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Report to Congressional Requesters

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SUPERFUND

EPA Could Further Ensure the Safe Operation of On-Site Incinerators

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Resources, Community, and
Economic Development Division

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The Honorable Jerry Lewis
Chairman
The Honorable Louis Stokes
Ranking Minority Member
Subcommittee on VA, HUD,
and Independent Agencies
Committee on Appropriations
House of Representatives

The Honorable James M. Talent
The Honorable Barney Frank
House of Representatives

The Environmental Protection Agency (EPA) has used incineration—that is, controlled, high-temperature burning—to clean up some of the most toxic forms of contamination at the nation's most severely contaminated hazardous waste sites, known as Superfund sites. However, local community groups, concerned that incinerators could emit hazardous substances, have often protested the choice of incineration as a cleanup remedy. EPA is responsible for ensuring that incinerators used at these sites burn hazardous waste in a manner that protects human health and the environment.

Because of the public's concerns about the use of incineration at Superfund sites, you asked us to examine (1) what safeguards EPA uses to promote the safe operation of incinerators at these sites and (2) whether EPA has fully implemented its planned system of safeguards.

Results in Brief

EPA relies upon four main methods to promote the safe operation of incinerators used at Superfund sites. These methods are (1) required site-specific standards for an incinerator's emissions and performance, (2) engineering safety features built into the incinerator's systems, (3) air monitoring to measure the incinerator's emissions, and (4) on-site observation of the incinerator's operations. EPA sets standards, such as minimum contaminant destruction levels and maximum emission levels, after it studies each site's characteristics (e.g., the type and concentration of contamination present). In addition, each incinerator is designed with safety features intended to stop its operation if it fails to meet the specified operating conditions. Air monitors are placed in the incinerator's

stack and around the site's perimeter to measure the incinerator's emissions. Furthermore, at the three Superfund sites with ongoing incineration projects at the time of our review, EPA had arranged for 24-hour, on-site oversight from either the U.S. Army Corps of Engineers or a state government to ensure that the incinerator was operating properly.

In addition to the four methods discussed above, EPA managers intended to use two other techniques—inspections and applications of lessons learned—to encourage safe operations, but neither was fully implemented. First, EPA has not used inspectors from its hazardous waste incinerator[1] inspection program to evaluate the operations of all Superfund incinerators as it required in a 1991 directive. Only one of the three incinerators we visited had received such an inspection. That incinerator had received two inspections, but one was conducted when the incinerator was shut down for maintenance. EPA regional staff responsible for hazardous waste incinerator inspections were unaware that the Superfund incinerators were supposed to be inspected; and EPA headquarters officials were unaware that the inspections were not occurring. Second, EPA managers did not follow through on their intention to systematically apply the lessons learned from incineration at one site to other sites. They had intended to prepare documents describing problems and solutions at each incineration project for use in designing and operating other projects and to hold periodic conference calls with the managers from incineration sites to discuss issues of common interest. Both of these methods of transferring information were dropped for various reasons, including the demands of higher priorities. We found that the lessons learned from the problems experienced at the sites we visited, such as how to prepare for storm-related power outages, could benefit other sites. EPA headquarters officials told us that they encouraged Superfund project managers to share their experiences with incineration but had not facilitated this exchange in a structured way.

Background

With the enactment of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980, the Congress created the Superfund program to clean up the nation's most severely contaminated hazardous waste sites. The Congress extended the program in 1986 and 1990 and is now considering another reauthorization. Under CERCLA, EPA investigates contaminated areas and places the most highly contaminated

[1]Hazardous waste incinerators include commercial facilities in business to burn hazardous waste from various industrial and other sources as well as private facilities that industries use to destroy their own waste.

sites on the National Priorities List (NPL) for study and cleanup. As of December 1996, there were 1,210 sites on the NPL.

After a site is placed on the NPL, EPA extensively studies and evaluates the site to determine the appropriate cleanup remedy for it. The remedy selected depends upon the site's characteristics, such as the types and levels of contamination, the risks posed to human health and the environment, and the applicable cleanup standards. The site's cleanup can be conducted by EPA or the party responsible for the contamination, with oversight by EPA or the state.

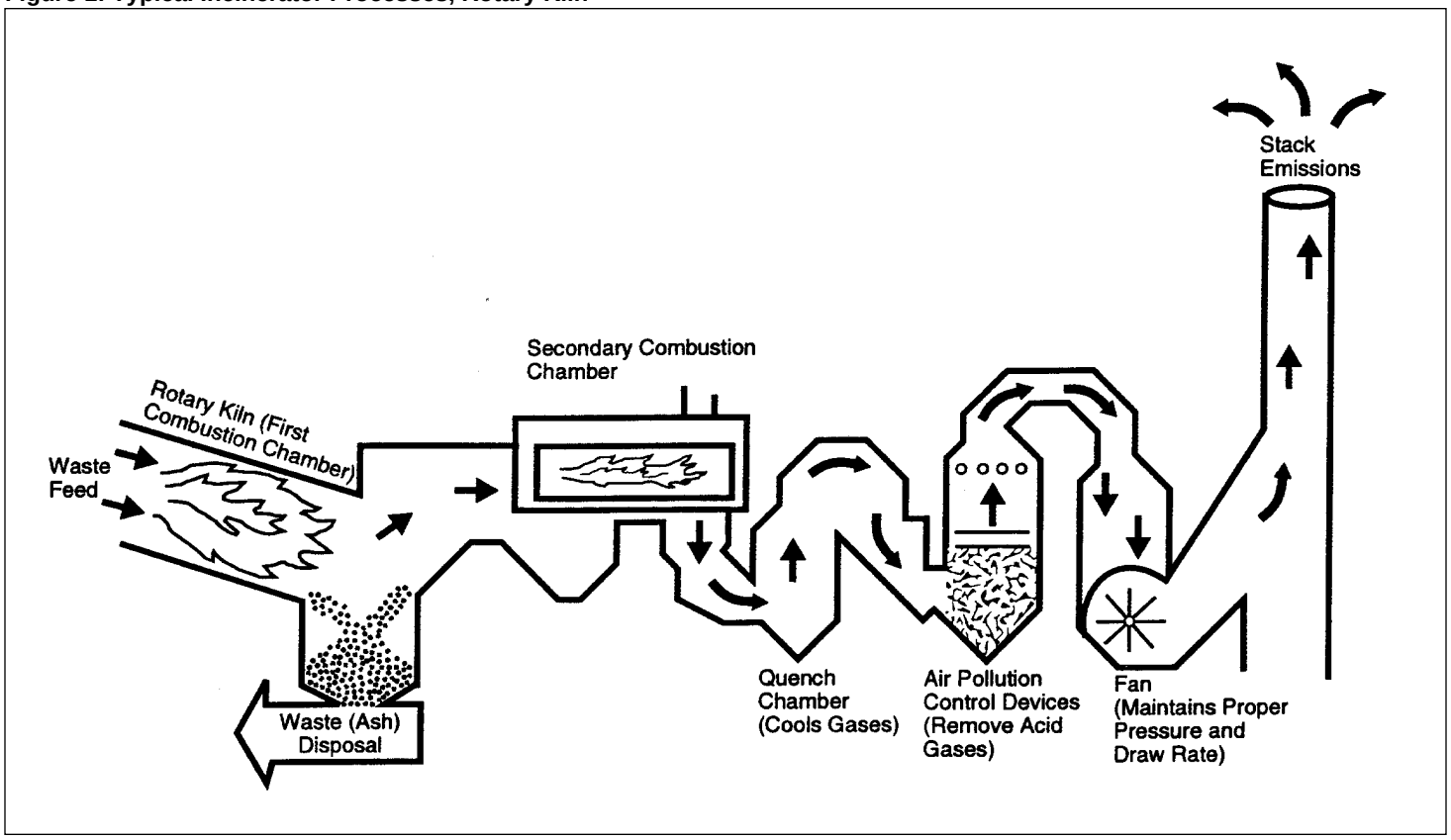
Through fiscal year 1995, the latest period for which EPA has data, EPA had selected incineration as a Superfund cleanup remedy 43 times, or in about 6 percent of the decisions on remedies it had reached through that date.[2] At the time of our review, three incinerators were operating at Superfund sites—the Bayou Bonfouca site in Louisiana, the Times Beach site in Missouri, and the Baird and McGuire site in Massachusetts.[3] As of October 1996, EPA planned to use incineration at four additional sites.

Incineration is the burning of substances by a controlled flame in an enclosed area that is referred to as a kiln. Incineration involves four basic steps: (1) wastes, such as contaminated soil, are prepared and fed into the incinerator; (2) the wastes are burned, converting contamination into residual products in the form of ash and gases; (3) the ash is collected, cooled, and removed from the incinerator; and, (4) the gases are cooled, remaining contaminants are filtered out, and the cleaned gases are released to the atmosphere through the incinerator's stack. (See fig. 1.)

[2]EPA derived the number of instances in which incineration was selected as a remedy from an analysis of the remedy decision documents for each Superfund site. The decision documents contain information only on the initial remedy chosen and do not reflect later changes. Consequently, the actual use of incineration at Superfund sites probably falls somewhat short of the 43 instances indicated by the documents.

[3]During fiscal year 1995, EPA selected remedies for 110 sites.

Figure 1: Typical Incinerator Processes, Rotary Kiln



Source: EPA.

Incinerators may be fixed facilities that accept waste from a variety of sources, or they may be transportable or mobile systems. Fixed facility hazardous waste incinerators are required by the Resource Conservation and Recovery Act of 1976 (RCRA) to obtain an operating permit from EPA. RCRA regulates all facets of the generation, transportation, treatment, storage, and disposal of hazardous wastes in the United States. RCRA requires that fixed facility hazardous waste incinerators be operated according to EPA's regulations and be inspected by EPA every 2 years.

Incinerators used to clean Superfund sites are generally "transportable," that is, they are transported to the site in pieces, assembled, and removed when the cleanup is complete. These incinerators are constructed and

operated by contractors. CERCLA exempts any portion of a cleanup action conducted entirely on-site, including incineration, from the need to obtain any permit. However, CERCLA requires EPA to apply legally applicable or relevant and appropriate environmental standards from other federal laws, including RCRA, to Superfund cleanups. Accordingly, EPA requires incinerators at Superfund sites to meet RCRA's substantive requirements, such as the act's standards for emissions.

EPA Relies Upon a Variety of Methods to Promote the Safe Operation of Superfund Incinerators

EPA relies on four principal methods to ensure the safe operation of incinerators used to clean up Superfund sites. These methods are (1) setting site-specific standards for emissions and operations, (2) incorporating safety features into an incinerator's emergency systems, (3) monitoring emissions at the incinerator's stack and along the site's perimeter, and (4) providing 24-hour on-site oversight. (See app. I for more details on the safeguards at the three incinerators in operation at the time of our review.)

Incinerator's Operating Conditions Are Set on a Site-Specific Basis

EPA establishes specific cleanup standards for each incinerator used at a Superfund site. These standards are based on studies of the site's characteristics (e.g., the type and concentration of contamination present) conducted during the incinerator's design and construction. Standards can be adopted from other environmental programs or laws, such as RCRA or the Toxic Substances Control Act.[4] Typically, RCRA's standards for fixed facility hazardous waste incinerators are applied. RCRA's standards govern the extent to which an incinerator must destroy and remove contaminants and set limits on emissions from the incinerator.

EPA establishes the operating parameters needed for the incinerator to achieve the emissions standards and tests the parameters through a "trial burn" required under RCRA. The operating parameters can include the temperature of the kiln, the minimum oxygen levels needed to break down contaminants in the kiln, and the maximum carbon monoxide levels that may be produced. Although not required by EPA's regulations, a trial burn plan was reviewed by a RCRA expert at all the sites we visited to determine whether the proper operating conditions were being tested. According to EPA officials, if the incinerator operates within the parameters established at the trial burn, the incinerator will be operating safely.

[4]EPA has issued regulations governing the incineration of polychlorinated biphenyls under the Toxic Substances Control Act.

Incinerators Include Built-In Safety Measures

Besides establishing standards for emissions and operations, EPA requires engineering controls to prevent the standards from being exceeded. In addition, incinerators at the three sites we visited had built-in safety features unique to each model to prevent excessive emissions of contaminants in the event of an emergency shutdown.

RCRA's regulations, which EPA applies at Superfund sites, require that incinerators have devices, called automatic waste feed cutoffs, that will stop contaminated waste from being fed into an incinerator when the operating conditions deviate from the required operating parameters. The waste feed would be cut off, for example, when a change in pressure or a drop in temperature occurred that could compromise the kiln's effective incineration of the contaminants. These cutoffs are set with a "cushion" so that the waste feed shuts down before the incinerator operates outside the established parameters. The number and type of waste feed cutoffs will depend on the requirements for each site. According to EPA officials, some cutoffs are routine, to be expected during the normal course of an incinerator's operations, and a sign that the safety mechanisms are working properly. For example, cutoffs can be triggered by expected changes in pressure within the kiln brought on by variations in the waste input stream. However, other cutoffs, especially repeated cutoffs, can be signs of problems.

At the three sites we visited, all of the incinerators had some additional safety measures, not required by regulation, in the event that a critical part of the incinerator failed. At the Times Beach and the Bayou Bonfouca sites, the incinerators have emergency systems that fully shut down the incinerator and decontaminate the gases remaining in the system at the time of the shutdown. These systems seal off the gases and expose them to a high-temperature flame to destroy any residual contamination. At the Baird and McGuire site, the emergency system ensures that metals and particulates are removed before gases are emitted from the kiln. The most common reason for activating the emergency systems at the three sites was a shutdown caused by a power outage.

EPA Monitors Air to Detect Any Release of Contaminants

EPA continuously monitors the air in the vicinity of an incinerator to ensure that emissions from the stack and from areas where soil is being excavated before being put into the incinerator do not exceed the maximum permitted levels. Air monitoring at the sites involves measuring conditions in real time and performing detailed laboratory analyses of samples that are collected over a longer period of time. For example, at

the Baird and McGuire site, stack emissions are monitored continuously to measure key indicators of combustion, such as the oxygen levels in exhaust gases, to ensure that the incinerator is operating properly. For organic contamination,[5] a more detailed laboratory analysis is carried out during the trial burn to provide additional assurance that dioxin, a cancer-causing substance produced by the burning of organic substances, is not excessively emitted. The Baird and McGuire site also has nine air monitors at its perimeter, each of which is hooked up to alarms that sound if emission levels approach the established parameters. These monitors, which are intended primarily to detect possible emissions from the on-site excavation of contaminated soil, monitor and record data every minute. According to the incineration contractor's project manager at the Baird and McGuire site, the air monitors picked up elevated levels only once during an excavation, when a drum of chemicals was removed. In a situation such as this, the excavation is slowed to bring emissions down to required levels. According to EPA's reports for the three sites we visited, emissions from the incinerators' stacks never exceeded the permitted levels.

On-Site Observation of Incinerators' Operations Occurred

Although 24-hour oversight is not required by regulations or formal EPA policy, Corps of Engineers or state officials continuously observed the operations of the incinerator at each of the sites we visited. For the two cleanups that EPA managed (at the Baird and McGuire and Bayou Bonfouca sites), EPA had contracted with the U.S. Army Corps of Engineers for on-site oversight, while at Times Beach, where a responsible party was conducting the cleanup, a Missouri state agency provided oversight. At the time of our visit, these sites had staff to cover operations 24 hours a day.[6] For example, at Baird and McGuire, 12 Corps of Engineers staff were assigned to monitor the incinerator's operations.

On-site observation involves visual inspections and record reviews to ensure that the incineration companies are meeting the operating conditions specified by EPA. At the sites we visited, Corps of Engineers or state officials were responsible for checking the operating parameters displayed on computer screens in the incineration control rooms and inspecting measurement devices on incineration equipment to verify that they were working properly. For example, at Times Beach, a state official monitored operations from an on-site computer screen, while a state RCRA employee obtained the computerized information from his office in the

[5]Organic compounds are composed of carbon, hydrogen, and sometimes other elements.

[6]In July 1996, the state agency cut back on-site oversight to about 12 hours per day at Times Beach.

state capitol to ensure that the conditions of the state's RCRA permit were being met.[7] At Bayou Bonfouca, Corps officials examined operation log books and talked to incinerator operators to look for any problems and oversaw the procedures for testing and sampling emissions from the incinerator. The officials were also responsible for reviewing the air-monitoring reports and operation summary reports required of the incineration company and reporting their findings to EPA.

EPA Has Not Implemented Two Planned Methods for Promoting the Safe Operation of Incinerators

In addition to the safeguards discussed above, EPA planned two additional methods to promote the safe operation of Superfund incinerators but never fully implemented them. First, EPA issued a directive requiring inspectors from its hazardous waste incinerator inspection program to periodically evaluate Superfund incinerators. This requirement had not been followed at two of the three incinerators operating at the time of our review. Second, EPA has not carried out its intention to systematically ensure that the lessons learned about an incinerator's operations in one incineration project are applied to subsequent projects. EPA is relying upon informal communication to transfer "best practices" from one incineration project to the next.

EPA Has Not Implemented Its Policies for Inspecting Incinerators

In 1991, EPA issued a directive requiring that the same type of inspections that are conducted at RCRA-permitted hazardous waste incinerators be conducted at Superfund incinerators. In 1993, EPA issued interim guidance on how to perform these inspections at Superfund incinerators. This guidance required that inspectors in EPA's regional offices review the operating records for Superfund incinerators and examine the units to ensure that they were operating within their established parameters. Only one of the three incinerators we visited had received such an inspection. That incinerator received two inspections, one of which was conducted while the incinerator was shut down for maintenance. EPA regional staff we talked to were unaware of the directive and guidance on these inspections. EPA headquarters personnel told us that they were unaware that the inspections were not taking place but confirmed with the regions that only one region was inspecting Superfund incinerators. EPA officials attributed the lack of inspections to the higher priority given to other enforcement demands and a reorganization of enforcement functions, which muddied the responsibility for inspecting the incinerators.

[7]This is the only Superfund site that has a RCRA permit, which specifies specific operating conditions. (See app. I for further information.)

Headquarters officials said they would encourage the regions to do the inspections in the future.

According to officials from EPA's Office of Enforcement and Compliance Assurance (OECA), who are responsible for implementing the inspection program, RCRA incinerator inspectors had visited Superfund incinerators when the guidance was first issued in 1993. However, these inspectors said their inspections were hampered because they did not have a site-specific document containing the requirements for each incinerator's operations that they could use to evaluate these operations. At Superfund sites where transportable incinerators are used, EPA may specify standards, operating parameters, emergency controls, and requirements for air monitoring and on-site oversight in various documents, such as a contract with the operator of the incinerator, a court-approved consent decree with the responsible party, or a work plan for the site. In contrast, fixed facility hazardous waste incinerators require a RCRA permit, which documents the conditions under which an incinerator must operate. Inspectors use the conditions specified in the permit as criteria for evaluating the incinerator's operations. For Superfund incinerators, however, an operating permit is not required. The 1993 interim guidance for inspecting Superfund incinerators recognized the need for a single document specifying site-specific operating requirements and procedures and stated that such a document would be developed. However, no such document was developed because, according to EPA officials, other priorities intervened. EPA officials attributed the lack of recent Superfund incinerator inspections, in part, to the lack of a consolidated list of requirements.

The Superfund, RCRA, and OECA officials we interviewed on this question agreed that Superfund incinerators should be inspected. They stated that experienced RCRA hazardous waste incinerator inspectors in EPA's regional offices have knowledge and experience that makes them well qualified to evaluate the operations of Superfund incinerators. These officials believed that an inspection by an outside, independent inspector was important even if an incinerator had on-site oversight. RCRA officials told us that at the few RCRA-permitted hazardous waste incinerators with on-site inspectors, the inspectors are rotated every 6 months in order to maintain their independence and objectivity. In addition, they said that experienced incinerator inspectors would have more expertise than the Corps of Engineers or state staff assigned to oversee the incinerators' operations. Although these staff do receive training, they are generally not experts on incineration.

EPA Does Not Have a Formal Mechanism for Sharing Best Practices

Because EPA site managers may work on as few as one or two projects at a time and because incineration is not a common remedy at Superfund sites, managers may have limited experience with incineration. However, EPA does not have any formal mechanism to share the lessons learned about an incinerator's operations. The need for information-sharing is illustrated by experiences at two sites we visited. The Bayou Bonfouca site had a policy to stop feeding waste to the incinerator during severe storms. This policy was adopted to reassure the public that the incinerator would not suffer an emergency shutdown during a storm-related power outage. The Times Beach site, which was using the same incinerator model, did not formally adopt this policy until after a severe storm had knocked out the power at that incinerator, causing an emergency shutdown. The storm and power outage caused the emergency emissions system and the perimeter air monitors to fail. (See app. I for details.) The lessons learned from these problems could be applied to future incineration projects to prevent similar problems from arising. However, EPA has no formal mechanism to ensure that other incineration projects can benefit from the Times Beach experience.

EPA officials agreed that they should be sharing the lessons learned from each site. According to officials, they had intended to do so by issuing fact sheets, but the effort was dropped before any fact sheets were issued. The officials stated that the fact sheets were not issued because of a fear that information on problems with incinerators' operations could be used against them in litigation. In addition, they attempted to have monthly conference calls with all of the managers of incineration sites, but the effort soon faded away. However, EPA officials told us that they do informally share lessons learned through discussions with regional staff responsible for incineration sites. Also, they encourage site managers to visit other incineration sites to learn from the experiences there; however, they do not currently intend to revive their plans for preparing fact sheets.

Conclusions

EPA employs a number of techniques to encourage the safe operation of Superfund incinerators. These techniques include mechanical features, such as air monitors, as well as operational procedures, such as 24-hour independent oversight. However, residents of the areas surrounding incinerators frequently desire an extra degree of assurance that the incinerators are operating safely. EPA has not followed through on other opportunities to improve its oversight of incinerators and thereby provide additional assurance to the public. First, EPA has not followed its own policy of having RCRA hazardous waste incinerator inspectors inspect

Superfund incinerators. Although these inspections would provide the public with independent evaluations of the incinerators' compliance, they did not take place, in part, because consolidated lists were not made available to inspectors of the standards, design requirements, and operating rules for each site where incineration is used. Inspectors could use such lists, just as they use the operating permits for fixed facility hazardous waste incinerators, as an aid in evaluating compliance. Second, EPA's attempts to systematically share the lessons learned from site to site were never fully implemented. Because incinerators are being used at relatively few Superfund sites, EPA project managers may have little or no experience with them. These managers would benefit from the experiences of other managers of sites where incinerators have been used. At the sites we visited, operational problems occurred that might be avoided at other incineration projects if the knowledge gained was preserved and shared.

Recommendations to the Administrator, EPA

To provide further assurance that incinerators at Superfund sites are being operated safely, we recommend that the Administrator, EPA,

- implement the agency's guidance for having RCRA hazardous waste incinerator inspectors evaluate Superfund incinerators, including the development of a single document specifying site-specific operating requirements and procedures for these incinerators, and
- document the lessons learned about safe operation from the experiences of each Superfund site where incineration is used and institute a systematic process to share this information at other sites where incinerators are used.

Agency Comments

We provided copies of a draft of this report to EPA for its review and comment. On January 29, 1997, we met with EPA officials, including a senior process manager from EPA's Office of Emergency and Remedial Response and officials from EPA's Office of Enforcement and Compliance Assurance and Solid Waste and Emergency Response, to obtain their comments. EPA generally agreed with the facts, conclusions, and recommendations in the report. However, while not disagreeing that the lessons learned should be documented, EPA did question the benefits of preparing voluminous site-specific studies on lessons learned, given the decreasing use of incineration. We concur that the type of documentation should be concise and the format useful. EPA also provided technical and editorial comments, which we incorporated in the report as appropriate.

Scope and Methodology

To examine EPA's oversight of incinerators at Superfund sites, we visited the three Superfund sites with operating incinerators: the Baird and McGuire site in Massachusetts, the Bayou Bonfouca/Southern Shipbuilding site in Louisiana, and the Times Beach site in Missouri. At these sites, we spoke with EPA, state government, U.S. Army Corps of Engineers, and contractor officials to determine how the incinerators operate, what safety measures they employ to ensure safe operation, and what oversight activities occur. We also interviewed EPA officials in regions I, VI, and VII and in the headquarters offices of Solid Waste, Emergency and Remedial Response; Pollution Prevention and Toxics; and Enforcement and Compliance Assurance. In addition, we obtained and analyzed documents and data from EPA and from the relevant states, counties, and responsible parties when necessary. Our work was performed in accordance with generally accepted government auditing standards from February through December 1996.

As arranged with your offices, unless you publicly announce its contents earlier, we will make no further distribution of this report until 10 days after the date of this letter. At that time, we will send copies of the report to other appropriate congressional committees; the Administrator, EPA; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request. Should you need further information, please call me at (202) 512-6520. Major contributors to this report are listed in appendix II.

Stanley J. Czerwinski
Associate Director, Environmental
Protection Issues

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Figures

Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	Environmental Protection Agency
NPL	National Priorities List
OECA	Office of Enforcement and Compliance Assurance
RCRA	Resource Conservation and Recovery Act

Three Case Studies

We visited the three Superfund incinerators that were in operation at the time of our review: the Baird and McGuire site in Holbrook, Massachusetts; the Bayou Bonfouca/Southern Shipbuilding site in Slidell, Louisiana; and the Times Beach Superfund site near St. Louis, Missouri. A brief description of the incineration project at each site follows.

The Baird and McGuire Superfund Site

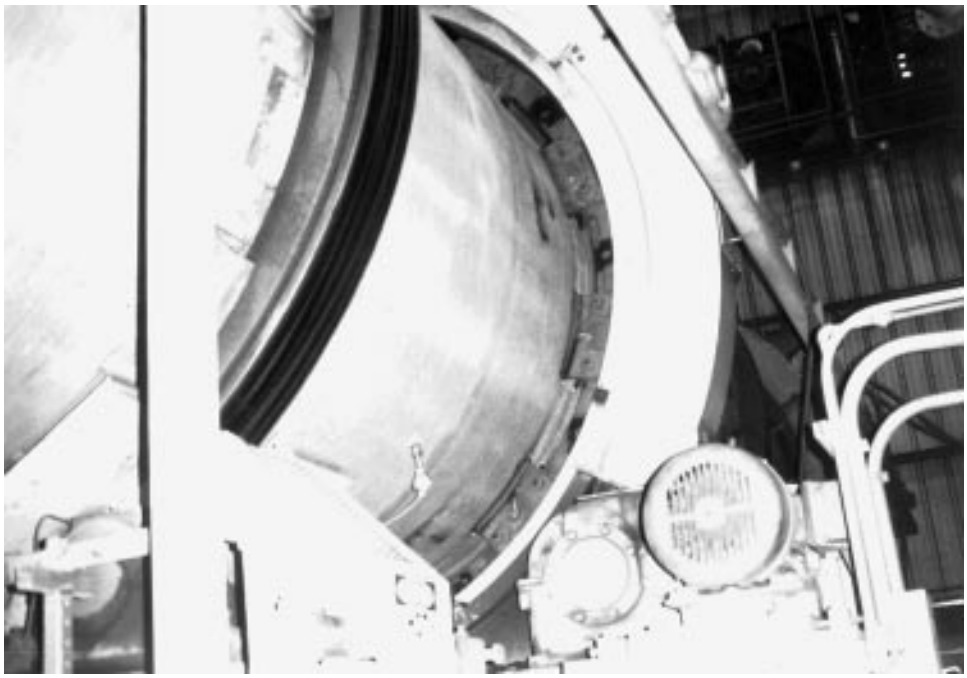
The Baird and McGuire site, approximately 14 miles south of Boston, is a former chemical manufacturing facility that operated for 70 years until it was shut down in 1983. This 20-acre site is contaminated with approximately 200,000 pounds of chemicals and metals, including creosote, herbicides and pesticides, arsenic, lead, and dioxin. Chemicals from the site have contaminated groundwater, a nearby river, and a nearby lake.

EPA chose to incinerate soil and other contaminated material on-site because it judged that this remedy would be the most protective of human health and because complicating factors made other remedies, such as covering the contaminated areas with a clay cap, inappropriate. These factors included the location of part of the site in a 100-year flood plain, the existence of wetlands on the site, and the potential for the contamination to spread farther (via groundwater) if the site was not effectively treated. In addition, dioxin is present at the site, leaving few off-site treatment possibilities because regulations limit the locations at which dioxin-contaminated material can be treated.[8]

The operation of the incinerator at the Baird and McGuire site began in June 1995 and is expected to be completed in April 1997. The incinerator was designed specifically to remediate the high levels of metal contamination at the site. (See fig. I.1.) It is configured to capture the metals (which cannot be destroyed by the incineration process and may be present in the gases produced by the burn) in a pollution control device before they are emitted into the atmosphere. The incinerator has 13 automatic waste feed cutoffs. In case the incinerator is totally shut down, a diesel backup system will keep filtration systems running to prevent the release of hazardous emissions. Emissions from the site are monitored continuously from the incinerator's stack and from nine locations along the site's perimeter.

[8]For further information see Superfund: EPA has Identified Limited Alternatives to Incineration for Cleaning Up PCB and Dioxin Contamination (GAO/RCED-96-13, Dec. 29, 1995).

Figure I.1: Kiln at Baird and Mcguire



Oversight is carried out by 12 staff from the U.S. Army Corps of Engineers, who receive technical assistance from an engineering consulting firm. According to a Corps engineer at the site, the Corps staff complete inspection reports detailing on-site events 2 to 3 times per day and provide weekly summary reports for EPA's review.

The Bayou Bonfouca/Southern Shipbuilding Superfund Site

The Bayou Bonfouca site includes 55 acres of sediment and surface water that were contaminated with wood-treating chemicals from an abandoned creosote works plant. The main threats to human health at this site included direct contact with contaminated groundwater, the potential for contamination to spread to a nearby waterway during flooding, and the potential for direct contact with concentrated hazardous material at the unsecured site. From February 1992 through September 1995, EPA incinerated contaminated soil and other material.

After incinerating the waste from the Bayou Bonfouca site, EPA began to use the incinerator to burn similar wastes from the nearby Southern

Shipbuilding Superfund site. (See fig. I.2.) This site was contaminated with 110,000 cubic yards of sludge, containing mostly polycyclic aromatic hydrocarbons that were left from barge cleaning and repair operations. Polycyclic aromatic hydrocarbons are chemicals formed during the incomplete burning of coal, oil, gas, refuse, or other organic substances.

Figure I.2: Incinerator at Bayou Bontouca

In addition to 15 automatic waste feed cutoff parameters to prevent the incinerator from operating outside the regulatory limits, the incinerator has an emergency stack venting system that further treats the gases from the kiln if the incinerator is totally shut down. In case of a power outage or another event that would cause the major functions of the incinerator to fail, this emergency system draws the kiln gases[9] into an emergency stack where a flame further destroys contaminants. According to an incineration

[9]The gases from the kiln are one of two residual products (ash is the other) resulting from the incineration process. Although most of the contamination is destroyed in the kiln under normal operating conditions, the kiln gases would go through a secondary combustion chamber for further treatment. This emergency system provides additional treatment when the incinerator shuts down and the secondary combustion chamber is not operating.

contractor official at the Bayou Bonfouca site, this emergency system prevents the release of kiln gases that exceed emission regulations.

Oversight at the Bayou Bonfouca site is carried out by a team of nine Corps of Engineers inspectors. These inspectors check the computer screens in the incinerator's control room every 2 hours to ensure that the incinerator is operating within the regulatory parameters set during the trial burn. The Corps team also inspects the incinerator's machinery, is present for all sampling and testing done by the incineration company, and documents all of the automatic waste feed cutoffs. Corps officials review monthly, quarterly, and yearly reports from the incineration contractor. Air monitoring at the site includes continuous monitoring from the stack, the excavation site, and other areas of the site, and samples are taken daily for more complete chemical analysis. According to Corps officials, emissions have never exceeded regulatory levels. In addition, EPA Region VI had two RCRA inspections completed at the Bayou Bonfouca site. However, the incinerator was shut down for maintenance at the time of one of the inspections. This Bayou Bonfouca/Southern Shipbuilding project was completed in November 1996.

The Times Beach Superfund Site

The Times Beach Superfund site is a 0.8-square-mile area, 20 miles southwest of St. Louis, that was contaminated with dioxin. The contamination resulted from spraying unpaved roads with dioxin-tainted waste oil to control dust. EPA decided to incinerate soil from Times Beach and 26 other nearby sites that were contaminated in the same way. (See fig. I.3.) EPA believed that incineration was the best remedy for the large volumes of dioxin-contaminated soil and the large pieces of contaminated debris to be treated. The incineration project at Times Beach began in March 1996 and is expected to be completed in March 1997.

Figure I.3: Dioxin Contaminated Soil From Times Beach

The Times Beach site is unusual because EPA obtained a RCRA permit to operate the incinerator. A permit is generally not required at Superfund sites, and the process of obtaining it resulted in some delays in beginning operations. However, EPA regional officials obtained the permit to provide nearby residents with additional assurance that the incinerator would operate safely and would be removed after the project was completed, rather than being kept in place to burn contaminated material from other sites. As required by the permit, the Times Beach incinerator has 17 automatic waste feed cutoffs. In addition, the incinerator includes the same emergency system that is used at Bayou Bonfouca.

Oversight at Times Beach is handled primarily by the Missouri Department of Natural Resources. State officials monitor operations on-site and via computer in the state capitol. Three on-site state employees originally provided oversight 24 hours a day. Currently, the state has oversight officials at the site 11-1/2 hours each weekday and 9 hours a day on the weekend. In addition, they conduct unannounced random visits to the site during off hours.

To supplement the state's oversight, St. Louis County inspects operations and tracks the results of air-monitoring testing to ensure that the incinerator's emissions are in compliance with the limits set in the county's air pollution permit.[10] According to a county official, although formal inspections are required about once every 2 years, the county informally monitors the site more frequently. As with the other sites, Times Beach has two levels of air monitoring: continuous monitoring and a more detailed laboratory analysis. According to EPA officials, emissions from the incinerator have never exceeded the permissible levels.

Despite extensive monitoring at the Times Beach site, incidents have occurred. Once, when an unexpected storm interrupted electrical power and caused a shutdown, the emergency system failed to fire. High winds had blown out the pilot lights on this treatment system, which should have fired after the power to the incinerator had been lost. Without the firing, the emergency system did not further treat the kiln gases as it was designed to do. Although EPA concluded that the event caused no significant health effects, the agency could only estimate emission levels during the shutdown because the air-monitoring equipment that would have recorded the actual emission levels was on the same circuit as the incinerator and, therefore, was not operating during the event. To prevent future emergency shutdowns from storm-related power losses, the incineration contractor hired local weather forecasting services to improve storm warnings and formally adopted a standard operating procedure to stop the waste feeds during severe weather. (This standard operating procedure had already been in force at the Bayou Bonfouca/Southern Shipbuilding Superfund site when the event occurred.) In addition, other measures were taken to prevent the emergency system's pilot lights from being blown out and to decrease the number of power outages.

Improper handling of the emission samples taken during a dioxin stack test was alleged following the discovery that the test samples were taken by a company that is a subsidiary of the incineration contractor. EPA maintains that the incinerator operator followed all required procedures for testing the samples. EPA has no regulation that prohibits the incineration contractor or one of its subsidiaries from taking, transporting, or analyzing the test samples. In addition, the time taken to deliver the samples to the laboratory was questioned—8 days from the time the samples left the site until they arrived at the laboratory. According to EPA

[10]EPA is also responsible for ensuring that the operating parameters are in compliance with the emission levels specified by the RCRA permit.

officials, the samples are stable, making the time taken to get them to the laboratory unimportant. State officials reviewed the testing and determined that the results were valid. However, in December 1996, the EPA Ombudsman issued a report on the allegations and recommended that a new stack test be conducted to ensure public confidence in the cleanup. EPA agreed to implement the Ombudsman's recommendation.

Major Contributors to This Report

James F. Donaghy, Assistant Director
Jacqueline M. Garza, Staff Evaluator
Richard P. Johnson, Attorney Adviser
William H. Roach, Jr., Senior Evaluator
Paul J. Schmidt, Senior Evaluator
Magdalena A. Slowik, Intern
Edward E. Young, Jr., Senior Evaluator

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