facility Delisting Program

Table 4.1: Verification Site Visits and Results From 1982 Through 1985^a

Year	Number of sites visited	Number of sites with inaccurate petitions	Percentage of sites with inaccurate petitions
1982	1	1	100
1983	10	8	80
1984	8	5	63
1985	9	6	67
Total	28	20	71

^aEPA visited 9 facilities in 1986. However, analyses of the waste samples taken from these sites were not completed during this review.

Because of the added costs involved in handling a waste if it is designated as hazardous, it is in the interest of a facility to obtain a delisting. When a facility petitions EPA for a delisting, the handler or authorized representative from the facility signs a statement certifying that the information contained in the petition is true, accurate, and complete.⁵ According to the program manager, the types of problems EPA finds on site visits range from minor inaccuracies to blatant misrepresentations of the waste or waste management practices in the data provided to support a delisting petition. Some serious problems found included failing to disclose all hazardous wastes handled at a site or failing a characteristics test for waste handled. The serious discrepancies, according to the delisting program manager, generally result in the petitions being either denied by EPA or withdrawn by the facility. In 1985, for example, EPA visited nine facilities and identified problems at six. These problems were serious enough that none of the six petitions will be granted. Given the high percentage of site visits resulting in a finding that inaccurate or incomplete petitions had been filed, more site visits should be conducted, according to the delisting program manager. He said, however, that limited staffing prevents increasing the number. And, although EPA targeted \$500,000 in fiscal year 1986 for four week-long visits, EPA could only staff two trips.

Conclusions

EPA's delisting program is intended to provide relief to those handlers of listed wastes whose specific raw materials, processes, or other factors make their wastes nonhazardous. It can also encourage the development of waste treatment technologies if the residues resulting from such

⁵EPA defines an authorized representative as a person responsible for the overall operation of a facility or unit, such as a plant manager or superintendent, but not a consultant or other outside party.

treatment can be delisted and managed less expensively as nonhazardous wastes. Without proper controls over the delisting process, however, delisting can negate the efforts of the hazardous waste identification program discussed in chapter 2 by allowing facilities handling hazardous wastes to escape regulation.

Concerned that delisted wastes may still contain hazardous properties, the Congress in 1984 required EPA to strengthen controls over the delisting process. Specifically, it required delisting petitioners to meet more stringent criteria before their petitions could be approved. EPA is applying these more stringent criteria to new petitions and has applied them to the temporary delistings it had granted in the past, as required by the Congress. The law does not require EPA to review final petitions granted by the states, and EPA does not intend to review them, because of other priorities. State delisting authority reverted back to EPA in 1984 when the new criteria were required. Because of the more stringent criteria, EPA reports that about 22 percent of the temporary delistings it had issued will be granted final approval. It is reasonable to assume that state-granted delistings would fare no better, particularly when the states modeled their process after EPA's process. Without, at a minimum, identifying those wastes the states delisted, assessing the likelihood of such wastes to pose threats, applying the new criteria where appropriate, and taking action to revoke the delisting if necessary, EPA cannot assure protection of human health and the environment.

In gathering this information EPA may have to contact the states directly, because it is questionable whether all states complied with EPA's requirement to keep the respective regions informed about their delisting activities. As EPA implements its plans to redelegate delisting activities back to those states that adopt the new delisting criteria, its monitoring of state delisting activities will only be as successful as the data collected by its regional offices.

After receiving a delisting petition, EPA visits selected facilities to sample and analyze wastes and check the accuracy of the petitions. At over 70 percent of the sites where waste sample analyses were complete, EPA found that the petitions did not accurately describe actual conditions and at times found what it considered to be serious misrepresentation. Because of limited resources, however, less than 6 percent of the 657 petitioners' sites have been visited. While the number of sites sampled is small and may not be representative of all petitioners, it indicates that problems may exist at other sites. We therefore believe a deterrent is

essential and it would be prudent to take steps to ensure that information being submitted on delisting petitions is accurate and complete. Focusing on only those facilities whose petitions otherwise meet EPA review requirements for delisting would be efficient use of resources.

Recommendations

We recommend that the Administrator, EPA

- determine which wastes have been granted final delistings by states and what criteria were applied to those delistings; assess the potential environmental or health impact of those delistings; and, where appropriate, initiate action to apply the new delisting criteria;
- ensure that (1) future state-delegated delisting activities are monitored and that information is collected that will allow EPA to identify facilities and wastes delisted and (2) the review criteria applied are at least as stringent as that set by EPA and that they are applied consistently; and
- increase the number of site visits or implement other controls to ensure that EPA has complete and accurate information when evaluating delisting petitions.

EPA Lacks Current Nationwide Information on Hazardous Waste Production and Management

For those wastes that EPA has identified as hazardous, it has been unable to provide the Congress with current, reliable information on the amounts and types of hazardous wastes being generated, treated, stored, and disposed of nationwide. As early as 1976, the Congress required EPA to establish reporting requirements for hazardous waste generators and treatment, storage, and disposal facilities and later required biennial reports. Congressional committees that considered this legislation expected EPA to compile national information on hazardous wastes and have it available for the Congress. EPA attempted to produce a national report on hazardous wastes in 1983, but the poor quality of the data received precluded the possibility of doing so. In June 1986 EPA initiated several actions to improve the quality of the information it collects. But because hazardous waste handlers had already submitted their data on 1985 hazardous wastes and states were compiling the data, EPA does not expect to have complete, reliable national information until the report on 1987 hazardous wastes, which would likely be issued in early 1989. Without current, accurate information on the amounts and types of hazardous wastes generated and the treatment, storage, and disposal methods used over the years, the Congress and EPA cannot readily assess the impact of hazardous waste regulations, evaluate trends in waste management practices, or develop waste management priorities.

Congress Requires Hazardous Waste Reporting

Concerned about the lack of information on the amounts and locations of hazardous waste generation and the ultimate disposal of such wastes, in 1976 the Congress required that EPA promulgate regulations establishing hazardous waste reporting requirements. These regulations were to require generators of hazardous wastes and owners or operators of hazardous waste treatment, storage, and disposal facilities to submit periodic reports to EPA, or to the states authorized to carry out the RCRA program, on the quantities and types of hazardous wastes generated and the treatment, storage, or disposal of those wastes for a time period to be determined by EPA.

In early 1980 EPA promulgated regulations establishing annual reporting requirements for generators as well as treatment, storage, and disposal facilities, which allowed for enforcement actions against those who reported false information or those who did not report. The first year for which data were required to be submitted was calendar year 1981. In late 1982, EPA published a notice of proposed rulemaking requesting comments on EPA's intention to replace the annual report with a biennial sample survey. However, most of those commenting believed the sample survey would increase the reporting burden on the handlers. Because of

these and other concerns, EPA in January 1983 issued a final rule dropping the sample survey and requiring the current biennial report, the first of which would cover calendar year 1983 activities. Because EPA was in the process of evaluating the data collected through a survey and submission of 1981 annual reports, it eliminated the requirement to submit the 1982 report.

According to the project manager for the 1983 biennial report, EPA did not compile the 1981 annual report data because its evaluation indicated that compliance with the reporting requirement was extremely low. It did, however, publish the results of its national sample survey on hazardous waste activities during 1981.¹ EPA estimated that 291 million tons of hazardous waste was generated. However, because of statistical uncertainty associated with sampling, the total could be anywhere from 146 million to 436 million tons. Nonetheless, it was EPA's first and only description of hazardous waste generation and management activities regulated under federal law since enactment of RCRA in 1976.

Basically EPA's regulations require that generators report the types and quantities of hazardous wastes generated during the calendar year and the treatment, storage, or disposal facility to which the wastes were shipped. Treatment, storage, and disposal facilities must report the types and quantities of hazardous wastes handled, the facility from which the wastes were received, and the treatment, storage, or disposal methods used. In states that are not authorized to carry out the RCRA program, handlers are to report to EPA on standardized forms by March 1 of each even-numbered year. In states that are authorized, generators and handlers are to report to the states on state-required forms by the same deadline. The authorized states are in turn required to compile and submit the state biennial reports in EPA format to EPA by September 30.

In 1984 the Congress required that the information be reported at least biennially and also include efforts undertaken to reduce the volume and toxicity of wastes generated and the actual changes achieved in comparison with previous years. Congressional committees that considered this legislation expected EPA to compile national information on hazardous wastes and have it available for the Congress. A Senate committee in 1983 proposed that EPA prepare a biennial report to the Congress and the President on hazardous waste generation, treatment, storage, and

¹National Survey of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated Under RCRA in 1981, Apr. 1984.

disposal nationwide, starting with the 1983 reporting year. The proposal was dropped in a conference committee because the committee believed that EPA had already begun to compile the data requested and it would be available to the Congress. The committee report stated that EPA is expected to continue to compile national hazardous waste data and to seek more accurate data than has been available in the past.

No Biennial Report Issued on 1983 Hazardous Wastes

EPA attempted to compile a nationwide report on 1983-reported data, the first data reported under the biennial handler-reporting requirement. According to the project manager responsible for the report, EPA hired two contractors to help at a total cost of over \$140,000 and spent over 1 year trying to compile individual handler and state summary reports. When the information was aggregated into national figures, however, EPA found that the amount of hazardous waste was about one-third less than the 1981 estimate, and the number of facilities generating hazardous waste was three times greater. EPA considered such a reduction unlikely with a tripling of generators. Because of this and the problems identified below, EPA decided not to issue the report.

According to the EPA project manager, the data collected were not reliable. He cited examples of inaccurate and incomplete data submissions. For example, some states double counted the amounts of hazardous wastes in reporting their final disposition figures. Rather than counting the quantity of a waste only in its final process in 1983, such as a treatment or land disposal, they counted the quantity of waste that was treated and then counted it again if it was later disposed of on land, getting a total disposition figure that could be twice the actual amount. Other states did not complete some sections of the report because they did not collect the data EPA requested. One state submitted what appeared to be the entire list of facilities it contacted initially to determine which, in fact, handled hazardous wastes. Other states did not differentiate their state-regulated wastes from RCRA-regulated wastes. In addition, two did not submit reports.

A lack of commitment at federal and state levels to produce the biennial report and the lack of a standardized form for all generators and treatment, storage, and disposal facilities were the primary causes of the poor data, according to several EPA officials. The project manager stated that, because EPA did not emphasize the importance of the biennial report, the states did not treat it as important. Also, because authorized states may use their own state forms to collect data from the handlers,

the states did not always get all the necessary data or were not able to easily transfer their data to EPA's state summary format.

The project manager of the 1985 biennial report identified additional causes for the poor 1983 data. He cited problems with the information that EPA is requesting. These problems occur primarily in EPA's handler reporting form but are also reflected in the information EPA requests in the state summary format. For example, EPA cannot get a clear picture of the hazardous waste treatment and disposal processes used because it requires the reporting of only the final disposition of a waste in a given year. In addition, it is not clear in EPA's regulations who should report. If generators do not generate hazardous wastes in a given year, they do not have to report. But, to get an accurate count, EPA needs to know if the handler no longer handles, or temporarily does not handle, hazardous waste, as opposed to the handler's failing to report. The other cause of the poor data, according to this program manager, is that EPA did not verify the information submitted by generators and treatment, storage, or disposal facilities. In addition, although EPA estimated that 10 to 20 percent of the treatment, storage, and disposal facilities did not report as required, it took no enforcement action against the facilities because neither the information submitted nor the data base EPA used to determine nonreporting was considered reliable.

EPA Is Taking Corrective Action to Improve Biennial Reporting

Although EPA initiated several corrective actions in June 1986 to improve the data in upcoming biennial reports, these actions may have little impact on the 1985 national report. The generators and treatment, storage, and disposal facilities were to report their 1985 hazardous waste data by March 1, 1986, and the states to compile their data for submission to EPA by October 30, 1986.² However, EPA expects to be able to produce a reliable report on 1987 hazardous wastes.

During 1985, before handlers reported their biennial information and at a time when changes could have been made to improve the 1985 data, EPA took few actions to correct the problems. EPA provided instructions, EPA handler forms, and a computer program for entering data from EPA's handler forms for approximately 20 states using the forms. However, EPA did not distribute the program that would generate the state summary reports from these forms until October 30, 1986. EPA also targeted

²EPA delayed the date from September 30, 1986, because it requested additional information from the states and because its computer program to assist the states in compiling their data was not expected to be completed until the end of September.

assistance to two states whose 1983 information presented major problems for EPA. The actions, however, did not address all of the causes EPA identified for the problems; i.e., EPA did not emphasize the importance of the biennial report to the states or require a standardized reporting format to get better data.

For the states that may collect data on their own handler forms, EPA did not provide written guidance or instructions until after the June 1986 reorganization of the office responsible for biennial reporting. This was well after the March 1 date by which the states were to have collected the needed data from their hazardous waste handlers. In guidance to the states and regional offices in their RCRA activities, EPA indicated that the state biennial reports were to be completed by September 1986 and that separate guidance would be issued on the form and content of the reports. According to the project manager of the 1983 biennial report, he drafted a memorandum to the regions in late February 1986 on the information to be collected and the importance of the report. However, it was not signed by the director of the Office of Solid Waste because of another unrelated RCRA information management priority directed at the regions at that time. In place of the memorandum, the project manager said, he gave verbal instructions to the regions to direct the states to use the 1983 reporting format again this year.

Under a reorganization within the Office of Solid Waste in June 1986, responsibility for the biennial report and other information activities was transferred to the information management staff within the newly created Office of Policy, Planning, and Information. The director of the Office of Solid Waste required this new office to perform an extensive review of the biennial reporting system to identify and correct problems with the previous report. She considers the development of reliable information to support the hazardous waste program one of her highest priorities and the biennial reporting system a vehicle for collecting that information. Accordingly, she sent a memorandum to the regions in July 1986 emphasizing the importance of the biennial report and requesting additional information from the states, which would provide more specific information on the handlers and help EPA evaluate compliance with the reporting requirement. In addition, EPA is further emphasizing the importance of the report by targeting \$425,000 in contracts for the end of fiscal year 1986 to clarify the problems and make improvements.

Among the actions EPA is taking to improve the biennial report is a national sample survey of 1985 handler report submissions, which is to be completed by the end of 1986 or early 1987. Among other things, the

sample survey will allow EPA to compare the results of the 1985 national biennial report on all handlers with the survey results. If the biennial report figures are too far off those of the survey, EPA may decide not to issue the biennial report but will be able to provide some information on 1985 hazardous wastes from the national survey.³ In addition, EPA is going to prepare 1985 biennial reports for the states in two regions in which EPA had conducted a previous hazardous waste information project on 1983 data. Finally, to get a clearer picture of the number of hazardous waste handlers and those that are not reporting as required, EPA is requiring states to account for all handlers that did not report their hazardous waste activities in 1985.

Most of EPA's efforts are being directed at improvements in the information EPA is collecting. However, because of the lateness of those actions, they are directed more at the 1987 report activities. To address the lack of a standardized reporting form, EPA's national sample survey, mentioned above, will also be looking at the different information needs and handler reporting forms of the states in order to revise EPA's handler reporting form and state summary reporting format for 1987. EPA believes that by improving its form and format it can meet the information needs of the states and will not have to require a national reporting form for all hazardous waste handlers. For example, some states may voluntarily switch to EPA's revised handler form if it meets their needs, while other states that continue to use their state handler forms may find it easier to transfer their information to EPA's revised summary format. According to the 1985 project manager, EPA will not initiate action at this time to require a standardized national handler form. He said that, not only would implementing the use of the form involve lengthy rulemaking, but also EPA is only now in the process of developing an appropriate form.

Other revisions to the form and format are also geared to obtaining better information. For example, as mentioned previously, the information EPA requests does not show the different processes that the wastes go through because it asks only for final disposition. The work EPA is conducting in two regions will also provide information on waste flow—what treatment processes the wastes go through and where they end up—which will help EPA revise the information it requests for 1987. In

³Independent of the biennial report, EPA is also conducting a survey of hazardous waste treatment, storage, disposal, and recycling facilities to gather information it will need as a result of the 1984 RCRA amendments. From an initial screening questionnaire, EPA expects to publish preliminary information on 1985 hazardous waste management in January 1987 but does not expect to have waste-specific information until 1988, when it completes the final phase of its survey.

the meantime, however, the project manager is recommending that EPA not report the waste management practices of 1985 hazardous wastes because, as currently collected, the information would be misleading for policy considerations.

To address the issue of obtaining complete and accurate data for the biennial report, EPA is planning to enforce the reporting requirements. According to the project manager, EPA plans to take enforcement action against hazardous waste handlers that did not report their 1983 or 1985 activities, as required. EPA has identified cases of nonreporting in 1983 and will be using the 1985 biennial reports to identify 1985 nonreporters. EPA plans to begin enforcement actions during fiscal year 1987 in order to show that it is serious about the biennial report and that handlers have to report. In addition, according to the 1985 project manager, EPA also plans to incorporate, as part of routine RCRA inspections of hazardous waste facilities, a check on the accuracy of the biennial report information submitted by handlers. EPA plans to take enforcement action against any handlers who submit inaccurate or false information. Although EPA is taking action to verify the quality of the handler information, it plans to keep the verification at the state level as much as possible.

Once EPA has revised its information needs and the reporting form and format, it plans to begin conducting training on how to fill out and process the reporting forms. The program manager said he recognizes the need for training, but it was too late to conduct any for the 1985 report. He expects to provide training for the 1987 reporting year through regional office and trade association workshops.

As a result of these corrective actions, the project manager expects to have reliable information on 1987 hazardous wastes, which would probably be released in early 1989. If the data that EPA collects on 1987 hazardous wastes are not reliable, the project manager will propose that EPA require a standardized handler reporting form and centralized processing of the information by EPA for 1989 hazardous wastes.

Lack of National Information Hampers Decision-Making Processes

Without national information on the types and amounts of hazardous wastes produced and the ways in which the wastes are managed and disposed, the Congress and EPA are hampered in their decision making in this area. The Congress does not have accurate, reliable information on which to make hazardous waste policy or regulatory decisions or to assess the impact of previous legislation. According to a 1983 Senate

committee report, biennial report information is necessary to identify trends in hazardous waste management practices, establish resource needs and priorities, and assist in evaluating the impact of hazardous waste regulations.

In addition, EPA cannot properly manage its hazardous waste program without such information. According to the project manager for the 1985 report, the intent of the biennial report is to provide EPA with an accurate picture of the regulated community. For example, EPA needs the biennial report information to conduct regulatory impact assessments for rulemaking and to assess risks and benefits of proposed regulations. In addition, it needs periodic reliable information to conduct trend analyses, such as progress in waste minimization and movement from land disposal. It also needs such information to set permitting and inspection priorities based on what is reported.

Both public and private interest groups are concerned about the lack of information. According to the associate director for solid waste programs of the Chemical Manufacturers Association, uncertainty about the quantities of hazardous waste feeds fears and may be an impetus to regulation. According to a staff scientist for the Environmental Defense Fund, such basic information is fundamental to any program. Without it, the impact of recent regulations, such as the regulation of small quantity generators, will not be known.

Conclusions

EPA has not provided the Congress with current, reliable information on hazardous waste generation and treatment, storage, or disposal nationwide, although it has been collecting data since 1981. EPA was not able to produce a reliable national report on 1981 annual or 1983 biennial hazardous waste data because of the poor reporting compliance or poor quality of the data received. In addition, it is unlikely to have complete, reliable data to report on 1985 hazardous wastes because of lateness of corrective actions aimed at improving the situation. Such actions may significantly improve 1987 data, but this is more than a decade after the Congress mandated hazardous waste reporting requirements under RCRA.

EPA's actions to correct problems with the biennial reporting process include a sample survey of 1985 handler reports that will provide some back-up information on 1985 hazardous wastes if the national biennial report figures are found to be inaccurate. EPA now considers the biennial report a high priority and is focusing on identifying and correcting past

problems. In addition, EPA is addressing the issue of reporting compliance and the quality of information being reported by the generators and treatment, storage, and disposal facilities. EPA expects these actions to result in a reliable national biennial report on 1987 hazardous wastes (to be issued in 1989). In the meantime, however, the Congress and EPA must continue to make decisions about the hazardous waste programs with questionable, outdated estimates of hazardous waste production and management. At the same time, EPA falls further behind in establishing a reliable benchmark estimate against which to measure trends in treatment and disposal or increases or reductions in hazardous waste generation.

Because EPA's corrective actions on the biennial report were taken so late in our review, we did not conduct a detailed analysis of them. In addition, the results of some of the initiatives will not be known until 1987 or later. Consequently, it is too early to tell how effective EPA's actions will be in remedying the problem of the national biennial report. We therefore have no recommendation at this time.

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