

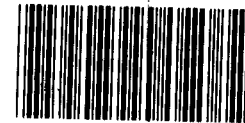
GAO

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

January 1993

CHEMICAL WEAPONS DESTRUCTION

Issues Affecting Program Cost, Schedule, and Performance



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**National Security and
International Affairs Division**

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January 21, 1993

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

Dear Mr. Chairman:

This report responds to your request that we review certain aspects of the Department of the Army's Chemical Stockpile Disposal Program. This report discusses (1) operational difficulties the Army has had at its prototype disposal facility on Johnston Island in the Pacific Ocean and (2) problems the Army is having obtaining environmental permits to construct and operate disposal facilities.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies to the Chairmen of the House and Senate Committees on Armed Services and on Appropriations, the Secretaries of Defense and the Army, the Director of the Office of Management and Budget, and other interested parties.

This report was prepared under the direction of John Henderson, Assistant Director, Army Issues, who may be reached on (202)275-4136 if you or your staff have any questions. Major contributors to this report are listed in appendix I.

Sincerely yours,

Henry L. Hinton, Jr.
Director, Army Issues

Executive Summary

Purpose

In 1985, Congress directed the Department of Defense (DOD) to destroy most of the U.S. stockpile of lethal chemical weapons and agents in a way that would maximize both environmental protection and public safety. DOD plans to spend almost \$8 billion to construct and operate specially designed, high-temperature incineration facilities on Johnston Island in the Pacific Ocean and at eight locations in the continental United States. The Chairman of the Subcommittee on Environment, Energy and Natural Resources, House Committee on Government Operations, asked GAO to review (1) the results of initial incineration tests on Johnston Island and (2) DOD's efforts to obtain required environmental permits.

Background

Chemical weapons contain agents that can blister the skin, disturb the central nervous system, and, in some instances, cause death. The chemical agents that the Army plans to destroy include nerve agents GB and VX and the blister agents commonly called mustard gas. In Public Law 99-145, Congress directed that the destruction program be completed by September 30, 1994. After being notified by the Army that operational changes and unexpected problems would delay completion of the program, Congress has subsequently extended the completion date on three occasions, most recently to December 31, 2004. Total program costs have increased from an initial estimate of \$1.7 billion to a current estimate of almost \$8 billion. This estimate includes program costs through December 2000. The Army has not yet determined the impact of the program extension to December 2004.

In fiscal year 1988, the Army completed construction of its prototype chemical weapons incineration facility on Johnston Island. Congress specified in Public Law 100-456 that operational verification tests should be completed at the Johnston Island facility prior to the start of full-scale disposal operations. The tests are divided into four parts, which the Army refers to as campaigns, three of which have been completed.

Results in Brief

GAO's review of test results from the Johnston Island facility shows lower than anticipated destruction rates resulting from reliability problems with destruction equipment. This could mean the destruction program will take longer than planned and exceed cost estimates. The overall average hourly rate of rocket destruction improved substantially from the first to the second campaign, but extensive maintenance downtime continued to slow operations.

GAO's work also shows that public concerns about the safety of chemical weapons incineration have caused several states to either implement or consider implementing legislation that could hinder or even prevent the issuance of required permits and the construction of the proposed incineration facilities. In response to the public concern and state legislative action, the Army, in October 1991, started a study to identify and evaluate the possible use of alternative technologies for destruction of chemical weapons and agents.

The Army has also continued to encounter difficulties in obtaining the required environmental permits. Congress recently extended the mandatory completion date of the disposal program by more than 5 years and postponed funding decisions for future incineration facilities until the results of the alternative technology study are known. This additional time will give the Army an opportunity to take full advantage of lessons learned from previous environmental permitting experiences while revising schedules and program plans.

Principal Findings

Operational Verification Test Results Have Improved but Destruction Rates Are Lower Than Anticipated

Performance of the Army's high-temperature incineration facility improved from the first to the second campaign. For each scheduled hour of operations, the Johnston Island prototype facility destroyed an average of 5 GB rockets in the first campaign and, based on GAO calculations, about 12 VX rockets per hour in the second campaign. However, average hourly destruction rates did not meet the overall goal of 13 rockets per hour. In addition, the facility was able to destroy only 17 rockets per hour, or about 70 percent of the planned rate of 24, during the full production phase of the second campaign.

The Army failed to achieve its desired destruction rates because of unplanned and unscheduled maintenance downtime problems, which occurred on an almost daily basis. GAO found that, due to equipment reliability problems, the prototype equipment did not operate at all for 32 of 105 days during which testing was scheduled.

Shortfalls in destruction rates could impact the destruction program since the Army continues to base operating schedules and cost estimates on the assumption that future sites will operate 24 hours per day at estimated

hourly destruction rates. The estimated rates are significantly higher than those demonstrated during verification testing. Army program officials stated the Army will likely revise its schedules and cost estimates, but not until the results of the fourth campaign are known in February 1993.

Public Opposition Might Prohibit Issuance of Required Permits and Incinerator Construction

Safety concerns and opposition to chemical weapons incineration have led Kentucky, Indiana, Maryland, and Colorado to either enact or consider enactment of legislation that could delay or even prevent construction of chemical weapons incinerators. Army officials said that these laws could significantly delay or even prevent construction and operation of high-temperature incinerators at these locations. Recognizing these potential difficulties, the Army asked the National Research Council to study possible alternative technologies for destroying the chemical weapons stockpile. Moreover, in its 1993 Defense Authorization Act, Congress directed the Army to adopt a destruction methodology other than incineration for the three storage sites with the smallest percentage of the chemical weapons stockpile — Lexington, Kentucky; Newport, Indiana; and Aberdeen, Maryland — if such an alternative method is significantly safer, equally cost-effective, and would likely result in completion of the program by December 31, 2004. In addition, Congress prohibited site preparation for, or construction of, future incinerators, including the proposed Anniston, Alabama, facility, until the results of the alternative technology study are reported to the Congress in December 1993.

Management of the Environmental Permit Process Can Be Improved

In its past management of the disposal program, the Army (1) underestimated the amount of time it would take state regulatory agencies to review and approve environmental permit applications, (2) did not adequately prioritize the importance of the chemical stockpile disposal program to state permit reviewers, and (3) relied on expedited approval techniques that might not be possible in the future due to increased public awareness and opposition to high-temperature incineration. For example:

- Army schedules generally allow 2 years for the processing of permit applications. However, based on GAO's conversations with state officials, the total time required for receipt of permits to construct the Anniston and Pine Bluff facilities will likely exceed 3 years.
- The Army has not effectively worked with state regulatory agencies to establish chemical weapons destruction program permit applications as a processing priority. Unless they are informed that work on a particular

application should be prioritized, state officials process permit applications in the order received. As a result, permit approval lags.

- The Army began incinerating munitions at the Johnston Island facility under a temporary authorization and initiated preliminary construction at the Anniston site before receiving a permit or soliciting prior public comment and scrutiny. According to some state officials, it is unlikely that expedited approval techniques will be available to the Army in the future.

Recommendations

The Army continues to experience problems with its chemical stockpile disposal program. Issues that remain relate to revision of cost estimates to reflect actual test experience, inclusion of 24 hour-a-day operations during operational verification testing, and the setting of work priorities for states to follow in reviewing hazardous waste permit applications. To address these problems, GAO recommends that the Secretary of the Army

- revise program cost estimates and operating schedules to reflect actual experience gained from operational verification testing;
- extend Johnston Island operational verification tests to include 24 hour-a-day operations to provide information on planned 24 hour-per-day destruction operations; and
- establish clearly defined work priorities for state permit reviewers to follow in those states having other hazardous waste permit applications in process for DOD programs.

GAO makes other recommendations to the Secretary of the Army in chapters 2 and 3 that are designed to improve the administration of the disposal program.

Agency Comments

As requested, GAO did not obtain official agency comments on this report. However, GAO discussed its findings with agency officials, who generally agreed with GAO's findings. Their views are included where appropriate.

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Abbreviations

DOD	Department of Defense
GAO	General Accounting Office
EPA	Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act

Introduction

In 1985, Congress passed Public Law 99-145, which directed the Department of Defense (DOD) to destroy most of the U.S. stockpile of chemical weapons and agents. Congress initially directed that the program should be completed by September 1994. In two subsequent laws, Public Law 100-456 and Public Law 102-190, Congress extended the deadline to 1997 and 1999, respectively, after being advised by the Army that revised construction schedules, difficulties at the Johnston Island prototype facility, and environmental permit processing extensions would delay completion of the program. In its 1993 Defense Authorization Act, Congress extended the destruction completion date to December 31, 2004.

The chemical weapons to be destroyed contain three types of lethal agents: GB, VX, and H. GB and VX are nerve agents that disrupt the nervous system and usually cause death. The H series of agents, commonly called mustard gas, blister the skin and can lead to death if one is exposed to large doses. These agents are loaded into various munitions, including rockets, bombs, mines, and projectiles. Agents are also stored in bulk in 1-ton containers and spray tanks. Currently, the items are stockpiled at eight locations in the continental United States and on Johnston Island in the Pacific Ocean. Table 1.1 provides a breakdown of the U.S. chemical weapons stockpile by storage location.

Table 1.1: Profile of U.S. Chemical Weapons Stockpile (percents are rounded)

Storage location	Percent of total	Bulk agent	M-55 rockets	Mines	Spray tanks	Projectiles and cartridges	Bombs
Aberdeen, Maryland	5	H					
Anniston, Alabama	7	H	GB and VX	VX		H, GB, and VX	
Johnston Island	7	H, GB, and VX	GB and VX	VX		H, GB, and VX	GB
Lexington, Kentucky	2	GB	GB and VX			GB and VX	
Newport, Indiana	4	VX					
Pine Bluff, Arkansas	12	H	GB and VX	VX			H
Pueblo, Colorado	10						H
Tooele, Utah	42	H, GB, and VX	GB and VX	VX	VX	H, GB, and VX	GB
Umatilla, Oregon	12	H	GB and VX	VX	VX	GB and VX	GB

In fiscal year 1988, the Army completed construction of the first full-scale chemical weapons disposal facility, which is located on Johnston Island. Based on a risk analysis of national, regional, and on-site destruction options, the Army announced in 1988 that destruction of the munitions by high-temperature incineration at each of the continental U. S. storage sites was the best and safest method.

Before beginning construction and operation of any destruction facility, the Army must obtain federal and state environmental permits that specify detailed designs and allowable operating parameters. Subsequent changes to the facility must be incorporated into the permits through formal change procedures.

Incineration Process

The destruction of chemical weapons is a three-step process. First, weapons are disassembled by machines that separate the agents and explosives from the munitions' bodies. Second, each weapon component is incinerated in one of four specially designed incinerators. These include the liquid incinerator for destroying the chemical agent, the deactivation furnace for destroying explosive materials, the metal parts furnace for decontaminating the projectile and bulk container bodies, and the dunnage incinerator for destroying trash created by operations. Finally, a pollution abatement system cools and scrubs the exhaust gases of each incinerator and removes particles so that the gases can be safely released into the atmosphere.

Our Prior Concerns With the Army's Disposal Program

In prior reports and testimony, we expressed concern about the Army's chemical stockpile disposal program. For example:

- In a May 1990 report, we concluded that the program costs would likely continue to escalate and that the Army would probably not meet the then congressionally mandated completion date of April 30, 1997.¹
- In a July 1990 report, we concluded that the Army would experience further delays at the Johnston Island facility and that costs would continue to increase.²
- In a November 1991 report, we stated that continued problems in the Army's disposal program indicate that increased costs and additional time to destroy the chemical stockpile should be expected. We recommended that the Army determine whether faster and less costly technologies are available for destruction of the chemical stockpile.³
- In June 1992 testimony before the House Subcommittee on Environment, Energy and Natural Resources, Committee on Government Operations, we

¹Chemical Weapons: Obstacles to the Army's Plan to Destroy Obsolete U.S. Stockpile (GAO/NSIAD-90-155, May 24, 1990).

²Chemical Weapons: Stockpile Destruction Delayed at the Army's Prototype Disposal Facility (GAO/NSIAD-90-222, July 30, 1990).

³Chemical Weapons: Stockpile Destruction Cost Growth and Schedule Slippages Are Likely to Continue (GAO/NSIAD-92-18, Nov. 20, 1991).

stated that (1) temporary and special authorizations enabled the Army to expedite some of its disposal program activities; (2) restrictive state legislation could jeopardize program schedules; (3) some of the requested fiscal year 1993 funding for the Anniston, Alabama, and Lexington, Kentucky, sites is based on unrealistic permit approval schedules; and (4) equipment reliability problems could contribute to future cost growth.⁴

In the conference report accompanying the fiscal year 1993 Defense Appropriations Act, Congress deleted construction funding requested for the Anniston facility totaling \$95.3 million and procurement funding totaling \$9.8 million for the Lexington facility. In the fiscal year 1993 Defense Authorization Act, Congress directed the Army to complete a study of possible alternative technologies that could be used for chemical weapons destruction. Congress specified that the study should be completed by December 31, 1993.

Management Organization of the U.S. Army Chemical Materiel Destruction Agency

At the direction of the House Appropriations Committee, in June 1992, DOD established a single organization to manage all chemical warfare destruction activities. The U.S. Army Chemical Materiel Destruction Agency is responsible for destroying all chemical warfare related items, including the chemical weapons stockpile, chemical agent contaminated containers, old chemical warfare production plants, lethal wastes from past disposal operations, buried and range recovered munitions, and binary weapons facilities.

The agency, led by a general officer, consists of two program management offices. The Program Manager for Chemical Demilitarization is responsible for destroying the chemical weapons stockpile. The Program Manager for Nonstockpile Chemical Materiel is responsible for identifying and assessing sites with possible buried chemical weapons, coordinating the transportation of recovered weapons to sites where they can be stored pending destruction, destroying all items contaminated with chemical agents that cannot be safely transported, and developing preliminary plans for destruction of former chemical weapons production facilities.

⁴Chemical Weapons Destruction: Issues Related to Environmental Permitting and Testing Experience (GAO/NSIAD-92-43, June 16, 1992).

Status of International Chemical Weapons Destruction Agreements

The Army has actively supported and attempted to schedule its destruction program completion to coincide with provisions of draft chemical arms reductions treaties. In 1990, the United States and the former Soviet Union signed a bilateral agreement whereby the two countries would concurrently eliminate stockpiles of chemical agents and munitions. The United States also supports a draft multilateral agreement that would establish a global ban on chemical weapons stockpiles. President Bush, in May 1991, stated that the United States would destroy its chemical weapons stockpile 10 years after the multilateral agreement becomes effective.

Only the United States, the former Soviet Union, and Iraq have publicly disclosed the existence of chemical weapons stockpiles. Reportedly, nearly all of the former Soviet Union's chemical weapons are stored within the Russian Republic and the Russian President has stated that his nation will comply with the terms of the agreement with the United States. The Russians have not yet decided on a destruction technology.

An Army official noted that lack of progress by the Russians and the absence of a ratified international chemical weapons treaty will not slow U.S. efforts to destroy its stockpile. The United States is committed to destroying chemical weapons and will proceed unilaterally.

Environmental Permit Requirements Must Be Met Before Construction Can Begin

The Army must obtain hazardous waste and air emission permits from each of the states with proposed incineration sites before beginning construction. These permits specify construction parameters and, once the facility is built, establish operating guidelines and emission limitations. The Army must also comply with the provisions of the National Environmental Policy Act, which requires assessment of the environmental impact of the proposed disposal operation.

The Resource Conservation and Recovery Act (RCRA) of 1976 (Public Law 94-580) establishes guidelines for the treatment, storage, and disposal of hazardous wastes. The physical construction of a new hazardous waste management facility cannot begin without a RCRA permit. Review and approval authority for RCRA permit applications has been delegated by the Environmental Protection Agency (EPA) to most state regulatory agencies. The EPA regional office in San Francisco is responsible for monitoring the environmental compliance of the prototype facility on Johnston Island.

Under the Clean Air Act, an applicant must obtain permits outlining the manner in which air emission standards will be met. In seven of the eight states where disposal facilities are planned, the air permits are issued separately by the state. In Maryland air permit requirements are incorporated into requirements for the RCRA permit.

RCRA Permit Process

RCRA permit applications provide general facility information, such as chemical and physical analyses of waste to be managed, security procedures, quality control procedures, waste storage plans, a contingency plan listing procedures during emergency operations, and other operational support data. The application also includes specific incineration information, such as data on the demonstration of performance standards at specific operating conditions, particulate emissions limits, monitoring procedures, and trial burn schedules. As a result of the extensive and detailed permit application requirements, the application packages are usually very lengthy. The Tooele RCRA documentation, for example, consisted of 14 volumes of data.

The RCRA review process generally begins when an application is submitted to the state agency responsible for reviewing and approving the permit. The state's initial review of the application generally results in a notice to the applicant specifying deficiencies in the application. The applicant must then revise and resubmit the application addressing each of the deficiencies. This process continues until the state determines that the application is complete and acceptable. A draft permit is then prepared by the state and is sent to the federal EPA and its applicable regional office for comments.

After incorporating EPA's comments, the state finalizes the draft permit and issues a public notice of intent to issue a RCRA permit. There is a public comment period of 45 days and a public hearing is held if requested by any concerned citizen. If there is a hearing, an additional public comment period of 15 days must be provided. The state then finalizes the permit and issues a notification of intent to issue a permit authorizing the start of construction. The permit is not effective until 30 days after the notification of intent is issued. During this period, the public can appeal the pending issuance of the permit. EPA and state time estimates for this review process range from 16 to 36 months, depending on the complexity of the permit, state resource limitations, and any appeals of the permit decision. However, Army program schedules generally assume that the process can be completed within 24 months.

Hazardous waste facility operators can begin construction once they receive RCRA and air permits. If the operator makes any changes during construction that affect the facility's approved design and operating conditions, the operator cannot begin processing hazardous waste until the modifications are reported to the regulatory agency. While some minor changes may be implemented prior to formal approval by the state regulatory agency, more extensive modifications may not be implemented without prior approval, which usually includes solicitation and consideration of public comments at public informational meetings and hearings.

After a facility is constructed and modification requests, if any, are approved by regulatory officials, the operator begins a shakedown period involving limited facility operations. This period allows limited burning of wastes to help stabilize a new facility's operations. When the shakedown period is over, operators must demonstrate compliance with performance standards set in the permit during an EPA-monitored performance test called a trial burn. The conditions under which the incinerator actually operates during the trial burn are used to set final permit operating conditions. The facility must then maintain these specified operating conditions at all times when burning hazardous wastes.

Air Permit Process

To comply with the Clean Air Act Amendments of 1977 (Public Law 95-95) and state implementation plans, the Army must obtain permits for air pollution control prior to constructing and operating any destruction facility. The states are expected to process the air permit application concurrently with the RCRA permit application. The Army's program schedule assumes the process can be completed in 15 to 24 months.

The air permit process is composed of two stages. In the first stage, before any construction takes place, the applicant submits an application, which includes detailed information on the type of facility, process, expected emissions, and air pollution control equipment. Typically, the state reviews the application and, if it is initially approved, the state notifies the public of its intent to approve the application, requests public comments, and possibly holds a public meeting. After making any permit changes resulting from the public comments, the state notifies the public of its intent to issue a construction permit. The public then has an interval during which anyone can contest the issuance of a permit. The merits of this challenge are evaluated by a hearing or legal proceeding and the state either issues or denies a permit.

Once the facility is built, the state inspects it to verify that it was built as described on the construction permit. The state then issues a permit to operate. The state continues to have the authority to inspect these facilities, including emission testing, to ensure compliance.

In 1990, Congress passed amendments to the Clean Air Act requiring a wide variety of new regulations. Until EPA and the states promulgate these new regulations, it is difficult to tell how the amendments will affect the chemical stockpile disposal program. However, Army program management officials have acknowledged that new requirements could possibly increase implementation time frames for the program.

Assessment of Environmental Impact From On-site Destruction

The National Environmental Policy Act of 1969 (Public Law 91-190) requires the Army to develop an environmental impact statement on the environmental effects of destroying the chemical stockpile. Public Law 99-145 also requires the Army to compare the advantages and disadvantages of three disposal options: destruction at each existing storage location, regional centers, or a single national disposal center. Since the chemical stockpile disposal program could affect 20 different states if munitions were transferred between storage sites, the impact was initially assessed in 1986 on a "programmatic" basis—taking into account the collective impact of all disposal sites. In response to public comments, the Army also assessed the risk of relocating stockpiles from Lexington, Kentucky, and Aberdeen, Maryland, two sites surrounded by densely populated areas, and on-site disposal at the other six sites.

Because federal regulations implementing the National Environmental Policy Act also require the Army to consider a no-action alternative, the Army studied the risks of continued storage of the chemical munitions. However, continued storage was not considered a viable option given Public Law 99-145, which also required the destruction of the stockpile.

A draft of the programmatic impact statement was provided to the public and various federal, state, and local government entities, and the Army addressed pertinent comments received. In February 1988, citing difficulties related to ensuring the health and safety of persons living close to proposed transportation routes, the Army announced, in a formal record of decision, that it planned to build and operate incinerators at the eight chemical weapons storage sites. The Army selected on-site destruction as the preferred alternative because it posed the least risk to public health and the environment. Also, the Army believed that on-site

disposal posed the least risk of sabotage and terrorism and provided the greatest benefits for enhanced emergency preparedness.

Before beginning construction at any site within the continental United States, the Army plans to update and verify detailed environmental information specific to that site and compare it to the data gathered during the programmatic study. The Army also plans to prepare draft site-specific environmental impact statements for each site and provide opportunities for review and comment by federal, state, and local government agencies as well as the general public. Finally, the Army plans to issue a formal record of decision and certify that the original programmatic decision continues to be the preferred destruction alternative after full consideration of updated site-specific information. To date, site-specific assessments, including formal records of decisions, have been completed for two of the eight proposed continental U.S. sites, and, at these sites (Tooele, Utah, and Anniston, Alabama), on-site incineration remains the Army's preferred alternative.

DOD Plans for Destruction of Disposal Facilities

The law mandating destruction of the chemical stockpile, Public Law 99-145, also mandated the dismantling and disposal of facilities constructed to carry out the destruction program. In compliance with Public Law 99-145, the Army plans to clean, dismantle, and dispose of the facilities after the demilitarization program is completed.

In 1991, the Army estimated that program closure costs would total \$53 million. That estimate increased to \$324 million by 1992. The reason for the increase is that the first cost estimate was based on incomplete and preliminary information on the exact requirements for closure. The 1992 estimate includes the cost for decontaminating the demilitarization equipment and the plant, disassembling the equipment, removing it, and closing the plant, but does not include costs for the actual destruction of the buildings. The Army is currently conducting studies to determine how much this will cost.

Cost Growth Continues to Be a Problem

The Army's cost estimates for destruction of chemical weapons have increased by \$6.2 billion since 1985, when early programmatic estimates were made. In 1985, using preliminary information, the Army estimated costs for the program at \$1.7 billion. In 1992 hearings before the House and Senate Appropriations Committees and the Subcommittee on Environment, Energy and Natural Resources, House Committee on

Government Operations, the Army reported that program cost estimates totaled \$7.9 billion and costs would likely continue to escalate. This estimate includes program costs through December 2000. The Army has not yet determined the cost for extending program completion to December 2004.

Objectives, Scope, and Methodology

At the request of the Chairman of the House Subcommittee on Environment, Energy and Natural Resources, Committee on Government Operations, we reviewed (1) the results of initial incineration tests on Johnston Island and (2) DOD's efforts to obtain environmental permits at its eight chemical stockpile storage locations in the continental United States and on Johnston Island.

At the Army's Chemical Materiel Destruction Agency in the Edgewood Area of Aberdeen Proving Ground, Maryland, we interviewed program management officials, obtained documentation on the status of environmental permits at each of the nine sites, and analyzed testing data from the Johnston Island facility, including reports prepared by the Army's independent oversight contractor.

We talked to state environmental officials from each of the eight U.S. continental disposal sites and representatives of citizen opposition groups in five of the states where organized citizen groups have been formed. We obtained their perspectives on the accuracy of the Army's schedule and the extent to which current or proposed state laws or regulations could significantly impact program implementation.

At the federal level, we contacted responsible EPA regional officials. We also discussed the program with Center for Disease Control officials in Atlanta, Georgia.

Our review was conducted from August 1991 to October 1992 in accordance with generally accepted government auditing standards. As requested, we did not obtain fully coordinated DOD comments on this report. However, we discussed our findings with Army and DOD program management officials and have included their comments where appropriate.

Operational Verification Test Results Have Improved but Destruction Rates Are Lower Than Goals

Congress directed the Army to conduct operational verification tests at the Johnston Island prototype facility to verify the safety and reliability of high-temperature incineration equipment. Our review of the Army's and its oversight contractor's operational verification test data shows that

- the prototype incineration facility generally operated safely and within environmental rules and regulations;
- equipment reliability improved from the first to the second campaign, but average hourly destruction rates were less than expected;
- the Army and its oversight contractor applied inconsistent evaluation methodology, which resulted in overstated destruction rates;
- equipment reliability problems and maintenance downtime continued to slow the rate of weapons destruction;
- the Army has not yet updated program operating schedules and life-cycle cost estimates to reflect actual testing experience; and
- independent assessment reports from the oversight contractor could be more timely.

Operational Verification Test Objectives and Goals

In 1988 Congress directed in Public Law 100-456 that operational verification tests should be completed on Johnston Island before the start of full-scale disposal operations at stateside facilities. These tests were intended to (1) verify that reverse assembly high-temperature incinerators can safely destroy chemical munitions and bulk agents while meeting applicable state and federal environmental regulations and (2) assess the reliability of the mechanical process. Initially, the Army estimated that it would need 16 months to complete the congressionally mandated test. Current estimates indicate that the test program will be completed over a 32-month period.

The operational verification tests are divided into four campaigns:

- The first campaign, started in July 1990 and completed in February 1991, destroyed GB-filled M-55 rockets and included a trial burn of the liquid incinerator.
- The second campaign, started in November 1991 and completed in March 1992, destroyed VX-filled M-55 rockets and included a trial burn of the deactivation furnace and a follow-up trial burn of the liquid incinerator.
- The third campaign, started in August 1992 and completed in September 1992, tested the destruction of mustard-filled 1-ton containers and included a trial burn of the metal parts furnace.

- The fourth campaign, started in October 1992 and scheduled to end in February 1993, is testing the destruction of mustard-filled projectiles. This campaign also includes a planned trial burn of the dunnage incinerator near the end of the final operational verification campaign.

The Army hired an independent contractor to develop testing guidelines to independently assess and verify the results of its operational verification test program. In March 1989, the Army and the contractor published an operational verification test plan, including a list of average hourly destruction rate goals, that was to be used to assess the reliability of the high-temperature incineration equipment. The plan stated that average hourly destruction rates would be determined by dividing the actual number of items destroyed by the scheduled operating hours.

The contractor and the Army established overall and interim destruction rate goals for each campaign. Interim goals reflected the assumption that rates would improve as staff gained operating experience and start-up mechanical problems were resolved, until the facility was working at full capacity. For example, in the scheduled 4-month VX rocket destruction campaign, the Army expected to destroy 8 rockets per hour during the first 2 months, 12 rockets per hour during the third month, and 24 rockets per hour (the full operating rate) during the final month. For the overall VX campaign, the Army expected to destroy rockets at an average rate of 13 per hour.

In addition, to compensate for the problems associated with operating the Johnston Island facility in such a remote location, the contractor set the full-rate goal at 75 percent of the destruction rate anticipated for stateside facilities. Using the VX campaign example, the Army expected to destroy 24 rockets per hour at full capacity compared to a stateside goal of 32.

Operational Verification Tests Demonstrate Safe Operations

The independent oversight contractor's assessment reports for the first and second test campaigns concluded that the high-temperature incineration equipment operated safely and with no adverse impact on the environment. In addition, the results of trial burn tests monitored by EPA were in accordance with environmental permit requirements.

For example, during the second verification campaign, trial burns were conducted for both the liquid agent and deactivation furnaces. A trial burn consists of four separate demonstration burns conducted over a 4-hour period. Representatives from EPA observed each trial. The results were

that for each trial burn (1) no chemical agent was detected in the pollution abatement system exhaust stack; (2) at least 99.99 percent of the agent was destroyed, as required by the environmental permit; and (3) particulate emissions were below allowable concentration levels.

While no one was injured from exposure to chemical agents during the first and second campaigns, the Army investigated two possible releases of chemical agent through the common pollution abatement system exhaust stack. For the first campaign, the contractor reported, and the Army acknowledged, a release of chemical agent GB that was determined to be 22 percent of the EPA allowable release concentration.

During the second campaign, the agent monitoring and alarm system, on February 17, 1992, indicated that VX agent vapors may have been present in the pollution abatement system exhaust stack approximately 19 percent over the EPA allowable concentration level. The Army could not confirm or definitively refute the presence of the agent in the exhaust stack through backup air monitors because the air sample collection tubes had been removed under the normal exchange procedures at the time of the agent alarm. The Army concluded in its post-incident investigation that the alarm was probably caused by some other substance, such as products of incomplete fuel combustion because (1) no rockets had been introduced into the system for nearly 6 hours preceding the alarm; (2) at the time of the alarm, the afterburner was at operating temperature; and (3) incompletely burned fuel products have caused false monitoring alarms in the past. The Army, however, was unable to identify the chemical compound that caused the incident.

**Operational
Verification Tests
Demonstrate
Improved
Performance but
Destruction Rates
Were Lower Than
Expected**

Performance of the Army's Johnston Island prototype incineration facility improved from the first to second campaign. During the second campaign, based on our analysis, the facility destroyed an average of 12 VX-filled rockets per hour, slightly less than the Army's goal of 13 rockets per hour. These results represent a substantial improvement when compared to the average destruction rate of five GB-filled rockets per hour achieved during the first campaign. In addition, the total number of rockets destroyed increased from 7,490 during the first campaign to 13,889 during the second.

The Army almost met overall test goals. However, it was less successful during the final phase of the second campaign when it had hoped to operate at full rate. During this phase, the Johnston Island facility

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destroyed an average of 17 rockets per hour, compared to a goal of 24 rockets per hour. The facility also fell short of operating time goals by operating only 65 percent of scheduled hours compared to a goal of 75 percent.

Table 2.1 compares the test goals to processing rates and operating times computed by us for the second VX rocket destruction campaign.

Table 2.1: VX Rocket Campaign Test Results

Campaign phase	Rockets destroyed per hour		Percentage of hours operating each working day	
	Goal	Actual	Goal	Actual
Phase 1 (at reduced rate) Nov. 15, 1991, to Jan. 9, 1992	8	11	25	43
Phase 2 (at reduced rate) Jan. 10, 1992, to Feb. 6, 1992	12	7	37	25
Phase 3 (at full rate) Feb. 7, 1992, to Mar. 24, 1992	24	17	75	65
Overall test	13	12 ^a	43	46 ^a

^aThe overall test results are derived from total accomplishments in all three phases. They are not an average of the three phases.

The Army and Its Oversight Contractor Used Inconsistent Methodologies to Compute Destruction Rates

We believe the methodology used by the Army and its independent oversight contractor overstated destruction rates achieved during the second operational verification campaign. For example, the contractor's August 1992 draft assessment report cites an average overall destruction rate of 19.6 rockets per hour for the second campaign. However, the methodology the contractor used to compute the rate is not consistent with the initial test plan or the methodology used to calculate destruction rates for the first verification campaign. Using this initial methodology, we determined that the average hourly overall destruction rate was 12.2 rockets per hour.

Differences in Methodologies

We determined the destruction rate in rockets per hour by dividing the total number of rockets destroyed by the time it took to process them. This methodology was consistent with the methodology used by the Army and the contractor. The methods differ, however, in the way the processing time was determined. Our analysis was (1) made in accordance with the destruction rate methodology specified by the initial operational

verification test plan published in March 1989; (2) similar to the method used by the Army in its preliminary report to the Subcommittee on Environment, Energy and Natural Resources; and (3) consistent with methodology used by the independent contractor to compute destruction rates for the first verification campaign.

The contractor's operational verification test plan states that destruction rates would be computed based on scheduled operating hours. During the first verification campaign, the rates were based on the total hours the plant was scheduled to operate. In contrast, for the second operational verification campaign, the contractor computed the rates based on only the days when the plant actually operated. To arrive at an overall average destruction rate of 19.6 rockets per hour for the second campaign, the contractor did not charge a minimum of 10 hours a day, even though the facility was scheduled to operate for that period. Instead, the contractor included only operating and maintenance downtime hours that occurred between the time the first rocket was disassembled each day until the final rocket was incinerated. This excluded a significant portion of unexpected maintenance downtime hours. For example, when the plant did not operate for an entire day, due to unexpected maintenance problems—which occurred 32 of the 105 processing days during the second campaign—no processing time was charged.¹

The Army's Program Office independently calculated a destruction rate using a methodology similar to the one we used. It arrived at a rate of 13.8 rockets per hour by dividing the number of rockets destroyed by the scheduled 10-hour operating day plus any actual operating times after the 10th hour. The Army, however, did not include downtime that occurred after the 10th hour. Program Office officials have since advised us that they believe the contractor calculation provides a better measure of overall performance.

To arrive at our destruction rate of 12.2 rockets per hour, we included, for each day, the time from when the first rocket was disassembled until the last rocket was incinerated in the deactivation furnace, with a minimum of 10 hours charged each day. This included any downtime that occurred throughout the entire processing day.

According to its draft report, the contractor changed methodologies because (1) the Army operated outside the scheduled 10-hour operating

¹Processing days exclude Sundays, holidays, days when processing was prohibited by unfavorable wind conditions, and days in which trial burns were conducted.

day and (2) the contractor captured the downtime in its availability statistics. A contractor official acknowledged that the methodology differs from the first to second campaign, but in their view the revised methodology is more reflective of destruction rates that can be expected when a plant is fully operational. The official explained that when the plant was operating, actual destruction averaged 19.6 rockets per hour.

We believe destruction rates should be computed on the basis of scheduled rather than operational hours. This approach is consistent with initial test plan guidance. Lower than anticipated destruction rates have been caused by extensive unexpected equipment breakdown. Since destruction at stateside facilities will be conducted 24 hours per day, computing destruction rates based only on operational hours—which excludes large portions of unexpected maintenance downtime—does not provide a meaningful basis for developing future destruction schedules and cost estimates. The Army's schedules and cost estimates for sustained operations are based on the average number of munitions expected to be destroyed during each scheduled hour of operations.

Extensive Maintenance Downtime Continues to Slow Destruction Operations

Destruction operations at Johnston Island were slowed due to unexpected maintenance problems, which occurred on an almost daily basis. During the last phase of the VX rocket campaign, when the prototype was operating at full rate, the Army demonstrated an equipment reliability rate of 65 percent, less than the campaign goal of 75 percent and considerably less than the 85 percent reliability rate predicted by the original equipment design contractor for normal processing of M-55 rockets. Because of these maintenance problems, the Johnston Island facility did not operate at all on 32 of the 105 scheduled processing days during the VX rocket campaign. Even after 44 weeks of both GB and VX M-55 rocket incineration experience, the prototype facility remained operational for the scheduled 10 hours less than 30 percent of the days during the full-rate (capacity) phase of the campaign.

The greatest single source of maintenance downtime during the second campaign was caused by an explosion in the deactivation furnace used to destroy explosive material. The system was shut down for 16 days to inspect and repair a 2-inch-by-8-inch hole in the furnace caused by the explosion. The explosion did not result in the release of chemical agents to the atmosphere, nor did it cause any injuries, and damage was limited to the furnace itself. An Army report, dated February 1992, concluded that the explosion was a low probability event that could be expected on an

infrequent basis. The Army recognized the potential for this problem before the explosion and had already decided to increase the thickness of the deactivation furnace wall in stateside facilities, making the furnace more resistant to detonations. In addition, the Army plans to retrofit the Johnston Island deactivation furnace with thicker walls.

Unexpected repair and maintenance of the fuse segregator conveyor in the rocket shear machine accounted for 6 of the 32 non-operational days during the early portion of the second campaign. Army program management officials told us recurring problems of this nature will be eliminated through revised operating procedures and computer software enhancements.

The Army Has Not Revised Program Schedules Based on Test Results

The Army continues to base life-cycle costs and schedules on estimated destruction rates that do not reflect actual demonstrated test results. The Army's current operating schedule and cost estimates are based on the assumption that future sites will operate 24 hours a day, including 3 hours for maintenance. During the Johnston Island operational verification tests, the destruction facility was scheduled for operations only 10 hours a day. The Army planned to do most of the routine maintenance during the remaining 14 hours of each working day.

An Army program management official told us that the Army may revise its operating schedules and life-cycle cost estimates, but not until after the completion of all four test campaigns. An Army study, completed in August 1991, indicates that overall life-cycle costs for the chemical stockpile disposal program will increase by an average of \$377 million if the actual sustained destruction rates are only 50 percent of the originally forecasted rates. Moreover, scheduled operating periods would be extended by an average of about 20 percent. To date, the Army's operational verification tests have demonstrated capability to destroy M-55 rockets at approximately 50 percent of the design rate.

Because the tests do not include a period of round-the-clock operations, Army officials told us they will rely on engineering judgments in extrapolating demonstrated results from 10 hour-per-day test operations to reflect what might be expected from sustained 24 hour-per-day operations.

Independent Oversight Report Not Timely

The Army hired an oversight contractor to independently assess the results of its operational verification test program. The contractor was expected to publish separate evaluation reports suitable for public distribution within 90 days of completion of each operational verification campaign.

The first assessment report describing results of the destruction of GB-filled M-55 rockets was published in June 1991, 3 months after completion of the campaign. Although the second campaign was completed in March 1992, a final evaluation report was not published until late November 1992. Army officials told us they commented on several draft versions of the report, but final publication was delayed in reaching agreement on the Army's final comments to the report.

Oversight reports are distributed to a wide range of interested groups, including state environmental permit reviewers. Public officials use the assessment reports in determining the suitability of incineration technology for use at other stateside locations. Therefore, we believe the Army and the contractor should endeavor to publish the information in a more timely manner.

Conclusions

The Army's current program schedules and cost estimates are probably optimistic because they do not incorporate actual destruction rates and downtime experienced during the operational verification campaigns for rockets. Moreover, methodologies used by the Army and its oversight contractor for computing destruction rates for the first and second campaign have not been consistent. Furthermore, because the Army's operational verification test plan does not include 24 hour-a-day operations, the cost estimates, operating schedules, equipment designs, and subsequent equipment purchases will not incorporate any lessons that might be learned from such sustained operations.

Recommendations

We recommend that the Secretary of the Army

- require that computation of destruction rates for the third and fourth campaigns reflect the criteria set out in the operational verification test plan;
- revise program cost and schedule estimates to reflect actual experience gained from operational verification testing;

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- extend Johnston Island operational verification tests to include 24 hour-a-day operations to provide information on what might be encountered during planned 24 hour-a-day destruction operations;
- defer future equipment acquisitions until the results of 24 hour equipment verification tests are completed and analyzed; and
- require that the oversight contractor publishes all future assessment reports in a timely manner.

Public Opposition and Environmental Permit Requirements Continue to Be a Concern

In response to public concerns about the safety of chemical weapons incineration, some states have passed legislation that could delay or even prevent construction of the proposed incineration facilities. Other states are considering similar legislation. Recognizing these potential difficulties, in October 1991, the Army began studying possible alternatives to high-temperature incineration. Congress recently extended the authorized completion date of the chemical stockpile disposal program 5 years, to December 31, 2004, and directed the Army to report on the results of its alternative technology study by December 31, 1993. As the destruction program continues to mature and new program schedules are developed to meet the extended program completion date, the Army should consider lessons learned from previous environmental permitting activities.

Our work shows that in the past the Army (1) underestimated the time state regulatory agencies would need to review and approve environmental permit applications, (2) did not adequately prioritize to state agency officials the importance of the chemical stockpile disposal program, and (3) relied on temporary permit authorizations and preliminary approvals that might not be approved in the future.

Public Opposition Might Prohibit Incinerator Construction

Public opposition to the Army's plan to construct chemical weapons incineration facilities has led Kentucky and Indiana to enact legislation that places additional, more stringent permit requirements on these facilities. Maryland and Colorado are considering similar legislation. These restrictions could delay or even prevent the Army from constructing incinerators in those states. Potential delays also exist if opponents of incineration opt to contest approval of environmental permits, citing the possible health and environmental hazards posed by incineration of chemical weapons.

In 1988, Kentucky enacted legislation that will require the Army to demonstrate the absence of any acute or chronic health or environmental effects from the incineration of chemical weapons before an environmental permit can be granted. Indiana passed similar legislation in 1992. Another Kentucky law, passed in 1992, requires state environmental officials to certify that incineration is the safest technology for destroying chemical weapons, considering the risks associated with transportation and disposal technologies currently in use as well as those still under development.

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Concern

Opposition is also present in other states. The Maryland legislature considered, but did not pass, a bill similar to those enacted in Kentucky and Indiana. A Maryland group opposing the Aberdeen incinerator hopes to have the same bill proposed again. Legislation proposed but not acted on in Colorado would have prohibited the state from accepting applications for hazardous waste incinerators until federal agencies study the effects of hazardous waste incinerators on people and animals.

Under RCRA, states can establish regulations more stringent than federal standards. Although the act is intended to minimize potential health hazards, some states want complete assurance of no long-term health effects. According to the Centers for Disease Control in Atlanta, Georgia, a 30-year epidemiological study of persons living in a community surrounding an incinerator would have to be conducted to adequately document and ensure that incinerator emissions do not cause cancer. Such requirements could therefore extend the destruction program indefinitely.

In addition to the more restrictive state legislation, citizen groups opposed to high-temperature incineration exist at each of the proposed chemical weapons disposal sites. Representatives from these groups collectively agreed to oppose the use of incineration for destruction of chemical weapons and also encouraged the Army to seek alternative chemical weapons disposal technology. Furthermore, some opposition groups told us that they plan to contest any environmental permit granted to the Army by a state agency.

The Army has acknowledged that state legislation could significantly delay or even prevent construction and operation of high-temperature incinerators in some areas. Recognizing these possible contingencies and considering the increased public opposition to high-temperature incineration, the Army, in October 1991, asked the National Research Council¹ to conduct a review of alternative technologies that might possibly be used for destruction of chemical weapons and agents. The Council's report is expected to be released in November 1993.

In its fiscal year 1993 Defense Authorization Act, Congress directed the Army to submit a report on the results of its alternative technology assessment no later than December 31, 1993. Congress also directed that a destruction method other than high-temperature incineration must be

¹The National Research Council was established by the National Academy of Science in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and of advising the federal government.

used for the disposal of chemical stockpile material currently stored at Lexington, Kentucky, Aberdeen, Maryland, and Newport, Indiana, if the alternative method is significantly safer, equally cost-effective, and would likely result in completion of the destruction program before December 31, 2004. Finally, in its fiscal year 1993 Defense Appropriations Act, Congress prohibited site preparation for, or construction of, additional chemical weapons incineration facilities, including the Anniston, Alabama, site, until the results of the Army's alternative technology assessment are known.

Longer Than Anticipated Times for Review and Approval of Permit Applications

State agencies in Alabama and Arkansas are taking longer than Army program officials anticipated to approve permit applications. One reason is that the states, without a clearly defined priority schedule, have decided to work on applications in the order received.

In a previous report, we concluded that the Army's schedule for obtaining environmental permits was too optimistic.² The Army disposal program schedules initially allowed 18 months for environmental permit application review and approval, based on EPA's estimates of RCRA application processing times. The current schedule allows approximately 2 years for processing. However, based on discussions with responsible state agency officials, review of both the Anniston and Pine Bluff applications is likely to take over 3 years.

Table 3.1 shows the Army's current program schedule for pending permit applications and expected dates for construction starts. In October 1992, Army program management officials advised us that these dates are currently under review and that updated schedules would be provided to Congress within the next few months.

²Chemical Weapons: Obstacles to the Army's Plan to Destroy Obsolete U.S. Stockpile (GAO/NSIAD-90-155, May 24, 1990).

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Table 3.1: Army's Stockpile Disposal Program Schedule for U.S. Sites

Site	Permit application submitted	Permit approval requested	Construction start (planned)	Operations start (planned)	Closure (planned)
Anniston	July 1990	May 1993	Aug. 1993	Oct. 1997	Dec. 2000
Umatilla	Oct. 1990	May 1993	Mar. 1994	May 1998	Jan. 2001
Pine Bluff	July 1991	June 1993	Mar. 1994	Mar. 1998	Dec. 2000
Pueblo	June 1992	Apr. 1994	July 1994	Sept. 1998	June 2000
Lexington	May 1992 ^a	Apr. 1994	July 1994	Sept. 1998	Mar. 2000
Newport	June 1992 ^a	May 1994	Mar. 1995	June 1998	May 1999
Aberdeen	July 1992 ^a	June 1994	Mar. 1995	June 1998	July 1999

^aAccording to Program Management officials, applications have been prepared, but not submitted to the state.

Permit Applications Not Clearly Prioritized

The Army has not effectively worked with the state regulatory agencies in Alabama and Arkansas to clearly establish the chemical demilitarization program permit application as a processing priority. In Alabama, regulators focused on processing a permit for another incinerator at Anniston Army Depot. As a result, no work was done on the chemical disposal facility permit for more than 1 year. The Army attempted to expedite permit application review only after it discovered that the state agency had done little work on the application. However, the state continues to estimate that permit approval will take 36 months from the time the applications were submitted in July 1990.

Similarly, the Arkansas regulatory agency did not begin reviewing the Army's permit application for the Pine Bluff facility for over a year because, according to state officials, they did not consider the demilitarization permit a priority and the Army did not establish a time frame for completing the permit.

An Army program management official acknowledged that the Army had not clearly prioritized the environmental permit application in Alabama. However, in the Army's view, previous delays in the approval of environmental permits have not adversely impacted the overall disposal program schedule. To date, these officials believe construction starts have been postponed as a result of funding cuts and not by delays in the review and approval of environmental permit applications.

Future Temporary Authorizations and Preliminary Construction Approvals Not Likely

In an attempt to maintain previously mandated completion schedules and to promote effective program management, the Army requested and obtained temporary authorization to proceed with chemical agent incineration at Johnston Island and started preliminary site preparation in Alabama before receiving a permit or soliciting public comment. Similar arrangements might not be possible in the future given the increased public awareness and opposition to incineration.

Public Law 99-145 directs the Secretary of Defense to destroy the U.S. stockpile of chemical agents and munitions in a manner that provides maximum protection for the environment, the general public, and the personnel involved in the destruction effort. The destruction of the agents and munitions must be carried out within the conditions described in the RCRA permit and regulations implementing RCRA. RCRA and its implementing regulations encourage public participation and requires public notification of the regulatory agency's intent to issue a new permit or approve substantive modifications to an existing permit. After public notification, a member of the public can request a public hearing during which both written and oral comments may be presented.

However, federal regulations also allow regulatory agencies to temporarily authorize environmental permit changes, without prior public involvement, under certain conditions. Temporary authorizations may be granted to prevent disruption of ongoing waste management programs and to protect human health and the environment. On this basis, EPA approved the Army's requests for temporary authorizations allowing chemical agent incineration on Johnston Island to proceed under modified permit conditions. The Army also initiated preliminary site preparation at the Anniston site before receiving a permit and before state regulatory officials solicited public comment and review. The Army told regulatory officials that the temporary authorization and preliminary site preparation works were warranted to avoid further delays in completing congressionally mandated operational verification tests and to avoid possible loss of funding for construction of stateside facilities.

Based on discussions with state regulators, the Army may not be able to continue to rely on similar actions to expedite program completion because of the increasingly high level of public interest in the chemical weapons incineration program. Based on guidance from EPA, Army program management officials told us that they most likely will not rely on future temporary authorization requests as a means of expediting program activities.

**Johnston Island Facility
Received Temporary
Authorization**

In August 1985, the EPA regional office in San Francisco authorized construction of the Johnston Island facility. During subsequent construction and pre-operational testing, the Army adopted numerous modifications to the original design and operating conditions. In April 1990, just before the Army wanted to start toxic agent incineration, Army officials asked the EPA regional administrator how the approval process could be expedited. Following these conversations, the Army requested a temporary authorization to begin operation under the modified conditions.

The Army's temporary authorization request, submitted to EPA on April 30, 1990, stated that there was insufficient time in the disposal program schedule to permit full consideration and evaluation of public comment. Moreover, the Army stated that funding for construction of stateside facilities would be jeopardized if further delays occurred.

In June 1990, after reviewing the technical merits of the Army's requested permit modifications, EPA allowed the Army to begin operations under temporary authorization because timely completion of the ongoing congressionally mandated chemical weapons disposal program was considered a national priority.

**Anniston Received Site
Preparation Approval**

In Alabama, state environmental regulators, in September 1990, allowed the Army to start preliminary site preparation of the Anniston facility even though an environmental permit will likely not be issued until October 1993. This work involves raising the facility site by 25 feet and Army officials estimated that it would cost \$1.9 million. The Army maintained that approval to proceed with preliminary site preparation was necessary to avoid slippage in program schedules. Under RCRA, an incinerator operator must have a permit before beginning physical construction of an incinerator. Federal regulations have defined physical construction to include excavation and movement of earth. We discussed these facts during our June 1992 testimony before the Subcommittee on Environment, Energy and Natural Resources, House Committee on Government Operations.³ Subsequently, we received a congressional request to determine whether or not the Army's preliminary site preparation at Anniston, Alabama, violated federal environmental laws or regulations. We are reviewing this matter and will report our findings in the near future.

³Chemical Weapons Destruction: Issues Related to Environmental Permitting and Testing Experience (GAO/T-NSIAD-92-43, June 16, 1992).

Conclusions

It may not be possible for the Army to complete its chemical weapons disposal program as planned. Public opposition to the program has resulted in state legislation that could prevent construction of incineration facilities in some states. In response to this opposition, the Army has started to study possible alternative technologies for destruction of the chemical weapon stockpile. Congress has postponed funding approval for future incinerators until the results of this study are known.

Although Congress extended the authorized disposal program completion date 5 additional years, to December 31, 2004, the Army needs to apply lessons learned from previous environmental permitting activities. For example, more time will be needed to process environmental permit applications than originally anticipated. Further, the Army must clearly prioritize the importance of timely review of chemical stockpile disposal environmental permit applications to state regulatory agencies. Finally, the Army should not continue to rely on temporary permit authorizations and preliminary site preparation approvals to expedite destruction program activities. This expedited process may not be possible in the future due to increased public awareness and opposition to destruction of chemical weapons by high-temperature incineration.

Recommendations

We recommend that the Secretary of the Army

- establish clearly defined work priorities for state permit reviewers to follow in those states having other hazardous waste permit applications in process for DOD programs and
- require that program officials submit requests for authorization to begin construction projects and requests for permit modifications early enough to allow time for orderly processing, including full public review and comment.

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