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Report to Congressional Requesters

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HAZARDOUS WASTE

A North Carolina Incinerator's Noncompliance With EPA and OSHA Requirements

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Congressional Requesters

In requests of August 23, 1990, and September 26, 1990, you asked us to review the Caldwell Systems, Inc. (CSI) hazardous waste treatment, storage, and incineration facility in Caldwell County, North Carolina, to determine if CSI operated in compliance with the Resource Conservation and Recovery Act (RCRA), the Clean Air Act, and the Occupational Safety and Health Act. These acts help to ensure that hazardous waste facilities safely treat and dispose of such waste, limit air pollution, and help protect workers, respectively.

Caldwell County citizens had charged for years that the facility, which shut down completely in 1989 on order of the Caldwell County Superior Court, operated in an unsafe manner, causing serious harm to the environment and to the health of local residents and CSI employees. In response to these charges, federal, state, and local organizations investigated CSI and its environmental impact. The results of some of these studies are inconclusive and inconsistent about risk to public health; therefore, debate about CSI continues as the site is being cleaned up. (See app. II for a summary of these studies.)

As agreed, we examined (1) how the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the state of North Carolina fulfilled their roles in ensuring compliance with federal environmental and worker safety laws and regulations and how CSI complied with those laws; and (2) what policies and procedures EPA has for disposing of wastes from hazardous waste sites being cleaned up under the Comprehensive Environmental Response, Compensation, and Liability Act (known as Superfund) and what policies and procedures the Department of the Navy has for disposing of its hazardous waste at CSI.

Results in Brief

Although state and federal officials generally adhered to federal environmental and worker safety laws and regulations in their inspections of CSI, they may not have adequately encouraged CSI compliance with existing regulations. Further environmental and worker safety protection at CSI during its operation may have been limited by factors in the laws and regulations that allowed for less comprehensive coverage than would be available today.

Under RCRA, state and federal inspectors followed RCRA requirements and EPA policies concerning the timing of inspections. For the Clean Air Act, the state inspected the facility about twice a year, although the requirement in EPA's inspection policy was for once every 5 years. Under Occupational Safety and Health policy, CSI was not classified as a "high hazard" facility; therefore the state followed OSHA's inspection guidelines, which did not require an inspection until a formal complaint was filed.

Inspectors, often responding to local or state concerns, found that during the 10 years of CSI's operation, the facility often violated RCRA and Clean Air Act regulations. CSI promptly corrected each violation, but a pattern of repeated violations continued. Considering the numerous and repeated violations, North Carolina could have imposed more penalties to help ensure sustained compliance with environmental and worker safety regulations.

Environmental and worker safety protection may have been limited for several reasons. First, throughout its operations CSI was subject to less stringent federal and state environmental requirements under RCRA—interim status regulations. These regulations require owners/operators to follow "good housekeeping" practices, such as monitoring and inspecting the facility, but these requirements are less comprehensive than those in place for permitted hazardous waste facilities. In addition to these limitations, state and federal air pollution regulations were less restrictive during CSI's operations than they are now for incinerators like CSI. Second, traditional inspection practices may allow violations to go undetected. For example, detecting violations that occur when inspectors are not on-site is difficult, unless physical evidence of the violation is visible or the incident is recorded in the facility's operating logs. Lastly, under OSHA regulations, state officials were not required to and did not inspect CSI for OSHA compliance until an official complaint was filed in 1987, 10 years after CSI began operations.

Although CSI primarily processed hazardous waste from private industries between 1984 and 1989, the Department of the Navy and EPA sent hazardous waste to CSI for incineration and treatment. The Navy followed its normal contracting procedures, under which CSI was qualified for receiving hazardous waste. Although EPA had documented evidence in 1987 that CSI was releasing hazardous pollutants into the environment, EPA judged that the releases were not significant. Thus, EPA considered CSI to be an acceptable facility and continued to send hazardous waste there until a few months before CSI closed.

Hazardous waste incinerators in operation today are subject to more comprehensive laws, regulations, and policies than those that applied to interim status incinerators like CSI in the 1970s and 1980s. However, vigilant implementation and aggressive enforcement of state and federal regulations are necessary for these changes to be effective.

Background

The CSI facility in Hudson, North Carolina, was originally constructed by Caldwell County, which began operating it in 1976. In 1977 the county leased the facility to CSI. During CSI's operation, the facility incinerated waste and/or repackaged, consolidated, blended, and liquified it for off-site shipment or use as fuel. CSI typically handled solvents, glues, paints, sludges, and torpedo fuel. These materials were considered to be hazardous, posing potential health and environmental risks. According to EPA, incinerator ash and wastes that were not incinerated were usually sent to approved hazardous waste landfills for disposal.

The Congress enacted RCRA, the Clean Air Act, and the Occupational Safety and Health Act in part to regulate the management of hazardous waste, limit air pollution, and help protect workers, respectively. EPA administers RCRA and the Clean Air Act, and OSHA administers the Occupational Safety and Health Act. Under all three acts, although the language differs somewhat, a state can assume responsibility for carrying out a state program, as long as that program is at least as stringent as the federal program and provides adequate enforcement. During CSI's operation, North Carolina operated state programs under all three acts.

EPA and OSHA have established several enforcement policies that provide criteria for appropriate implementation of state programs. These policies direct states to (1) take enforcement actions against violators that will promote compliance with state and federal regulations and (2) recover economic benefits gained by violators who delay the permit process.

EPA and OSHA evaluate the state programs to ensure their adequacy, including tracking state enforcement actions at each facility. EPA officials are also required to participate in some RCRA inspections, including annual inspections of government-owned facilities like CSI.

CSI Often Violated Regulations, With Little Penalty Imposed

Facility inspections by federal and state officials are the primary tool for monitoring compliance with environmental and occupational safety laws. According to EPA, OSHA, and North Carolina records, CSI was inspected in accordance with all three laws. However, CSI had a history of repeated

violations under RCRA and the Clean Air Act. EPA and the state assessed lower penalties than the maximum allowed under these laws, thereby apparently doing little to discourage CSI's frequent noncompliance.

Inspections and Investigations Revealed Violations

RCRA requires a compliance inspection of a facility like CSI at least biennially. In addition, from 1986 through 1989, EPA required North Carolina to inspect CSI every 6 months because the agency was sending hazardous materials from sites it was cleaning up. According to EPA policy, a facility should be inspected within 6 months prior to receiving such waste. According to RCRA records, North Carolina and EPA adhered to RCRA requirements and EPA inspection policies. Between 1980 and 1989, CSI committed 65 RCRA violations—54 for operations and 11 for submitting late and deficient information in its permit application. CSI corrected each of the operating violations promptly. However, it repeated many of them. For example, North Carolina cited CSI for improper handling of hazardous waste containers seven times between 1982 and 1989. (See app. III.)

Under Clean Air Act regulations, the CSI incinerator was a "minor source" of regulated air pollutants and would normally have been subject to inspection once every 5 years. However, in light of persistent reports of heavy smoke, odors, and questionable incineration practices from both local citizens and state officials, North Carolina inspected the facility about twice a year, and conducted numerous investigations and surveillance during CSI's operation. The state also required CSI to conduct several incinerator emissions tests. From 1977 to 1987, the state conducted 65 compliance activities and documented 12 violations, often for excessive visible emissions and inappropriate incinerator operating conditions; CSI corrected its violations promptly. However, in 1977 and 1978, after CSI's air emissions were found to violate state regulations, North Carolina allowed CSI to continue operating for over a year before determining that CSI was complying with air pollution regulations; under normal operating conditions, North Carolina decided, CSI was not likely to violate regulations. (See app. IV.)

During CSI's operation, OSHA policy classified CSI as a "refuse system," which is not considered a "high-hazard" industry.[1] Therefore, North Carolina was not required to inspect CSI until a formal complaint was filed. However, in January 1987 CSI's safety manager requested a consultation from North Carolina to help recognize safety and health hazards and to

[1]High-hazard industries are those with a relatively high rate of injury or a history of serious OSHA citations. In fiscal year 1992, OSHA reclassified the refuse industry, which CSI was part of, as a high-hazard industry. Therefore, OSHA now has targeted this industry for periodic inspections.

improve CSI's safety and health program. In February 1987 a state occupational safety and health official provided a consultation and found no hazards. State occupational safety and health officials conducted the first inspection of CSI in August 1987, more than 10 years after CSI began operations, after the state's environmental protection office received a complaint from three CSI employees. This inspection identified nine violations. The state established a compliance schedule for CSI and determined that the violations were corrected promptly. This was the facility's only inspection for compliance with OSHA regulations. (See app. V.)

In 1990, after CSI closed, OSHA conducted a special monitoring investigation of North Carolina's occupational health and safety activity at CSI and criticized the state's practices. OSHA found that the state was untimely in inspecting the facility after receiving complaints and incorrectly classified serious violations as other than serious. However, the state did not accept OSHA's assessment of the violations and did not take any further enforcement action against CSI. OSHA did not pursue the enforcement issue with the state or CSI because CSI was closed and the statute of limitations for these violations had expired.

State Took Minimal Enforcement Actions

Throughout CSI's operations, North Carolina relied primarily on informal enforcement actions—issuing warnings or notices of violations—and rarely penalized the facility for violating environmental regulations. Under North Carolina law, the state could assess penalties of up to $10,000 per day per RCRA violation and up to $5,000 per air pollution violation.[2] EPA did not require North Carolina to assess penalties against CSI for every violation.

During the period of CSI's operations, North Carolina's enforcement policy was to take formal enforcement actions—issuing compliance orders and assessing penalties—only for long-term, very serious violations. The state usually took informal enforcement actions—issuing notices of violation and working cooperatively with the violator to resolve the problems identified. This was intended to bring the facility into compliance quickly without assessing penalties.

[2]Both RCRA and the Clean Air Act authorize EPA to assess or seek penalties of up to $25,000 per day for each violation and to suspend or revoke the violator's operating permit. To assess higher penalties, North Carolina could refer a case to EPA for enforcement.

For the 65 RCRA violations cited earlier, North Carolina could have fined CSI up to $666,000,[3] but instead the state assessed penalties for only 12 violations, totaling about $96,000. As of May 1992, North Carolina collected $10,914 plus $2,996 for untimely payment. CSI has contested the remaining $85,000, and North Carolina is pursuing litigation to collect the fines. For the 12 instances in which North Carolina found CSI out of compliance with air pollution regulations, the state could have fined CSI up to $5,000 for each violation, for a total of $60,000, but assessed no penalties. In all, North Carolina fined CSI about 13 percent of potential penalties.

Although CSI promptly corrected its violations, the same types of RCRA and Clean Air Act violations surfaced repeatedly between September 1977 and September 1986. For example, North Carolina cited CSI seven times for improperly handling hazardous waste containers, four times for emitting excessive smoke, and four times for improperly operating its incinerator burners. EPA's RCRA enforcement policy advises states to access penalties against "chronic" violators of RCRA regulations. However, the EPA policy does not define "chronic." According to the North Carolina Hazardous Waste Management chief, North Carolina never characterized CSI as a chronic violator because CSI promptly corrected each of its violations. In addition, the Clean Air Act enforcement policy does not define repeat violators.

As we have previously reported,[4] adequate penalties are an important deterrence against future violations. EPA recognizes this and articulated the disadvantages of informal enforcement actions in a July 1990 publication on the RCRA program:

"While informal enforcement actions can be effective in bringing facilities into compliance ..., such actions do not materially contribute to general, long-term deterrence. An enforcement program aimed only at bringing the facility into compliance and not at deterring future violations and encouraging voluntary compliance will be unsuccessful in the long-run."[5]

[3]This figure assumes that CSI would have corrected each violation within the first day of being notified of the violation. It also assumes that North Carolina would have assessed the maximum $10,000 penalty for each violation.

[4]Environmental Enforcement: Penalties May Not Recover Economic Benefits Gained by Violators (GAO/RCED-91-166, June 17, 1991); Air Pollution: Improvements Needed in Detecting and Preventing Violation (GAO/RCED-90-155, Sept. 27, 1990); and Hazardous Waste: Many Enforcement Actions Do Not Meet EPA Standards (GAO/RCED-99-140, June 8, 1988).

[5]The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study (EPA/530-SW-90-069, July 1, 1990), p. 60.

In addition, in 1987 North Carolina cited CSI for nine violations of the Occupational Safety and Health Act and could have assessed penalties of up to $1,000 for each violation, for a total of $9,000. Instead, because the state did not classify all of the violations as "serious," it fined CSI $720. CSI paid the fine in March 1988. North Carolina calculated this amount using OSHA formulas, taking the seriousness of the violations into account. In August 1990,[6] we reported that OSHA penalties in general were not high enough to provide an adequate deterrence against violations. Since then, the Congress and North Carolina have established a new penalty schedule that can be seven times as stringent. (See app. V.)

Requirements May Have Limited Environmental and Worker Protection

CSI's environmental and worker safety protection may have been limited, principally because (1) CSI operated under less stringent requirements than most hazardous waste facilities do now and (2) traditional on-site inspection practices may not detect violations.

CSI Was Subject to Less Stringent Hazardous Waste and Air Quality Standards

As we reported in October 1991,[7] recognizing that it would take EPA and authorized states many years to process all permit applications, RCRA allowed hazardous waste facilities that were in existence in November 1980 and had applied for a permit to operate under "interim status," that is, as though they had obtained a permit. CSI met these criteria but closed without meeting the permit requirements. As an interim status incinerator, it was subject to less comprehensive RCRA regulations than permitted incinerators. The permit regulations incorporate the interim status requirements and include additional technical, design, construction, and performance standards. For example, permitted facilities must continuously monitor operating conditions and maintain extensive monitoring records, while interim status incinerators must monitor conditions only every 15 minutes and are not required to maintain monitoring records. As part of the continuous monitoring requirement, permitted incinerators must have equipment to automatically cut off waste to the incinerator when operating conditions go out of compliance with the incinerator's permit; interim status incinerators are not required to have this equipment. Without this equipment, when operating conditions

[6]Occupational Safety and Health: Options for Improving Safety and Health in the Workplace (GAO/HRD-90-66BR, Aug. 24, 1990).

[7]Hazardous Waste: Incinerator Operating Regulations and Related Air Emission Standards (GAO/RCED-92-21 Oct. 16, 1991).

are not in compliance, undesirable releases of air pollutants may not be prevented or quickly minimized.

We also reported that the air emissions standards applicable to CSI under the Clean Air Act were only for traditional incinerator emissions, such as particulates and sulphur dioxide. Other hazardous substances that CSI emitted, such as chromium and cadmium, were not regulated under the act. However, the Clean Air Act Amendments of 1990 require EPA to establish emissions standards for 190 hazardous air pollutants according to a 10-year schedule. Moreover, North Carolina has adopted additional emissions standards. These new standards should provide for more comprehensive coverage of air-borne pollutants at incinerators than the earlier standards.

CSI was allowed to operate under the less stringent interim status RCRA regulations for about 9 years because the permitting process for CSI was lengthy and complicated. Interim status was extended principally because (1) EPA permitting regulations did not become effective until June 1982, (2) CSI encountered difficulty in providing adequate information for its permit application, and (3) CSI and Caldwell County were engaged in legal disputes over the facility's operation. Permit processing delays were not unusual in the 1980s. Even considering these delays, CSI's permit application progressed ahead of many other incinerator applications during that time. Nationally, as of December 1991, only 4 such incinerators in existence in November 1980 still remained under interim status regulations, down from 235 in 1986. (See app. VI.)

Inspections May Not Detect Problems

The limitations of traditional inspection practices can also allow violations to go undetected. Although North Carolina rarely documented visible emissions and odor violations, citizens' complaints and state officials' observations attest to these problems from the incinerator throughout its operations. For example, during 1987 North Carolina officials conducting vegetation studies near CSI reported instances of heavy smoke and fire and noted odors near CSI. According to North Carolina Air Quality inspectors and the incinerator manufacturer, visible emissions should not occur under proper operating conditions. However, only visible emissions that exceed 20-percent opacity (the amount of light displaced by visible emissions) for 6 minutes qualify as a violation. Because qualified air quality inspectors were not in the area during most of these incidents to measure opacity, North Carolina could not confirm these incidents as violations. In at least four other instances when air quality inspectors were

on-site, they either could not measure the opacity because of inadequate lighting or did not measure the opacity, instead informing CSI of the violations and allowing CSI to correct the problem while the inspectors were on-site.

In September 1990, we reported that because EPA and state regulators depend largely on inspections to detect violations of the Clean Air Act, the extent of air pollution violations may be significantly understated.[8] We also reported that continuous emissions monitors installed in smokestacks to measure smoke and other pollutants may be 10 times more likely to detect violations than physical inspections. With respect to CSI, North Carolina, beginning in 1985, required the facility to operate a continuous temperature monitor as part of its air quality operating permit. This monitor can indicate some periods of unpermitted incinerator temperature. However, the state was not required to and thus did not review all of the data from this equipment as part of its compliance monitoring. Instead, North Carolina reviewed only temperature data corresponding to the incinerator's operations either during actual inspections or periods of reported heavy smoke. The state did not detect any violation from its limited review of these data.

Similarly, RCRA inspections could not confirm the allegations made by former CSI employees of inadequate training to handle hazardous waste, frequent spills, and illegal disposal of hazardous wastes in the nearby landfill. Detecting violations that occur when inspectors are not on-site is difficult, unless physical evidence of the violation, such as the residue from a spill or illegal dumping, is visible or the incident is recorded in the facility's operating log. An EPA official said that employee interviews was also an inspection technique that could be used to uncover potential violations when inspectors were not on-site. In February 1992 North Carolina indicated that it had implemented a "resident inspector" program that authorizes a team of inspectors to be on-site at commercial facilities during operation hours.

With respect to occupational safety and health, North Carolina's practice of not routinely inspecting facilities like CSI allowed CSI to operate for over 10 years without being inspected for worker hazards. Thus, North Carolina would not have cited CSI for improper training and unsafe handling of hazardous substances before allegations were received and investigated in 1987.

[8]Air Pollution: Improvements Needed in Detecting and Preventing Violations (GAO/RCED-90-155, Sept. 27, 1990).

EPA and OSHA have taken steps to improve their oversight of facilities subject to both their regulations. In November 1990 EPA and OSHA signed a Memorandum of Understanding to improve their combined efforts to achieve protection of the workers, the public, and the environment. The memorandum included provisions for joint inspections, agency-to-agency referrals of potential violations, cross-training, and data exchange. It should enhance EPA's and OSHA's awareness of potential problems at hazardous waste treatment, storage, and disposal facilities like CSI and lead to more inspections where they are needed.

Similarly, in commenting on this report, North Carolina's Secretary for the Department of Environment, Health, and Natural Resources said that the state has recently placed all human health and environmental agencies into a single department to reduce enforcement fragmentation and increase accountability.

In addition, in May 1991 EPA and OSHA jointly issued a report on their evaluation of compliance with on-site health and safety requirements at 29 hazardous waste incinerators. EPA identified 75 violations of its standards, and OSHA 320 violations of its regulations. Both agencies indicated a concern with the widespread deficiencies in the area of worker health and safety training, which could lead to operational and exposure problems. The agencies are following up and/or plan to follow up on the violations found and have improved and/or plan to improve inspection procedures and expertise on incineration. For example, in March 1992 EPA indicated that all incinerators that have RCRA violations have either corrected them or plan to do so. EPA also stated that it is implementing a system that alerts OSHA to potential health and safety violations and has taken steps to provide more specialized training for inspectors at hazardous waste incinerators.

Federal Agencies Used CSI

Although CSI's customers were primarily from private industries, both EPA and the Department of the Navy shipped hazardous waste to CSI for incineration or treatment between 1984 and 1989. Between 1985 and 1989, EPA estimated that it sent about 385,300 pounds of hazardous liquid and sludge waste to the CSI facility from a variety of Superfund sites. According to EPA, the Navy shipped about 10,791,000 pounds of hazardous torpedo fuel waste to CSI for incineration under 3 contracts between 1984 and 1988. According to EPA, the Navy's waste accounted for up to 10 percent of CSI's incinerated waste. An EPA official stated that, as of May 1992, EPA was

recalculating the amount of Navy and EPA hazardous waste sent to CSI because of potential errors in its prior calculations.

EPA Judged CSI Acceptable Despite Problems

Although EPA knew about CSI's problems, it continued to send waste to the facility until August 1989. According to EPA's policy on Superfund waste disposal, formulated in 1985 for cleanups initiated before October 17, 1986, a hazardous waste treatment, storage, or disposal facility was acceptable if it had no violations or conditions that posed a significant threat to public health, welfare, or the environment or affected the satisfactory operation of the facility. For cleanups initiated after October 17, 1986, a facility was acceptable if it had no relevant violations and no unaddressed, environmentally significant releases of hazardous waste from the facility.[9] According to the EPA Region IV RCRA Compliance Chief, this policy does not define "environmentally significant;" rather, it leaves this determination to the discretion of the regions.

We found no evidence that EPA was aware of any unaddressed environmental problems at CSI before 1987. Thus, EPA Region IV included CSI on its list of acceptable facilities for Superfund waste. In September 1987 EPA Region IV documented, through sampling data, hazardous substance releases from CSI, including volatile organic compounds and chlorinated solvents in soil, groundwater, and springwater at and around the facility. EPA Region IV did not remove CSI from its list because it did not consider the releases to be "environmentally significant" compared with releases at other facilities in the region, according to the Region IV Compliance Chief. Therefore, EPA Region IV permitted EPA Region III and the EPA Office of Research and Development to send a total of about 300,000 pounds of Superfund hazardous materials to the facility after September 1987.

Although the Region IV RCRA Compliance Chief did not consider the releases from the CSI facility to be environmentally significant, public concern and pressure by an elected official have caused EPA to devote increased attention to facility cleanup since it closed. In April 1990 EPA ordered CSI and Caldwell County to take corrective action to address the contamination caused by CSI's releases. In addition, in July 1990 the Agency for Toxic Substances and Disease Registry issued a health

[9]A release is defined by EPA as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injection, escaping, leaching, dumping, or disposing to the environment. This includes releases to surface water, groundwater, land surface, soil, and air. Federally permitted releases, such as emissions that are in compliance with Clean Air Act permits and those that do not adversely affect public health or the environment, are not considered releases under this policy.

advisory, recommending that public access to the site be restricted and that the site be considered for Superfund cleanup. In August 1991 EPA concluded in a sampling investigation report that although contamination existed at the site, it did not pose a current risk to area residents. As of May 1992, EPA had not included the CSI facility on the National Priority List for Superfund cleanup but continued to pursue cleanup through the RCRA corrective action program.

Navy Followed Its Procedures

The Navy followed federal regulations in sending hazardous waste to CSI. Procurement regulations require the Navy to verify that a treatment, storage, and disposal facility is properly permitted to operate under RCRA but do not require any other enforcement-related information. As required by law, CSI was the lowest bidder, was properly permitted,[10] and was judged by the Navy to be capable of fulfilling the disposal contracts in accordance with all pertinent laws and regulations.

Moreover, Navy officials visited CSI twice, once in 1984 during a pre-award survey and again in 1986. According to a Navy contracting official, these site visits were not required under Navy procurement regulations. The reports of these visits did not document any conditions at the facility that Navy officials considered serious environmental or worker hazards. The 1984 report indicates that the local, state, and federal officials contacted about CSI's operations did not report any problems.

During the 1986 site visit, the visiting Navy official reported some "potential problems" at CSI—drum storage and occasional heavy particulate emissions. However, the official did not conclude that CSI was violating any laws or regulations or that these potential problems could prevent CSI from fulfilling its contract. This official told us that Navy procedures did not require him to take any action beyond noting these observations in his report for consideration by other contracting officials.

In 1989 the Navy investigated CSI in response to a claim against the Navy by three former CSI employees who alleged health problems resulting from their exposure to the Navy's hazardous waste. According to the investigation, the Navy supplied CSI with all the information required to adequately assess the hazardous nature of this waste and to protect CSI employees.

[10]Under RCRA, CSI, as an interim status facility, was considered as having been issued a permit until a final permit decision was made.

Conclusions

Although EPA, OSHA, and North Carolina generally adhered to federal laws and policies in implementing RCRA, the Clean Air Act, and the Occupational Safety and Health Act, environmental and worker safety protection at CSI may have been limited for several reasons. First, CSI was an interim status facility and therefore subject to less stringent RCRA regulations than permitted facilities. Second, air pollution regulations were more limited during CSI's operations than they are now for similar incinerators. Finally, because OSHA's policy considered CSI to be a low-hazard facility, North Carolina was not required and did not conduct a safety and health inspection until a formal complaint was filed 10 years after CSI began operations.

Nevertheless, federal and state inspectors found many operating deficiencies, air pollution problems, and worker hazards at CSI. While CSI promptly corrected most of the violations, many of them were repeated. Considering the numerous and repeated violations, North Carolina could have assessed more penalties to help ensure sustained compliance with environmental and worker safety regulations.

We found no evidence that either EPA or the Navy violated any federal regulations or agency policies by sending hazardous waste to CSI. Both agencies inspected the CSI facility and concluded that there were no significant environmental or worker safety problems that would have made it unacceptable.

Since CSI closed, significant changes have occurred nationally that should better protect human health and the environment and improve worker safety at facilities like CSI. These changes include (1) termination of interim status for all but four hazardous waste incinerators that had been in existence since 1980; (2) the enactment of the Clean Air Act Amendments of 1990; (3) OSHA's more stringent penalty schedule for violations; and (4) the Memorandum of Understanding between EPA and OSHA. However, vigilant implementation and aggressive enforcement of state and federal regulations are necessary for these changes to be effective.

Comments From EPA, OSHA, the Navy, North Carolina, CSI, and Caldwell County

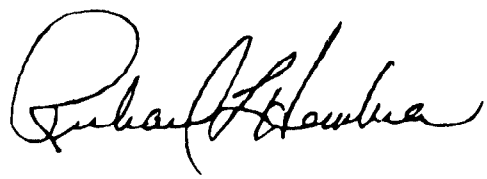
We provided a draft of this report to officials of EPA, OSHA, the Navy, and North Carolina and portions of the draft to the President of CSI and an official for Caldwell County for oral comment. They generally agreed with the facts presented but provided some technical clarifications. We incorporated their comments where appropriate.

To address your concerns, we obtained records and interviewed EPA, OSHA, North Carolina, and Caldwell County officials and local citizens. More specific information on our objectives, scope, and methodology is discussed in appendix I.

We conducted our audit work between February 1991 and May 1992 in accordance with generally accepted government auditing standards.

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 the Administrators, Environmental Protection Agency and Occupational Safety and Health Administration; the Governor of North Carolina; and the Manager, Caldwell County. We will also make copies available upon request.

If you have any questions about this report, I can be reached at (202) 275-6111. Major contributors to this report are listed in appendix VII.



Richard L. Hembra
Director, Environmental Protection
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House of Representatives

The Honorable Edward J. Markey
House of Representatives

The Honorable H. Martin Lancaster
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Abbreviations

ATSDR	Agency for Toxic Substances and Disease Registry
CSI	Caldwell Systems, Inc.
EPA	Environmental Protection Agency
FBI	Federal Bureau of Investigation
GAO	General Accounting Office
HRD	Human Resources Division
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
RCED	Resources, Community, and Economic Development Division
RCRA	Resource Conservation and Recovery Act
SBI	North Carolina State Bureau of Investigation

Objectives, Scope, and Methodology

In requests of August 23, 1990, and September 26, 1990, and in subsequent discussions, several Members of Congress asked us to review the Caldwell System, Inc. (CSI) hazardous waste treatment, storage, and incineration facility to determine (1) how the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the state of North Carolina fulfilled their roles in ensuring compliance with federal environmental and worker safety laws and regulations and how CSI complied with those laws; and (2) what policies and procedures EPA and the Department of the Navy have for disposing of their hazardous waste at CSI.

To achieve our first objective, we interviewed officials and obtained documentation from OSHA Region IV and EPA Region IV, both located in Atlanta, Georgia, which are the cognizant regions for facilities in North Carolina, and EPA headquarters in Washington, D.C. We also interviewed officials and obtained documentation from the North Carolina Department of Environment, Health, and Natural Resources offices in Raleigh, and Mooresville, North Carolina. Within this department, we contacted the Divisions of Environmental Management, Epidemiology, and Solid Waste Management. We obtained information on CSI's compliance with worker safety regulations from OSHA Region IV and the North Carolina Department of Labor, Division of Occupational Safety and Health, in Raleigh, North Carolina. We also obtained records from and interviewed officials in the Caldwell County government in Lenoir, North Carolina.

In addition, although we obtained documents from and interviewed local citizens living near the CSI facility and a local doctor that treated CSI employees and local citizens, we did not specifically address the many allegations made by these individuals about CSI-caused health and environmental problems because of ongoing lawsuits and the numerous studies (see app. II) that had been done or were being carried out by other federal, state, and local officials.

To achieve our second objective, we contacted officials at both the Department of the Navy and EPA. For information on the Navy's involvement with CSI, we interviewed officials from the Naval Sea System Command in Crystal City, Virginia, and obtained a Judge Advocate General report on this matter. We also interviewed Navy officials who administered the Navy's contract from the Naval Supply Center in Bremerton, Washington, and the Naval Undersea Warfare Engineering Station, in Keyport, Washington. For information on EPA's use of CSI for

hazardous waste incineration and treatment, we interviewed officials and obtained policy documentation from EPA Region IV.

We conducted our audit work between February 1991 and May 1992 in accordance with generally accepted government auditing standards.

Summary of Other Major Studies and Investigations of CSI

In the past several years, as allegations of illegal and hazardous operations at CSI proliferated, several regulatory and nonregulatory agencies and organizations conducted studies and investigations: the North Carolina State Bureau of Investigation (SBI), the Federal Bureau of Investigation (FBI), EPA, the state of North Carolina, the Agency for Toxic Substances and Disease Registry (ATSDR), the National Institute of Occupational Safety and Health, Duke University Medical Center, and Caldwell County Citizens for a Clean Environment. In addition, a local physician reported medical findings related to the site. Some of these studies' results are inconclusive and inconsistent and are, therefore, subject to debate.

SBI/FBI Investigation

In June 1987 the SBI initiated an investigation of numerous allegations on illegally disposed hazardous waste at and around CSI. In August 1988 the FBI joined the investigation. Investigators recorded allegations from local residents and former CSI employees about improper disposal of hazardous waste, dangerous working conditions, and excessive pollution from CSI's incinerator. The investigation continued until November 1989, when EPA, the SBI, the FBI, and Department of Justice officials decided that not enough evidence existed to sustain a criminal prosecution of CSI, and the investigation was closed. In October 1990 EPA and the FBI reopened this investigation. FBI closed its investigation in December 1991 with no criminal charges filed; EPA plans to close its case upon receipt of a declination memorandum from the Department of Justice.

EPA Investigations

Since 1987, EPA has conducted five environmental sampling investigations at and around the CSI facility. Sampling conducted in September 1987, August 1988, May 1990, and July 1990 revealed hazardous contaminants both on the CSI property and off-site in soil, surface water, and groundwater; low levels of organics were also being emitted from the landfill. EPA's most recent sampling, from September 1990 to April 1991, indicated that soil at the CSI facility was contaminated down to 6 feet in some areas and that groundwater around the facility and the landfill was contaminated above drinking water standards. However, EPA concluded in its August 1991 study that at the time of the study well water was not contaminated above safe drinking water levels and the site did not pose a current risk to area residents.

In addition, in October 1988, EPA excavated a portion of the Caldwell County landfill that is adjacent to the CSI facility, where, according to former employees, partially filled drums of hazardous materials had been

buried. The evidence obtained from the excavation project neither confirmed nor denied allegations of illegally buried drums, according to EPA.

EPA Region IV has formally evaluated its own involvement with CSI to identify ways to improve its handling of these types of facilities. As of February 1992, the region's draft report included recommendations that the region provide detailed technical assistance to the states on permitting/enforcement actions at hazardous waste incinerators and review these facilities to determine if the facilities' operations should be suspended for a history of numerous or repeated violations.

North Carolina Studies and Investigations

Since 1986 North Carolina officials have studied CSI's groundwater, soil, surface water, ambient air, air in the workplace, vegetation, and livestock. In 1986 the state's environmental epidemiology office began to investigate health issues related to the CSI incinerator, drawing, in part, upon North Carolina's environmental and biological monitoring data. According to a June 1990 report, the sampling data did not support any substantial current short-term or long-term risk to public health from contamination at and around the CSI facility. However, the report did conclude that some local health problems were plausibly associated with air emissions from CSI.

This investigation also reviewed a 1987 study by the state in which vegetation damage was documented downwind from the CSI incinerator. The 1987 study suggested that the damage was caused by hydrogen chloride deposits from the incinerator. The environmental epidemiology office's report concurred that the vegetative damage was plausibly associated with air emissions from CSI but questioned the validity of the study's methods and results. The state air quality office also questioned the study's conclusions.

National Institute of Occupational Safety and Health Study

As part of the Department of Health and Human Service's Centers for Disease Control, the National Institute of Occupational Safety and Health carries out research and develops standards to ensure safe and healthful working conditions for all working people. In July 1989 the Institute received a report of disabling neurologic conditions in three former CSI employees. Also, the North Carolina State Health Director requested the Institute to study CSI workers because of growing concerns about the risks of health effects from exposures to hazardous wastes. The Institute study

found that the majority of symptoms and signs noted in former CSI employees' medical histories and neurologic examinations were either nonspecific and common in the general population or probably related to identifiable syndromes or known causes other than work-related toxic exposures. A study specifically designed to determine whether the reported health conditions are related to exposures at CSI was determined to be infeasible.

Duke University Medical Center Health Study

In 1988 Duke University researchers conducted an epidemiological study to evaluate the prevalence of a respiratory illness—called "reactive airway" disease—in residents living near CSI. The study results showed no significant difference in reactive airway disease between these residents and a control group. However, the researcher responsible for this study told North Carolina that because of an extremely low participation rate (about 20 percent), the study's results were inconclusive.

Health Investigation

In May 1990, at EPA's request, the Agency for Toxic Substances and Disease Registry (ATSDR)—the agency within the Department of Health and Human Services responsible for helping determine the public health consequences of hazardous waste sites—evaluated the potential public health threat posed by CSI. ATSDR concluded that the waste-handling operations of CSI posed a significant health threat to former employees, who should seek medical treatment. ATSDR also concluded that CSI posed a potential threat to area residents that warranted additional environmental sampling. In July 1990, ATSDR issued a Public Health Advisory for CSI, recommending (1) restricted public access to the facility and surrounding properties, well-water monitoring, and additional environmental sampling of the area; and (2) consideration of the CSI facility for the National Priorities List for Superfund cleanup; and (3) a health study of residents living near the incinerator and family members of former CSI and other workers. In July 1991, ATSDR completed the field work of a symptom and disease prevalence study that compared persons living near the incinerator with another community. As of May 1992, the results of the study were not available to us. As of May 1992, EPA had not included the CSI facility on the National Priority List for Superfund cleanup but continues to pursue cleanup through the RCRA corrective action program.

Caldwell Concerned Citizens for a Clean Environment

Caldwell Concerned Citizens for a Clean Environment reported on environmental testing conducted at and around the CSI facility in October and November 1987. The report described "heavy" soil contamination and

the presence of polychlorinated biphenyls (PCBs). Also, the report stated that soot samples indicated contamination with toxic metals in "heavy concentrations."

Local Physician's Medical Findings

A local family physician in Caldwell County evaluated health conditions of about 14 residents who lived near CSI and 20 former CSI employees and their families. The physician reported a pattern of illnesses, including respiratory disease and toxic encephalopathy—a disease of the brain. He reported common symptoms among these patients, including headaches, nausea, irritability, balance disturbances, fatigue, and memory disturbances. The physician associated the illnesses among area residents with inhalation of air emissions from the CSI incinerator and the illnesses among the CSI employees with inhalation of and skin contact with toxic substances that they handled at CSI. According to this physician, these findings have been confirmed by several neurological and occupational medicine physicians throughout the United States.

CSI's Compliance With RCRA Monitoring and Enforcement

North Carolina and EPA monitored CSI extensively for compliance with RCRA regulations. Table III.1 shows that while CSI was in operation, the state conducted 22 inspections (5 jointly with EPA), 12 reinspections, and 12 financial reviews and found a total of 54 RCRA violations. North Carolina took formal enforcement actions against CSI for 12 of these violations, assessing penalties of about $96,000.

Table III.1: Chronology of RCRA Compliance Monitoring and Enforcement Activities

Date	Activity	Number of violations	Penalties assessed
09/09/81	Inspection	15	$0
11/06/81	Reinspection	0	0
09/14/82	Inspection	2	0
09/24/82	Reinspection	0	0
06/15/83	Inspection	3	0
07/25/83	Reinspection	1[a]	0
02/14/84	Inspection	3	0
03/08/84	Reinspection	0	0
09/19/84	Inspection	2	0
10/22/84	Reinspection	0	0
11/29/84	Inspection	4	0
01/11/85	Reinspection	0	0
04/05/85	Reinspection	0	0
06/04/85	Inspection	3	0
06/19/85	Reinspection	0	0
09/25/85	Financial review	1	10,914
11/11/85	Financial review	1	0
12/03/85	Financial review	0	0
12/06/85	Inspection	0	0
01/07/86	Financial review	1	0
02/18/86	Inspection	0	0
07/22/86	Inspection	0	0
11/25/86	Financial review	0	0
12/10/86	Joint inspection	0	0
12/12/86	Financial review	0	0
06/23/87	Inspection	1	0
07/30/87	Joint inspection	0	0
08/10/87	Reinspection	0	0
12/02/87	Financial review	0	0
12/15/87	Inspection	0	0

(continued)

Date	Activity	Number of violations	Penalties assessed
02/29/88	Inspection	0	0
03/29/88	Inspection	0	0
07/21/88	Joint inspection	3	0
09/28/88	Reinspection	0	0
10/25/88	Financial review	0	0
12/09/88	Financial review	0	0
12/14/88	Inspection	0	0
01/26/89	Joint inspection	3	0
02/02/89	Reinspection	0	0
02/07/89	Financial review	1	0
06/21/89	Inspection	0	0
09/13/89	Joint inspection	10	60,000
10/09/89	Reinspection	0	0
11/28/89	Financial review	0	0
12/03/89	Financial review	1	25,000
Total		**54**	**$95,914**

[a]This violation is not included in the total because it was the same violation as cited in the prior inspection; it had not yet been resolved because CSI disputed it.

RCRA Compliance Monitoring at CSI

The 1984 amendments to RCRA established specific requirements for frequency of inspections. Every hazardous waste treatment, storage, and disposal facility must be inspected for RCRA compliance every 2 years. The amendments also required EPA to inspect all state or local government-owned facilities annually. In addition, EPA policy calls for all facilities receiving Superfund hazardous waste to be inspected within 6 months prior to every waste shipment.

Since CSI qualified under each of these categories, EPA and North Carolina placed it on an extensive inspection schedule. According to North Carolina's inspection records, between December 1980 (when North Carolina was first authorized to conduct RCRA inspections) to December 1989, the facility was inspected for RCRA compliance an average of about once every 5 months. Also, North Carolina or EPA inspected CSI within 6 months prior to each shipment of hazardous waste from EPA. Finally, since Caldwell County (a local government) owned the facility, EPA and North Carolina officials jointly inspected the facility annually from 1986 to 1989.

During 22 inspections of CSI, North Carolina and EPA found 49 violations of RCRA regulations. North Carolina documented 15 of these violations (or about one-third) during CSI's first RCRA inspection in 1981. Table III.2 shows that CSI repeated many of its violations.

Table III.2: CSI's Repeated RCRA Violations

Type of regulation violated	Number of violations
Hazardous waste labeling	8
Hazardous waste containers	7
Facility inspection	6
Contingency plan	5
Waste analysis	4
Waste manifests	4
Training records	3

Although EPA's inspection policy does not specifically direct states to reinspect facilities, North Carolina reinspected CSI 12 times and confirmed that the violations were corrected promptly.[1]

EPA's RCRA implementation plans do not specify when states should conduct financial record reviews to ensure compliance with financial responsibility requirements. However, North Carolina conducted 12 financial record reviews between 1985 and 1989 and found 5 violations of financial, liability insurance, and trust fund requirements.

RCRA Enforcement Actions Against CSI

EPA's 1984 Enforcement Response Policy (revised in 1987) established the criteria for timely and appropriate enforcement actions for RCRA violations. North Carolina was authorized to issue compliance orders to require a facility to correct a violation and assess penalties of up to $10,000 per violation per day. However, under EPA's enforcement policy, states could take informal enforcement action—issuing a warning or notice of violation but not assessing any penalties—if the violator was not classified as a "high-priority violator."[2] However, if the violation continued beyond 90 days or if the violator was classified as a "high-priority violator," EPA's enforcement policy directed the state to take formal enforcement

[1]For one inspection, in September 1989, in which the state found violations, we could not find documentation of a reinspection.

[2]A high-priority violator is a hazardous waste handler that (1) has one or more of the most serious types of violations of groundwater, closure/post closure, and financial responsibility requirements, (2) poses a substantial likelihood of exposure to hazardous waste or has caused actual exposure, or (3) is a recalcitrant or chronic violator.

actions—issuing a compliance order and assessing a penalty. If the state failed to take timely and appropriate enforcement action against a violator, RCRA authorized EPA to take enforcement actions itself, including suspension or revocation of a permit/interim status and fines of up to $25,000 per day for each violation.

North Carolina took formal enforcement actions against CSI for 12 violations. In September 1989, after a fire at the facility, an EPA/North Carolina joint inspection revealed 10 RCRA violations that the state believed had posed a significant threat to human health and the environment and fined CSI $60,000. North Carolina also levied penalties against CSI for two financial responsibility violations—$35,914 for failing to maintain sudden liability insurance. As of May 1992, North Carolina had collected $10,914 plus $2,996 for untimely payment. CSI has contested the remaining $85,000, and North Carolina is pursuing litigation to collect the fines.

After each RCRA violation found, North Carolina issued a notice of violation, in accordance with EPA's enforcement policy. In all but one case, North Carolina documented that CSI returned to compliance within 90 days of the notice of violation.[3]

[3]In 1983 CSI disputed one violation and required additional time after the reinspection to verify it. The issue was resolved sometime before the next inspection, about 7 months later.

CSI's Compliance With Clean Air Act Monitoring and Enforcement

North Carolina monitored CSI extensively for compliance with state regulations established under the Clean Air Act. Table IV.1 shows that the state conducted 21 regular inspections, 1 reinspection, 33 investigations and surveillances in response to various allegations, and 10 air emissions tests. These activities and routine record reviews revealed 10 violations and 2 potential violations of air pollution regulations. Following its enforcement policy, North Carolina did not take any formal enforcement actions or assess any penalties against CSI for these violations.

Table IV.1: Chronology of Clean Air Act Compliance Monitoring Activities

Date	Activity	Violations	Significant findings
05/17/77	Inspection	2	Use of liquid waste as fuel; Storage of hydrocarbons in tanks
06/08/77	Inspection	0	None
06/29/77	Emissions test (visual only)	0	0 to 5% opacity[a]
09/20/77	Emissions test	1	Excessive particulate emissions
12/06/77	Emissions test	0	Emissions complied with standards
12/12/77	Inspection	0	Chlorinated waste on premises
09/25/78	Inspection	0	Facility not operating
12/21/78	Inspection	0	Facility not operating
03/29/79	Inspection	0	10 to 20% opacity
08/24/79	Emissions test (visual only)	0	Emissions complied with standards
06/19/80	Inspection	1[b]	50% opacity
10/29/80	Inspection	0	No visible emission
01/22/81	Inspection	1[b]	50% opacity
08/19/81	Investigation	0	No excessive visible emissions
09/08/81	Surveillance	0	No visible emission
09/11/81	Surveillance	0	About 20% opacity—inconclusive
09/15/81	Emissions test (visual only)	1	Excessive visible emission
09/18/81	Surveillance	0	No visible emission
09/21/81	Surveillance	0	No visible emission
09/24/81	Surveillance	0	No visible emissions
09/28/81	Surveillance	0	No visible emission
10/02/81	Surveillance	0	10% opacity
10/05/81	Surveillance	0	No visible emission
10/12/81	Surveillance	0	10 to 15% opacity
10/14/81	Investigation	0	Training caused heavy smoke; Runoff pit caused odor

(continued)

Date	Activity	Violations	Significant findings
10/16/81	Surveillance	0	5 to 10% opacity
10/19/81	Surveillance	0	5 to 10% opacity
10/23/81	Surveillance	0	5 to 10% opacity
10/30/81	Surveillance	0	15 to 20% opacity
11/02/81	Surveillance	0	5% opacity
11/06/81	Surveillance	0	15% opacity
03/16/82	Inspection	0	10 to 20% opacity—inconclusive
03/19/82	Investigation	0	Heavy smoke/odor during cleaning
02/03/83	Inspection	0	Facility in compliance
08/09/83	Inspection	1	Operations not in compliance
08/09/83	Investigation	0	Odor from styrene monomer spill
08/30/83	Emissions test	0	Emissions complied with standards
09/29/83	Inspection	0	20% opacity
05/17/84	Inspection	0	100% opacity for 20 seconds
05/31/84	Emissions test	0	Emissions complied with standards
07/19/84	Emissions test	0	5% average opacity
12/07/84	Inspection	0	15% opacity
07/23/85	Inspection	1	Incinerator temperature too low due to inoperable burner switch
09/24/85	Reinspection	0	Facility in compliance
10/24/85	Emissions test	0	No observer—results unofficial
05/29/86	Inspection	0	Facility in compliance
09/11/86	Inspection	2	Excessive opacity/temp too low
11/03/86	Investigation	0	Heavy smoke during cleaning
11/24/86	Inspection	0	Facility in compliance
04/07/87	Investigation	0	Emissions visible—inconclusive
04/14/87	Surveillance	0	Glow from stack—no opacity read
04/30/87	Surveillance	0	Glow from stack—no opacity read
05/07/87	Surveillance	0	No visible emission or odors
05/14/87	Inspection	0	Facility in compliance
06/10/87	Surveillance	0	5 to 10% opacity
06/25/87	Surveillance	0	No visible emission
07/01/87	Surveillance	0	5% opacity
07/23/87	Surveillance	0	5% opacity
08/13/87	Inspection	0	Less than 5% opacity
10/20/87	Emissions test	0	Trial burn and particulate test
11/17/87	Surveillance	0	No visible emissions

(continued)

Date	Activity	Violations	Significant findings
01/26/88	Surveillance	0	No visible emissions
01/29/88	Surveillance	0	No visible emissions
02/10/88	Surveillance	0	No visible emissions
09/13/89	Investigation	2	Unpermitted fire/pollution

[a]Opacity is the amount of light displaced by visible emissions: 20 percent or less is allowable under regulations

[b]We consider this to be a potential violation because inspectors observed a violation of visible emissions standards but did not officially measure and document the violation.

Clean Air Act Compliance Monitoring

EPA established inspection guidelines for states to follow for stationary air pollution sources, including incinerators. However, EPA only established minimum inspection frequency guidelines for "major sources"—facilities with the potential to emit 100 tons or more of regulated pollutants per year. Nonetheless, North Carolina, as well as most other states, usually agrees with EPA to inspect minor sources once every 5 years, according to the Region IV Air Compliance Chief.

According to North Carolina, CSI was considered a minor source throughout its operations. CSI's 1987 emissions estimates confirmed that the incinerator qualified as a minor source at that time. Although EPA did not require regular inspections of minor sources, North Carolina states that the CSI facility was inspected more often than required for major sources because of the high level of public concern.

According to EPA's 1986 inspection policy, states should conduct "minimally acceptable" compliance inspections. This means that the inspector should record the operations to determine whether they are consistent with the facility's permit and check the operating logs. The guidance also states that visible emissions should be evaluated during the inspection but no direct measurement of the operating conditions is required.

North Carolina's records indicate that between May 1977 and May 1988 North Carolina's Air Quality Section inspected CSI at least 21 times—an average of about twice a year (see table IV.1). These inspections generally met the criteria for minimally acceptable compliance inspections, as defined by EPA.[1] In all the inspection reports we reviewed, the inspectors

[1]Complete documentation was not available for two inspections—one in Dec. 1977 and another in July 1985—so we could not verify whether the inspection criteria were followed in these cases.

recorded CSI's operating conditions to identify any unpermitted changes in operations, conducted a visible emissions evaluation (when possible), and, starting in January 1985, checked the temperature monitoring logs.

In addition to these inspections, North Carolina officials conducted investigations and surveillance of CSI on at least 33 occasions in attempts to verify complaints of excessive smoke and/or odors from the incinerator. Between August 1979 and January 1988, North Carolina received at least 32 complaints from local citizens of excessive smoke and/or odors from CSI. As early as 1979, North Carolina had argued that it took extraordinary compliance monitoring measures at CSI.

In the course of the inspections, investigations, and surveillance, North Carolina found CSI out of compliance with air quality standards. Violations included improper operation of incinerator burners and excessive visible emissions. Inspection reports indicate that CSI corrected these violations immediately or prior to the next inspection.

In addition, inspectors reported at least two potential violations. In these cases, inspectors observed heavy smoke from the facility but did not document the visible emission using the official test method. Instead, in accordance with the state's enforcement policy, they worked with the facility to reduce the visible emissions immediately.

In two additional instances, inspectors reported observing visible emissions of about 20-percent opacity (over 20 percent is a violation), but could not measure the opacity because of inadequate lighting conditions. All other inspections and site surveillance verified CSI's compliance with visible emissions control standards.

Emissions Testing

Under its air quality permit, CSI was subject to emissions control standards for particulates, sulfur dioxide, visible emissions, odorous emissions, and mercury. North Carolina's regulations authorized the state to request any information from a permit applicant and "conduct any inquiry or investigation" that it considered necessary, including emissions testing.

Consequently, CSI performed seven emissions tests throughout its operating life to demonstrate that it could comply with the state's emissions control standards. North Carolina inspectors were present at all but one test to ensure that CSI conducted them properly and to confirm

that visible emissions were within legal limits.[2] CSI's first emissions test in September 1977 revealed particulate emissions in violation of state regulations. North Carolina notified CSI of the noncompliance but allowed CSI to continue operating until April 1978, more than 1 year after the company began operations, before documenting with test results that CSI could comply with this regulation. North Carolina allowed CSI to operate because the state determined that under normal operating conditions there was a "good chance" that CSI would not violate regulations during this time, despite the failing test results. State regulations did not strictly require CSI to produce favorable emissions test results.

Also, to test only visible emissions for compliance, North Carolina conducted three visual emissions evaluations. In the September 1981 test, the state found CSI's emissions in violation of state regulations.

In addition to this emissions testing, North Carolina conducted a special ambient air study in the vicinity of CSI's incinerator in November 1987. The results indicated no significant quantity of metals from the incinerator's emissions at that time.

Record Reviews

CSI's air quality permit was revised several times to include various self-monitoring and reporting requirements. North Carolina reviewed records from this self-monitoring to evaluate CSI's compliance with state regulations and permit provisions. For example, beginning in January 1985, North Carolina required CSI to continuously monitor and record the incinerator temperature, submit an annual listing of the waste it had incinerated in the previous year, and report any noncompliant emissions within 4 hours. Although North Carolina inspectors did not review all of CSI's temperature monitoring data to evaluate continuous compliance with temperature requirements, they did read the temperature data while on site to verify that CSI was operating at the permitted temperature during the inspection or during the period of reported heavy smoke. Inspectors did not document any violations on the basis of their reviews of these temperature data.

Also, North Carolina imposed restrictions on the composition of the waste. Various types of wastes were prohibited by CSI's permit, and CSI was required to obtain permission to burn any new waste types. North Carolina relied primarily on reports from CSI about its waste to monitor compliance

[2]CSI conducted a stack emission test in October 1985 without ensuring that a North Carolina official was present to certify the test. Therefore, North Carolina informed CSI that it would not consider the test results official.

with these provisions. In January 1987 North Carolina began monitoring CSI more closely by requiring it to submit a detailed quarterly report on its operations.

On the basis of its reviews of the self-monitoring information provided by CSI, North Carolina documented two air quality permit violations. In January 1985, CSI reported burning wastes that were not allowed under its permit. Also, in November 1987, North Carolina learned that CSI failed to construct its new emissions stack according to approved plans as incorporated into its air quality permit.

Clean Air Act Enforcement Actions Against CSI

EPA did not establish any criteria for timely and appropriate enforcement actions for violations by a minor source, such as CSI.[3] North Carolina laws and regulations authorized various enforcement actions, including revocation of the violator's permit and assessment of a penalty of up to $5,000. However, under the state's enforcement policy when CSI operated its incinerator, only long-term and very serious violations were considered for enforcement action. The state's first priority was to resolve the identified problem, working cooperatively with a violator. In accordance with state policy, records indicate that North Carolina did not take any enforcement actions against CSI, beyond notifying CSI of its violations verbally during an inspection or by letter. Instead, the state worked with CSI to promptly correct the violations.

The Clean Air Act authorized EPA to take enforcement actions, including bringing an action in federal district court to seek a $25,000 per day penalty against any violators if the state failed to do so. EPA could take such actions regardless of whether the sources are major or minor. However, since CSI was a minor source, EPA did not monitor the state's compliance monitoring and enforcement actions relating to CSI to determine whether the state's actions were appropriate.

[3]EPA's Timely and Appropriate Enforcement Response Guidance applied only to "significant air pollution violators," namely, major sources and sources subject to new source performance standards and national emissions standards for hazardous pollutants. CSI was not included in any of these categories.

CSI's Compliance With Occupational Safety and Health Act Monitoring and Enforcement

Throughout CSI's operation, North Carolina provided one consultation and conducted one compliance inspection. The consultation was to identify hazards in the workplace and to provide assistance on ways to remedy the hazards; no hazards were identified. The inspection was to evaluate CSI's compliance with occupational safety and health regulations; nine violations were found. Following OSHA's enforcement policy, the state assessed a penalty against CSI for only one of these violations.

Compliance Monitoring at CSI

Establishments that want help in recognizing and correcting safety and health hazards and in improving their safety and health programs can receive a consultation funded by OSHA. North Carolina performs this service for establishments located within its borders. In January 1987 CSI's safety manager requested such a consultation. In February 1987 a state occupational safety and health official examined the facility and did not observe any hazards.

Most establishments, including CSI, are subject to OSHA inspection. Inspections can be categorized as either programmed or unprogrammed. Facilities are selected for programmed inspections according to national scheduling plans for safety and health or special emphasis programs. Facilities are selected for unprogrammed inspections when OSHA or the authorized state receives (1) a report of an alleged imminent danger, (2) a report of an accident involving a fatality or catastrophe, (3) an allegation of violations threatening physical harm, or (4) a referral from other officials, agencies, or the media describing a potential serious hazard. These inspections should be conducted within 5 days for a referral or complaint of a serious violation—one that poses a substantial threat of death or serious physical harm—or 30 days for an other than serious violation.

Following OSHA's criteria, North Carolina did not consider CSI to be a high-hazard manufacturing industry and therefore did not conduct a programmed inspection. The OSHA Region IV Safety Program Manager told us that facilities that destroy hazardous waste are listed as "refuse systems" and would be ranked no higher than 122 out of 198 industries on North Carolina's priority ranking list. Furthermore, North Carolina worker safety officials did not receive a complaint or referral concerning CSI to warrant an unprogrammed inspection until 1987.

North Carolina conducted one inspection at CSI from August to November 1987, following a referral from another state agency of allegations of

improper training, handling, and disposal of hazardous waste at CSI and a written complaint from a CSI employee. The inspection began 105 days after the complaints were formally registered. According to OSHA records, North Carolina failed to inspect CSI promptly because of limited staff.

As a result of this inspection, North Carolina cited CSI for nine violations of health and safety regulations (see table V.1). One violation was classified as serious and the remaining eight as other than serious.

Table V.1: CSI's Violations of OSHA Regulations

Description	Classification
Failure to provide quick drenching (eye wash/safety shower) facility in the production area[a]	Serious
Failure to provide physician with required information	Other than serious
Failure to furnish employee with a copy of physician's written opinion	Other than serious
Failure to establish decontamination procedures	Other than serious
Failure to provide adequate gloves (hand protection)	Other than serious
Failure to provide adequate selection of escape respirators	Other than serious
Failure to store respirators in a clean location	Other than serious
Failure to inspect self-contained breathing apparatus monthly	Other than serious
Failure to provide quick drenching or flushing facility for eyes or body at the laboratory[a]	Other than serious

[a]North Carolina considered the lack of a quick drenching facility in the production area more serious than at the laboratory because the potential for an accident was greater in the production area.

In 1990, after CSI closed, OSHA conducted a special monitoring investigation of North Carolina's occupational health and safety activity at CSI and criticized the state's inspection practices. OSHA found the state to be untimely in inspecting the facility after receiving complaints and to incorrectly classify serious violations as other the serious. However, the state did not accept OSHA's assessment of the violations and did not take any further enforcement action against CSI. OSHA did not pursue the enforcement issue with the state or CSI because CSI was closed and the statute of limitations for these violations had expired.

Enforcement Actions Against CSI

Under OSHA's enforcement policy, states are instructed to take enforcement actions against violators, including establishing a compliance date for each violation, assessing penalties, and conducting a follow-up inspection on or shortly after the date for serious violations. At the time of this inspection, the Occupational Safety and Health Act had established a penalty schedule with penalties of up to $1,000 per serious violation and up to $10,000 per willful or repeated violation. Penalties of up to $1,000 were optional for other than serious violations. North Carolina adopted this penalty schedule.

North Carolina issued CSI a citation and notification of penalty establishing a compliance schedule for each of the nine violations and assessing a penalty of $720 for the serious violation. In March 1988 CSI paid its penalty and notified North Carolina that it had corrected each of the violations by the compliance date. According to the Assistant Bureau Chief for Compliance, North Carolina determined that a follow-up inspection was not necessary. She stated that the responses submitted by CSI were appropriate responses given the severity of the offenses found. She further explained that CSI employees were not in imminent danger; therefore, a follow-up inspection was not warranted for the single serious violation.

In August 1990 we reported that OSHA penalties were not high enough to provide an adequate deterrent against violations.[1] In March 1991 the Congress established a more stringent penalty schedule. Similarly, North Carolina increased its OSHA penalties in 1990 and again in 1991 to correspond with the congressional changes.

Penalty amounts were increased significantly under the 1991 change. The maximum penalty that may be proposed for a serious or an other than serious violation is $7,000. In the case of willful or repeated violations, a civil penalty of up to $70,000 may be proposed, but the penalty may not be less than $5,000 for a willful violation. For specific violations of the act, civil penalties of up to $7,000 may be proposed. Penalties for failure to correct a violation may be up to $7,000 for each day that the violation continues beyond the final abatement date.

[1]Occupational Safety and Health: Options for Improving Safety and Health in the Workplace (GAO/HRD-90-66BR, Aug. 24, 1990).

CSI Permitting History

North Carolina, in accordance with RCRA and the Clean Air Act, required CSI to apply for and obtain operating permits.[1] While CSI readily obtained an air quality permit under the Clean Air Act when it began operating, it spent 9 years in the process of obtaining a RCRA permit; it finally closed without a permit. While North Carolina processed CSI's RCRA permit application, RCRA allowed the facility to operate under interim status regulations, which were less stringent than regulations for permitted facilities. The complicated RCRA permit process was aggravated by CSI's submittal of late and deficient information for the application and legal disputes between CSI and Caldwell County. However, long delays in the RCRA permitting process were not unusual during the 1980s.

RCRA Permitting

One of the most important aspects of the RCRA hazardous waste regulatory program is the permitting of hazardous waste treatment, storage, and disposal facilities. The process for making final permit determinations is comprehensive.

The process usually begins with a permit application "call-in letter;" for this the issuing agency requires the facility to submit an application within a set period of time. EPA and authorized states did not call in incinerator permit applications until after the permitting regulation came into effect in June 1982. After the application is submitted, EPA or the authorized state (the permitting authority) must determine whether the information in the application is complete and adequate. If not, the permitting authority issues a notice of deficiency to the owner/operator, requesting the specific additional information necessary to complete the application.

For incinerators, the owner/operator must either conduct an approved trial burn or provide adequate information to demonstrate that the facility can operate in compliance with the performance standards in the RCRA regulations. This should provide the permitting authority with the parameters for proper operating conditions for the facility to meet the performance standards.

The permitting authority reviews all of the necessary information, including the trial burn results, if required, and determines whether the application satisfies all technical requirements and whether the facility can meet all of the RCRA performance standards. Depending on the results of this review, the permitting authority prepares either a draft permit, reflecting the conditions necessary to meet the performance standards, or

[1]The Occupational Safety and Health Act did not impose any permitting requirements.

a notice of intent to deny the permit. After an appropriate period for public comment, the permitting authority makes its final determination.

RCRA allowed facilities that were in existence on November 19, 1980, and that had initiated a permit application to operate under interim status—that is, as though they had a permit—until final determination of their permit applications. These interim status facilities were required to comply only with the interim status regulations; when facilities receive permits they must comply with the permit regulations. The interim status regulations require owners/operators to follow "good housekeeping" practices, such as monitoring and inspecting the facility. The permit regulations establish more detailed performance standards that are intended to provide greater assurance that the environment is adequately protected.

CSI's RCRA Permit Process

CSI was allowed to operate for about 9 years under interim status, without a RCRA permit, because (1) permitting regulations did not come into effect until June 1982, (2) CSI did not provide sufficient information in a timely manner, (3) it took several years for North Carolina to process the facility's application, and (4) legal disputes precipitated changes in operation at the facility in its final years.

Although RCRA regulations were effective in 1980, the RCRA incinerator permitting requirements applicable to CSI did not become effective until June 1982. In 1980, CSI submitted the first part of its RCRA permit application, covering general information about the facility, as required to qualify for interim status. Over 19 months later, on July 12, 1982, when EPA's permitting requirements came into effect, North Carolina "called-in" CSI's full application, which included detailed and highly technical information about the facility. CSI submitted the full permit application 6 months later, as required, in January 1983.

However, CSI did not include enough information to completely process the application, and it took about 7 years before North Carolina had enough information to make a determination on the application. After CSI decided to close the incineration portion of its facility in 1987, it amended its application for the treatment and storage facility that remained. North Carolina again began processing CSI's application. However, CSI withdrew its application in October 1989 and closed in December 1989, before North Carolina had made a final determination on the amended application.

One factor contributing to the delay in CSI's permit was that CSI repeatedly submitted deficient applications. In fact, North Carolina issued CSI seven notices of deficiency. Many of these notices were for insufficient information in the application about CSI's plans for conducting a trial burn. In each case, North Carolina set a deadline for CSI to provide additional information. In four instances CSI provided the information 5 to 30 days after the deadline.

According to RCRA regulations, submittal of late or deficient information for a RCRA application is grounds for termination of a facility's interim status—forcing the facility to close. Less drastically, North Carolina was authorized by state law to assess a penalty against the applicant of up to $10,000 per day for late or deficient applications. EPA's 1984 enforcement response policy suggested that states issue penalties for these types of violations because they represent "substantial economic benefit" for the violator. The longer an owner/operator can delay obtaining a permit, the longer it can delay capital expenditures that may be necessary to comply with the stricter permit regulations. However, according to the North Carolina hazardous waste management chief, North Carolina did not pursue any formal enforcement actions against CSI in most of these instances for at least two reasons. First, these notices of deficiency to CSI did not necessarily indicate violations of the permitting regulations, rather a request for additional information that CSI may not reasonably have known was required. Second, CSI did not derive substantial economic benefit from the delays in the permitting process, since it continued to make capital expenditures during this time.

In February 1986, after CSI's fourth notice of deficiency, EPA Region IV recommended that North Carolina consider terminating CSI's interim status, as provided for by RCRA regulations, should CSI submit another inadequate trial burn plan in its application. Despite continued deficiencies in the permit application, North Carolina did not terminate the interim status because the resubmitted trial burn plan was acceptable.

EPA Region IV also recommended that the state take formal enforcement action, including an administrative order and a substantial penalty. In July 1986 North Carolina issued CSI an administrative order (with a fifth notice of deficiency) under which CSI agreed to a schedule to submit the necessary information for its application, make necessary facility modifications, and conduct a trial burn. However, the order did not include a penalty because North Carolina determined that the order was a strong enough enforcement action to obtain an acceptable permit

application from CSI. The order was amended a year later to accommodate a delay of about 1 month. Finally, CSI met the conditions of the order and conducted a trial burn on October 21 and 22, 1987.

Under RCRA, EPA could have taken enforcement actions, including termination of CSI's interim status, if it had determined that North Carolina was not taking timely and appropriate enforcement actions. RCRA required EPA to take certain formal action in such matters, including proper notification to the state. However, EPA Region IV determined that North Carolina was making an adequate effort to expedite CSI's complicated application. Therefore, EPA Region IV did not pursue any formal action toward this end and allowed North Carolina to continue its permitting approach for CSI. According to the EPA Region IV RCRA compliance chief, EPA did not exert any additional pressure on North Carolina to expedite approval or denial of CSI's application. In the 1984 amendments to RCRA, the Congress had mandated that EPA place a higher priority on permitting land disposal facilities than on permitting incinerators.

RCRA required that all permit applications for incinerators in existence in November 1980 be either approved or denied by November 1989. EPA was informed and involved in CSI's application throughout the permit process. Each of EPA's biannual evaluations of North Carolina's RCRA program since at least 1986 included a review of North Carolina's progress on and plans for permitting incinerators. Records show that North Carolina consulted with EPA in writing at least 32 times regarding disposition of CSI's permit application.

According to an August 1986 EPA study that evaluated the incinerator permitting process, delays and application deficiencies were not unusual at the time of CSI's application. The average processing time for existing incinerators was about 729 days and was predicted to increase as the number of applications increased. The processing time was even longer for commercial incinerators, such as CSI. Also, applicants usually received several (a minimum of two) notices of deficiency throughout the process because of the complexity of the required trial burn plan. At the time of the study, only 25 (about 10 percent) of the existing 235 incinerators nationwide had received RCRA permits. The delays occurred because of the regulations, numerous reviews and revisions of permit application, a large permit work load, and a priority for permitting land disposal facilities. As of December 1991, four hazardous waste incinerators remain under interim status nationwide.

According to the July 1990 RCRA Implementation Study on EPA hazardous waste permitting, the average permit processing time for incinerators is 4-1/2 years for issuance of a permit and 4 years for denial. North Carolina processed CSI's incinerator application in about 5-1/2 years.

Legal disputes between CSI and Caldwell County, the owner of the facility, also impeded the processing of CSI's permit application. In December 1987 the county attempted to withdraw its name from CSI's application. With the validity of the application in question, North Carolina agreed to delay action on the application until CSI's dispute with the county was resolved. The dispute was resolved in April 1988, when CSI agreed to close the incineration portion of the facility. However, CSI amended its permit application in June 1988 to reflect the changes in operation, requiring the state to reprocess the application. North Carolina was still processing the amended application in late 1989, when the county took legal action against CSI to close it entirely.

Even with the processing time of 5-1/2 years, CSI's permit application progressed in advance of most incinerators in EPA Region IV. CSI conducted its trial burn in 1987, a major milestone in the incinerator permitting process, while most Region IV incinerators were not scheduled to do so until 1988.

Air Quality Permitting

Under North Carolina regulations, potential air polluters are required to obtain an air quality permit. North Carolina issued six successive permits for CSI's incinerator from March 1977 until May 1988, specifying the permitted operating parameters and emissions limitations. At all times during the operation of its incinerator, CSI had a valid permit or a pending permit application, as required by state regulations. Each new permit included additional provisions to address changes in the incinerator's operation or changes in the state's compliance monitoring requirements.

Furthermore, North Carolina imposed several requirements on CSI that were more stringent than the applicable state clean air regulations. Some requirements in CSI's air quality permits were similar to RCRA incinerator permit requirements. For example, as of January 1985, North Carolina required CSI to operate a continuous temperature monitor and to take steps to limit hydrogen chloride and certain metal emissions. Since CSI was granted interim status under RCRA, it was not subject to RCRA permit standards. Nonetheless, CSI agreed to comply with these RCRA-type permit requirements.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.	Peter F. Guerrero, Associate Director Gerald E. Killian, Assistant Director Ned L. Smith, Assignment Manager
Atlanta Regional Office	Jerry W. Coffey, Regional Management Representative Octavia V. Parks, Evaluator-in-Charge Harold D. Perkins, Evaluator James B. Michels, Evaluator

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