Foreword

The Department of Defense is pleased to provide Congress with this report on the progress and accomplishments of the Defense Environmental Restoration Program for fiscal year (FY) 1998. This report meets the requirements of Title 10 of the United States Code, Section 2706.

DoD's commitment to open communication and strong working relationships with stakeholders is advancing the Environmental Restoration Program on many fronts. We are building trust and doing the right thing by including communities, tribal governments, regulators and states as our partners in managing and implementing cleanup actions. During FY98, the Department continued to focus on partnering and cost-effective, timely cleanups. We are also reinventing the way we do business: we entered into a voluntary cleanup agreement with the Commonwealth of Pennsylvania. The first of its kind, under this agreement DoD will achieve permanent remedies years ahead of schedule. We are diligently pursuing similar agreements with other states.

We continue to involve communities in the Environmental Restoration Program and now have 340 installations participating in Restoration Advisory Boards with community representatives. Through the Defense State Memorandum of Agreement Program, the Department is partnering with 50 of the 56 states, territories, and the District of Columbia to accelerate cleanup more efficiently with fewer taxpayer dollars. Also, the Department continues to strengthen partnerships with tribal governments to address land contaminated by our past activities. To date, the Department is a party to six cooperative agreements with tribes. Through some of these agreements DoD will provide training to assist with unexploded ordnance cleanups, creating local community jobs in the process of completing cleanup.

DoD's Environmental Restoration Program continues to make progress. We are addressing more than 27,530 sites at over 10,000 installations and properties – including active, closing, and realigning bases and formerly used defense sites – across the country and in the U.S. territories. As of September 30, 1998, DoD has completed cleanup activities at 58 percent of its sites. In the base closure process, our goals are clear. DoD must complete safe, timely environmental cleanups that include all stakeholders in the process and return land to communities for economic development as soon as possible. In addition, 84 percent of BRAC acreage has all remedies in place and is transferable to the local community. We are "getting done."

We are ready and experienced to meet the challenges ahead. We are reducing risk to people and the environment, and making progress toward finishing the job of environmental cleanup.

Sherri W. Goodman
Deputy Under Secretary of Defense
(Environmental Security)

Introduction

"Leadership now, and into the next century, will depend on meeting challenges as a team. It will involve strengthening existing partnerships and building new ones — we want to continue to build trust and do the right thing!"

— Sherri W. Goodman, Deputy Under Secretary of Defense for Environmental Security

The mission of the Defense Environmental Restoration Program (DERP) is to clean up environmental contamination at current and former Department of Defense (DoD) installations. The program's goal is to clean up hazardous substances associated with past DoD activities. The program's primary objectives are to minimize the risk to human health and the environment, restore contaminated sites to productive use, and build trust with our stakeholders. In addition, at Base Realignment and Closure (BRAC) installations, the objective is to expedite environmental response actions to facilitate transfer or lease of BRAC property to local communities for reuse. This report highlights DoD's progress in fiscal year 1998 (FY98) and its plans and goals for each aspect of environmental restoration for the future.

The military components and agencies—the Army, Navy, Air Force, Defense Logistics Agency, and Defense Threat Reduction Agency—execute DoD's environmental cleanup program. The report describes the notable progress made in protecting the environment, U.S. military members and their families, and local communities from contaminants resulting from past DoD practices. The Defense Environmental Restoration Program is ongoing at 1,719 active and BRAC installations and 2,689 eligible Formerly Used Defense Site (FUDS) properties, which collectively contain 27,530 sites. In FY98, DoD performed environmental restoration at 10,019 of these sites and FUDS properties.

DoD continued to focus on partnering and cost-effective, timely cleanups as the top priorities for 1998. Partnerships with stakeholders, based on mutual trust and cooperation, are essential to the continued success of the cleanup program. Last year, a landmark agreement between DoD and the Commonwealth of Pennsylvania broke new ground both in partnering and in streamlining cleanups. The voluntary cleanup agreement created a comprehensive plan for addressing and cleaning up many defense sites in the Commonwealth earlier than originally planned. DoD has made it a national priority to engage in discussions with other states, using this agreement as a model for future agreements. DoD believes the fundamental advantage of this agreement is its structure, which provides stability in funding and the pace of program accomplishment. This predictability will allow all parties to the agreement to be more effective and efficient.

We believe that by sharing information and working directly with our stakeholders, we can *build trust by doing the right thing.* Ongoing DoD initiatives to cultivate working relationships with regulators and communities are maturing and producing real results. DoD has forged cooperative relationships with 50 states and territories

using Defense and State Memorandums of Agreement. Through these agreements, DoD reimburses states for the regulatory oversight they provide at defense installations and properties. On the community level, formation of, and active cooperation with, Restoration Advisory Boards (RABs) continue. These boards involve many stakeholders, who address cleanup issues of concern to the installations and surrounding communities.

DoD continues to pursue initiatives to refine and streamline cleanup activities. To manage their cleanup efforts, active and closing installations use management action plans and BRAC Cleanup Plans, respectively, to frame and describe their cleanup activities by site. These plans include input from regulators and from the communities around the DoD property. The RAB provides the vehicle for this dialogue. In addition, DoD uses peer review panels in many cases to ensure the selection of protective, cost-effective remedies. Through these panels, peer reviewers (including environmental remediation experts) consider the available technologies and life-cycle cost to recommend the best remedy for a site.

Remediation technology continues to be a major emphasis of the DoD cleanup program. This report addresses the use of innovative technologies and their role in the remediation process. The discussion includes their environmental and cost benefits, uses, and effectiveness.

New challenges for the cleanup program continue to emerge as environmental regulations and policies evolve. DoD realizes it must continually address these changes to preserve and sustain the public's trust in DoD's commitment to fulfilling its environmental obligations. To meet these challenges and cultivate public trust, DoD is improving its communication and coordination across the Department as the program matures. DoD and the military components have created Internet sites with links to other sites across DoD, sites at other federal and state regulatory agencies, and additional environmental sites that might be of interest. This web of resources encourages parties to access information on defense policies, programs, and initiatives for environmental restoration.

This report provides the details of the technical and financial status of the cleanup program (as of the end of FY98) and outlines plans and funding requirements for further progress. The report shows planned versus achieved progress, program goals, and the performance measures used to evaluate progress, and includes projections for future performance. In addition, this report presents information on any delays in property transfers caused by lead-based paint sampling, cost recovery from other responsible parties, and land use plans at DoD installations.

The Office of the Deputy Under Secretary of Defense (Environmental Security), in conjunction with the Military Departments and the Defense Logistics Agency, has prepared this report to satisfy congressionally mandated requirements.

Background

The Department of Defense's (DoD's) formal environmental cleanup efforts began in 1975 under the Army's Installation Restoration Program (IRP). Over time, environmental laws and regulations required more systematic and far-ranging environmental cleanup efforts by the public and private sectors across the nation. The Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund, in 1980. This law is the primary basis for the Defense Department's present cleanup program. In 1986, the Superfund Amendments and Reauthorization Act (SARA) formally established the Defense Environmental Restoration Program (DERP) and its funding mechanism, the Defense Environmental Restoration Account (DERA). In 1996, DoD decided to separate, or devolve, DERA into five Environmental Restoration (ER) accounts. Administration of these accounts occurs through the military components and agencies — Army, Navy, Air Force, Formerly Used Defense Sites (FUDS), and Defense-Wide. The last account includes the Defense Logistics Agency (DLA), the Defense Threat Reduction Agency (DTRA), and operating funds for the Deputy Under Secretary of Defense Environmental Security (DUSD(ES)) Cleanup Office. By devolving DERA, DoD intended to increase each Military Department's and agency's responsibility and accountability for environmental cleanup efforts. The Office of the Assistant Deputy Under Secretary of Defense for Environmental Cleanup has oversight responsibility for these accounts.

The Defense Environmental Restoration Program consists of three categories: Installation Restoration (IR), Other Hazardous Waste (OHW), and Building Demolition / Debris Removal (BD / DR). This report focuses on IR activities at active installations, FUDS, and installations undergoing base realignment and closure (BRAC). For the purposes of this report, the terms "DERP" and "Environmental Restoration Program" refer specifically to restoration activities (i.e., cleanup) at active installations, FUDS properties, and BRAC installations. Table 1 provides brief definitions of these and other key terms.

Environmental Restoration Program

The goals of the Environmental Restoration Program include identification, assessment, investigation, and cleanup of sites[1] contaminated with hazardous substances, pollutants, and wastes resulting from past activities at current and former DoD installations. Funding for active installation cleanup comes from four of the five defense environmental restoration accounts. The fifth account applies to cleaning up Formerly Used Defense Sites. FUDS are properties that DoD owned, leased, or otherwise operated before 1986 but no longer controls. The U.S. Army Corps of Engineers manages the FUDS program and evaluates information concerning land transfer, current ownership, and the origin of contamination at FUDS properties to determine whether a site is eligible for DoD funding. This evaluation occurs in the Preliminary Assessment (PA) phase. If a FUDS property is eligible for DoD funding and further response is necessary, the identified FUDS property enters the cleanup process.

[1] *In this report, the term "site" refers to a discrete area (or parcel) on an installation or former DoD property where cleanup actions are under way or where the investigation of possible contamination is occurring. In most instances there are many sites on a military installation or FUDS property.*

Installations identified for closure through the Base Realignment and Closure rounds in 1988, 1991, 1993, and 1995 have a separate funding source—the BRAC account—which is included in the overall Military Construction appropriations. Environmental restoration activities at installations closing under the BRAC laws must include planning and

Table 1
Cleanup Program and Funding Terms Used Throughout This Report

Term	Acronym	Description
Component		Military Service (also referred to as Department) or Agency Department of the Army (includes FUDS) Department of the Navy (includes the Marines) Department of the Air Force Defense Logistics Agency Defense Threat Reduction Agency
Defense Environmental Restoration Program	DERP	For purposes of this report, DERP refers to DoD's environmental restoration activities at active installations, BRAC installations, and FUDS properties.
Environmental Restoration	ER	Environmental restoration involves identification, investigation, and cleanup at active and BRAC installations and FUDS properties, including areas where contamination extends beyond installation boundaries.
Formerly Used Defense Sites	FUDS	FUDS are properties that DoD used in the past and for which DoD may have an environmental restoration responsibility. The U.S. Army Corps of Engineers manages the FUDS program.
Base Realignment and Closure	BRAC	Environmental restoration activities at BRAC installations are the same as at active installations. Funding for BRAC installations occurs through a separate appropriation in the BRAC account, different from the account for active installations and FUDS properties.
Installation Restoration	IR	Funded by five separate environmental restoration accounts, the military components implement IR activities at active installations and FUDS properties. At BRAC installations, IR activities are conducted by the Components and funded by the BRAC account.
Defense Environmental Restoration Account	DERA	This historical term describes cleanup funding for active installations and FUDS properties before devolvement occurred in FY97, separating funding into five separate accounts.

completion of environmental analysis for property disposal, which are required by the National Environmental Policy Act (NEPA). The BRAC account provides funds for this planning and for closure-related environmental compliance activities. Any property scheduled for realignment (that is, property that DoD will continue to use but for a new purpose) at an installation that is otherwise undergoing closure is accomplished under the appropriate active-base environmental restoration account.

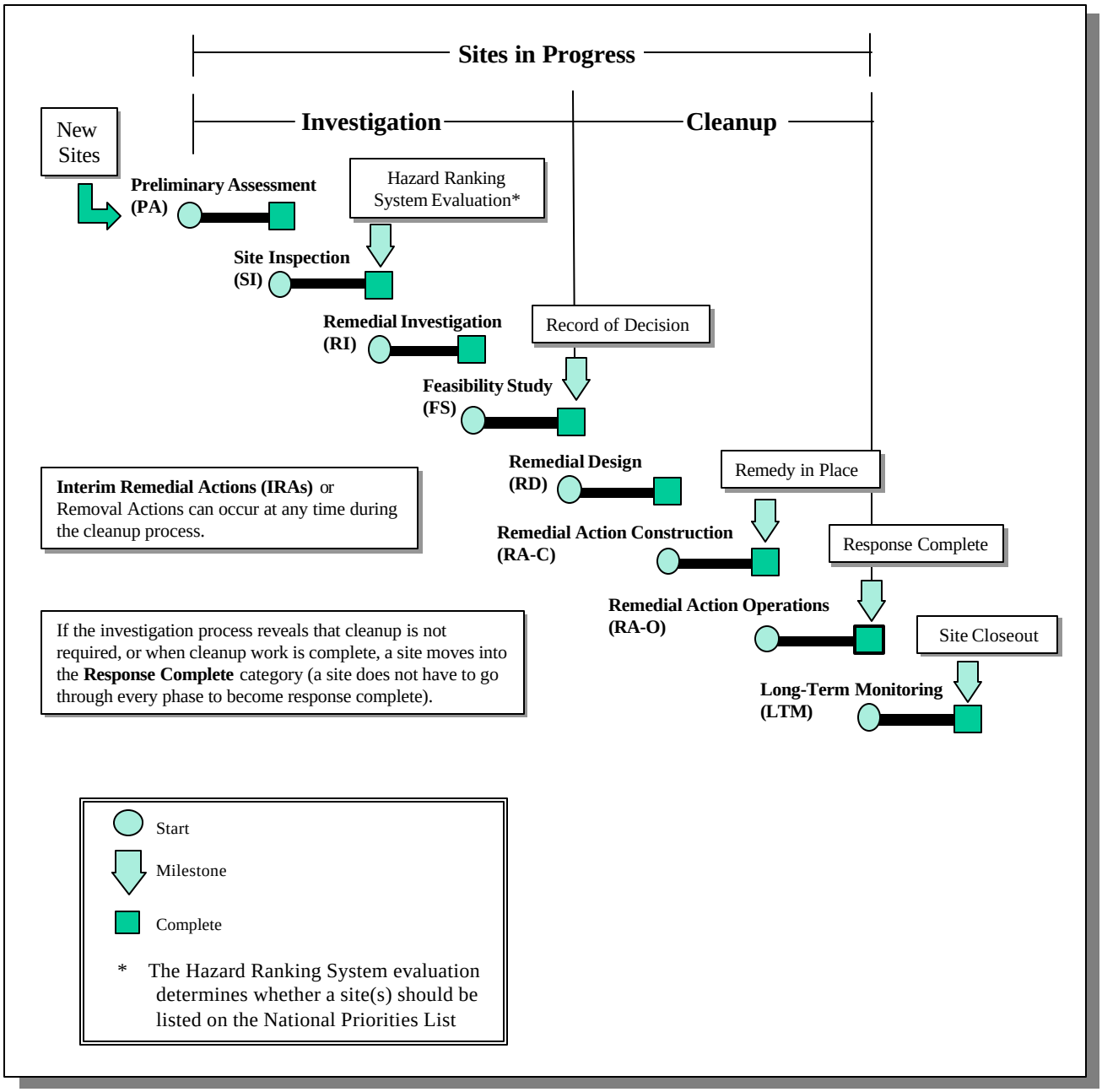
The Cleanup Process

Environmental laws and DoD policy prescribe the procedures and management of environmental restoration sites identified at active installations, FUDS properties, or BRAC installations. The process of investigating contamination at a site, determining how to clean it up, and then performing the cleanup can be complex. There are several steps in the cleanup process, illustrated in Figure 1, which may include the following elements.

- The preliminary assessment and site inspection (SI) determine the likelihood of contamination and its possible sources.
- The remedial investigation (RI), which includes sampling and analysis, determines whether contamination is present; a risk assessment determines the significance of the contamination. The results of this phase determine whether cleanup is required.
- The feasibility study (FS) includes evaluation and selection of remedial options, such as new technologies.
- The remedial action includes the design (RD), construction (RA-C), and (where necessary) operation (RA-O) of the selected remedy.
- Long-term monitoring (LTM) measures the continued effectiveness of the cleanup activities.
- Site closeout (SC) occurs when the appropriate regulatory agency has agreed that the cleanup process is complete.

As sites progress through the cleanup process, DoD categorizes the sites to facilitate program monitoring and evaluation. Upon identification, a new site enters the *site investigation category*. This starts with the preliminary assessment/site inspection phase in which the site is evaluated to determine the presence, extent, and source of contamination. If further investigation is necessary, the study of the site continues through the remedial investigation and feasibility study phase. If this phase determines that cleanup activities must occur to protect human health and the environment, the phase concludes with the establishment of cleanup objectives and the selection of cleanup technologies. Sites that require cleanup move into the *site cleanup category*. Cleanup begins with design of the remedy, followed by construction and, if necessary, operation of the remedy. When all intended cleanup activities at a site are complete, or if cleanup is not necessary, the site moves to the *response complete (RC) category*. After a site achieves RC, it may require long-term monitoring and five-year reviews by DoD and the regulators to confirm the accomplishment of cleanup objectives and to determine suitability for site closeout. In addition, the implementation of interim remedial actions, which are short-term actions to contain or

Figure 1
Cleanup Process Phases and Milestones



remove immediate contamination threats to human health and the environment, can occur at any point in the program. Interim actions also help to accelerate the program and may be the only response action necessary to clean up a site.

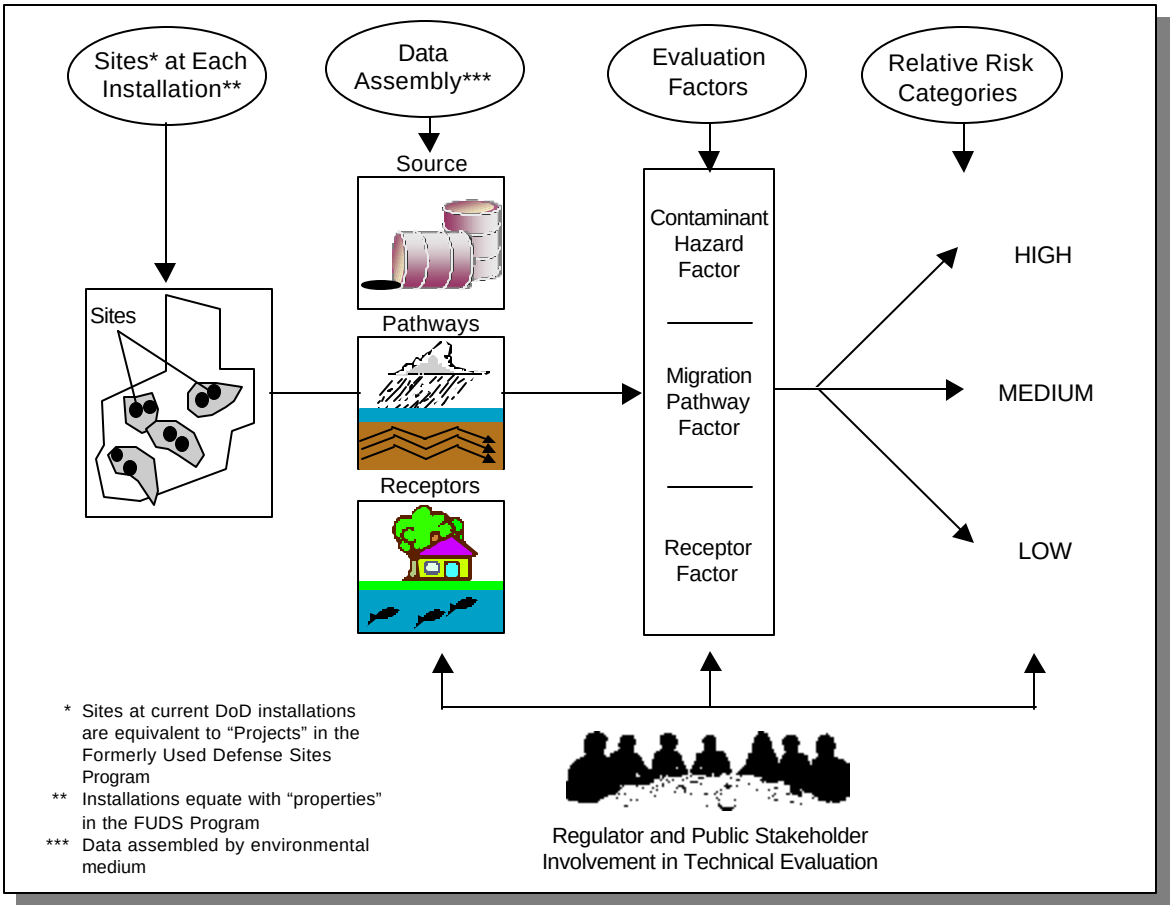
The term *in-progress* categorizes sites in the investigation category (PA / SI and RI / FS) or the cleanup category (remedial design, remedial action construction, and remedial action operation), and sites undergoing an interim remedial action. This report uses the term in-progress frequently. The number of sites in-progress changes as the cleanup program evolves through the identification of new sites and the movement of sites to RC.

Site Cleanup Prioritization

Since DoD manages thousands of environmental restoration sites across the nation, it needed a tool to aid in sequencing site requirements to address the most serious threats to human health and the environment first. As a result, DoD developed a management tool called relative risk site evaluation (RRSE). This tool allows stakeholders to evaluate the relative risk posed by a site compared with other sites. This methodology, developed in coordination with regulator and community stakeholder groups, ensures a corporate understanding and builds support for this approach. RRSE groups sites into high-, medium-, and low-relative-risk categories based on an evaluation of site information concerning three factors: extent of contamination, the possibility that the contamination will migrate from the source, and exposure to human and ecological "receptors." Evaluation of media (i.e., groundwater, surface water and sediment, and soil) against these three factors must be done to determine the relative risk category (Figure 2).

The RRSE category, in conjunction with other risk management considerations, such as risk assessments, statutory and regulatory status, program goals, public stakeholder concerns, and economic factors, helps determine a site's funding priority. This concept is known as "risk plus other factors." In addition, the use of RRSE as a programmatic tool is helpful for measuring work accomplished by tracking the reduction of the number of sites in each relative risk category.

Figure 2
Summary of the Relative Risk Site Evaluation Process



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DoD Relative Risk Site Evaluation Primer
http://www.dtic.mil/envirodod/relrisk/relrisk.html

The Budget Process

DoD's budget authority constitutes 15 percent of the total federal budget authority for FY99. The investment in environmental programs was $4.6 billion, which made up more than 1 percent of the DoD budget. Environmental restoration was almost one half of the DoD environmental budget. This demonstrated DoD's substantial commitment to managing and remediating environmental concerns resulting from past contamination. Appropriate allocation of that funding for cleanup activities depended on many factors, including identification of new sites, issuance of new policies and guidance, and promulgation of new regulations. Budgeting for the Environmental Restoration Program required stable funding and flexibility in selecting cleanup remedies. At the same time, planning must be rigorous and consistent over time to meet the requirements of the DoD budget process. Construction of the overall DoD budget begins at the site level and builds to the Component level within the guidelines provided by stable funding. Stable funding provides the ability to plan—and make commitments. This process consists of the following interrelated phases: planning, programming, budget development, and program execution. Figure 3 illustrates this process.

The Planning Phase

In this phase, DoD develops and provides program goals to the Components by using the *Defense Planning Guidance* (DPG). The DPG is the primary tool for guiding DoD's investment in weapons systems, readiness, and in this case, the environment. DPG goals for the Environmental Restoration Program include reducing risk to human health and the environment at sites; making property at BRAC bases environmentally suitable for transfer; and having final remedies in place or achieving response complete status at sites and installations. Based on DoD and supporting Component guidance, each installation develops site-level requirements for achieving these DoD goals. These requirements are in each installation's management action plan (MAP) or BRAC Cleanup Plan (BCP) (discussed on page 13). The installation reviews and updates its MAP or BCP at least once each year to reflect changes in priorities, additional information on cleanup sites, policies, legislation, performance measures, and availability of funding. The best opportunity for stakeholder involvement and input occurs at this stage—at the installation level, when identification of new needs or annual revalidation of continuing requirements occurs.

The Programming Phase

The Components use the requirements identified in their respective installation MAPs and BCPs to prepare their input to the *Program Objective Memorandums* (POMs). The

POMs are long-range plans, covering a 5- to 6-year time frame, which demonstrate how the Components will achieve the requirement set out in the DPG. Each summer, the Office of the Secretary of Defense (OSD) reviews the Components' POMs and issues any program decisions (referred to as Program Decision Memorandums) to the Components to assist them in their preparation of the *budget estimate submittal.*

Budget Development

In the final phase of the budget process, the Components develop and submit budget estimates to OSD for review and approval. A stringent budget review conducted over 3 to 4 months in the fall of each year resolves any major issues or concerns. A major concern to DoD during this phase is reconciling DoD requirements with budget targets established by the Office of Management and Budget (OMB). A major concern to the DUSD(ES) Cleanup Office is requesting sufficient funding to meet the DPG goals. DoD then submits its budget to OMB for further review and approval before forwarding the budget to the President for signature. The President submits the budget to Congress early in the following calendar year (CY). The time frame associated with the development of each year's budget encompasses several years. For instance, the identification and updating of the environmental restoration requirements for the fiscal year 2000 (FY00) budget submission occurred at the installations from 1996 through 1998. The installation personnel documented these requirements in their MAPs and BCPs. After this 2-year development process, the President submitted the FY00 budget to Congress in early CY99. The FY01 budget requirements will follow a similar process, and the President will submit his FY01 budget request to Congress in early CY00.

Program Execution

When the Congress approves the budget, the five environmental restoration transfer accounts managed by the Components receive funds.

- Environmental Restoration, Army
- Environmental Restoration, Navy
- Environmental Restoration, Air Force
- Environmental Restoration, FUDS
- Environmental Restoration, Defense-Wide (including DLA, DTRA, and the DUSD(ES)/CL operating budget)

The military components are responsible for allocating funds to subordinate units to execute the program. A part of DoD's program oversight responsibility is monitoring the obligation of funds for fulfilling such commitments as civilian pay, investigation contracts, and cleanup contracts, along with monitoring the outlay (financial payment) of funds to contractors. Program execution allows implementation of the cleanup program.

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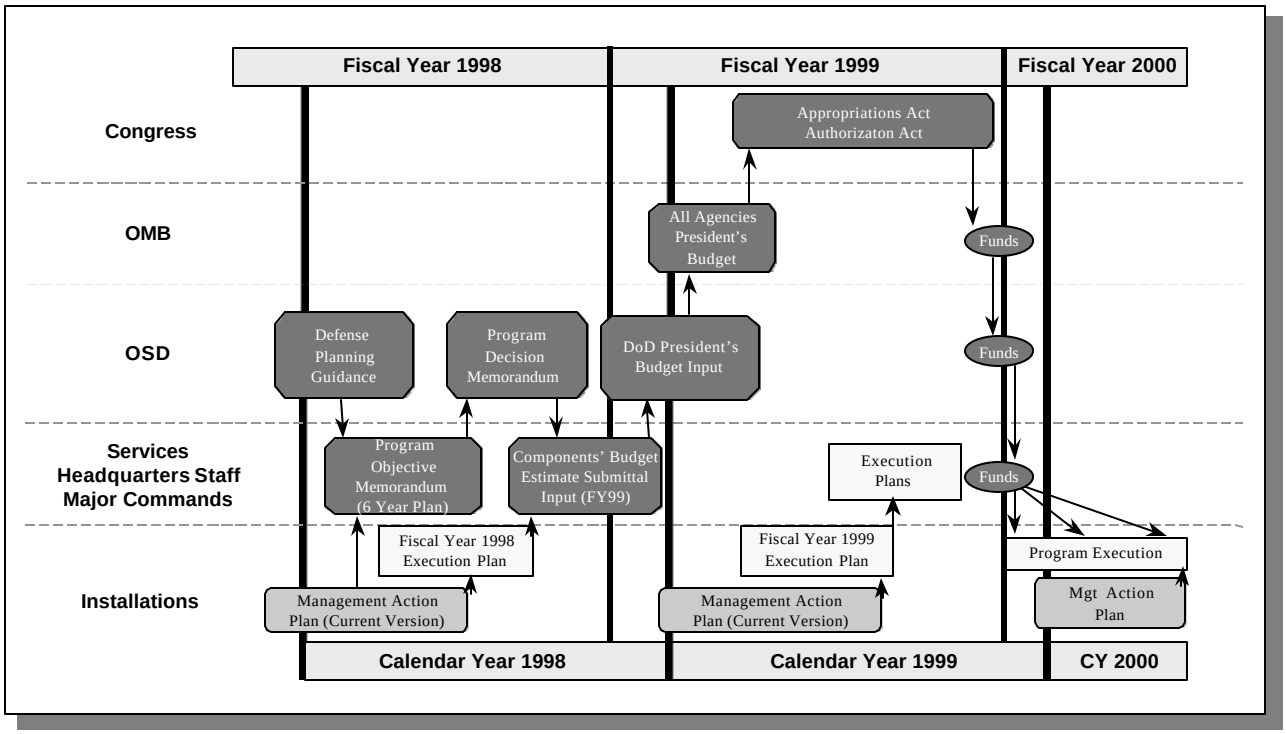
Guide to the DoD Environmental Security Budget
http://denix.cecer.army.mil/denix/Public/Library/Envirsb/envirsb.html

Figure 3
Cleanup Budget Process



Management Action Plans

DoD developed the Management Action Plan, or MAP, to function as the key document for managing an installation's environmental restoration program. The extensive planning required to develop a roadmap for cleanup and to obtain the necessary funding takes place at the installation level. A MAP is an installation-level planning document that consolidates information about an installation's past accomplishments, provides current site status, presents a vision for future site-level requirements, establishes schedules, and identifies funding requirements through the completion of site closure with the appropriate regulators. Installation-specific MAPs are essential building blocks for the budget process. Installation personnel update MAPs at least once each year to ensure that site-level requirements are current, since requirements can evolve significantly over time.

In March 1998, OSD issued a revised DERP Management Guidance. The Management Guidance further defined and elaborated on the purpose of installation and FUDS property MAPs, minimum content requirements, and requirements for regulatory agency and community stakeholder involvement in

A living document, the MAP provides a snapshot of installation restoration activities—

- History
- Response actions taken
- Site status
- Contaminants of concern
- Future site-level requirements
- Schedule
- Cost to complete estimate

the MAP development and review process. The MAP is the best vehicle for obtaining regulatory agency and stakeholder input into environmental restoration planning, work sequencing, and budgeting at an installation. Since the development and updating of MAPs occur at the installation level, regulatory agencies and community stakeholders have opportunities for input on relative risk site evaluations, work sequencing, schedules, and project funding.

This open and interactive approach to MAP development is an example of DoD's commitment to building community trust and implementing the recommendations of the Federal Facility Environmental Restoration Dialogue Committee (FFERDC).[2] MAPs incorporate the results of discussions between DoD, regulators, and community stakeholders. DoD uses this dialogue to increase regulatory and community participation in the overall environmental restoration process.

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DERP Management Guidance
http://denix.cecer.army.mil/denix/Public/ES-Programs/Cleanup/DERP/guide.html

At major BRAC installations where DoD is transferring property outside the Department, the BCP serves the same function as the MAP. Required since 1993, the BCP is the management tool used by the installation BRAC Cleanup Team to—

- Expedite and improve environmental response actions
- Focus cleanup efforts on sites posing higher risk or having higher reuse potential
- Integrate community redevelopment activities and schedules while protecting human health and the environment.

The BCP is a concise living document containing a snapshot of environmental programs and a macro-level strategy and schedule for accelerating environmental cleanup activities including—

- Brief history
- Property disposal and reuse plans
- Installation-wide environmental program status and strategy
- Master schedule
- Technical issues to be resolved

The BCP is a result of a "bottom-up review" of the installation's entire environmental program, and the installation updates it regularly to reflect status, strategy, and schedule changes. In addition, installations prepare a BCP abstract and forward it to DoD each November. The BCP abstract facilitates review of Fast-Track Cleanup successes and identification of issues, assists with trend analysis, and helps track progress.

WorldWideWeb

Fast-Track Cleanup at Closing Installations
http://www.dtic.mil/envirodod/brac/reissued.html

[2] *The FFERDC report, the result of a multiyear effort by stakeholders from DoD, EPA, other federal agencies, state and local governments, and environmental interest groups, presents these recommendations. When read as a whole, it represents a consensus statement on the part of the participants to guide the federal environmental cleanup program.*

The design of the program described in the MAP and BCP combines the cleanup process requirements with the budget process while embracing the requirements of extensive planning, opportunities for streamlined cleanups, and building cohesive partnerships with regulators and community stakeholders. Fidelity to the MAP and the BCP ensures DoD's ability to *build trust and do the right thing* to deliver a comprehensive Environmental Restoration Program that protects human health and the environment at each installation.

* * * * *

This section of the annual report briefly presented the major programmatic elements of the Environmental Restoration Program. Statutorily mandated elements and DoD's own management tools and processes contain drivers that mandate stakeholder involvement and program improvements.

The rest of this report details Environmental Restoration Program progress. It demonstrates DoD's commitment to being a good steward of the resources it manages and a responsible corporate citizen.

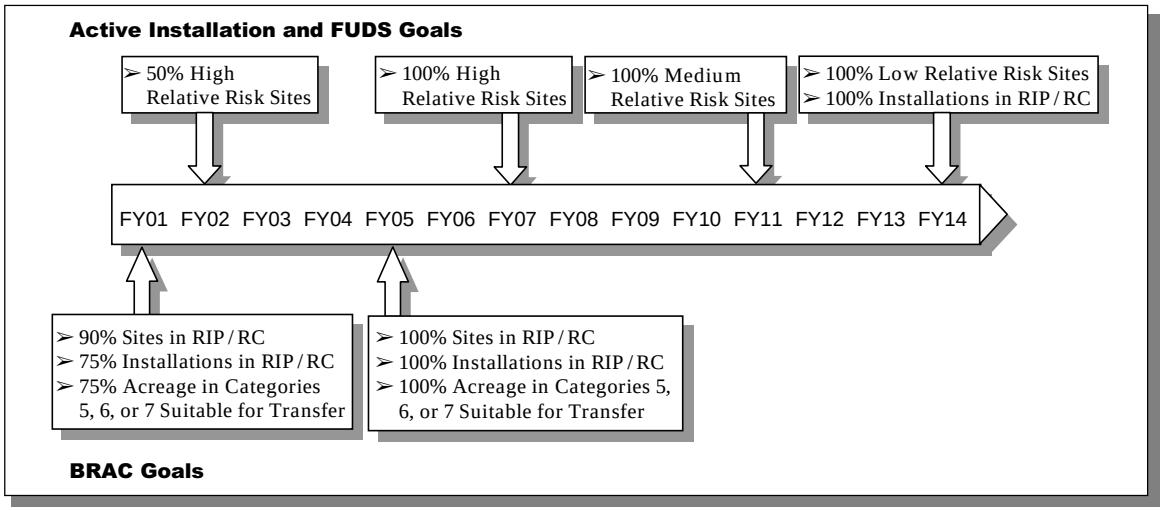
Program Status and Progress

Performance goals for the Environmental Restoration Program are given in DoD's overall program planning document, the Defense Planning Guidance. DoD uses measures of merit to ensure that the Components are effectively and efficiently budgeting for and executing their programs to achieve the DPG goals. DoD also uses these goals and metrics to ensure that the Department is doing the right thing and building trust with communities.

The DPG goals ensure that cleanup of all sites will be accomplished and that the sites with the greatest potential for causing harm to human health and the environment are addressed first (Figure 4). The specific DPG goals for active installations and FUDS properties are to clean up sites to a lower relative risk category (e.g., high relative risk to medium relative risk) and to have final remedies in place. The DPG goals for the active installations and FUDS properties are to reduce relative risk or achieve final remedy in place (RIP). The five goals are as follows:

- Active/FUDS 1—50 percent of high-relative-risk sites by the end of FY02
- Active/FUDS 2—100 percent of high-relative-risk sites by the end of FY07
- Active/FUDS 3—100 percent of medium-relative-risk sites by the end of FY11
- Active/FUDS 4—100 percent of low-relative-risk sites by the end of FY14
- Active/FUDS 5—100 percent of installations and sites with all remedies in place or response complete by the end of FY14.

Figure 4
Timeline of Defense Planning Guidance Goals



The DPG goals for BRAC installations focus on making property environmentally suitable for transfer, stressing fast and safe environmental restoration so that

communities can reuse the land and reap the economic and social benefits as soon as practicable. The DPG goals for the BRAC program are—

- BRAC 1—75 percent of the acres in Environmental Condition of Property Categories 5, 6, and 7 suitable for transfer by the end of FY01
- BRAC 2—90 percent of sites with remedy in place or response complete by the end of FY01
- BRAC 3—75 percent of installations with remedy in place or response complete by the end of FY01
- BRAC 4—100 percent of acres in Environmental Condition of Property Categories 5, 6, and 7 suitable for transfer by the end of FY05
- BRAC 5—100 percent of installations with remedy in place or response complete by the end of FY05.

Table 2
BRAC Property Categories

Category 1:	Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
Category 2:	Areas where only release or disposal of petroleum products has occurred
Category 3:	Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
Category 4:	Areas where release, disposal, and/or migration of hazardous substances has occurred and DoD has taken all necessary removal or remedial actions to protect human health and the environment
Category 5:	Areas where release, disposal, and/or migration of hazardous substances has occurred and removal or remedial actions are under way, but where all required remedial actions have not yet been taken
Category 6:	Areas where release, disposal, and/or migration of hazardous substances has occurred but where DoD has not implemented the required actions
Category 7:	Areas where DoD has not completed evaluations or that require additional evaluation.

The first and fourth goals refer to seven categories that chart the environmental condition of BRAC property, as shown in Table 2.

OSD provides guidance on meeting these goals through the DERP Management Guidance.

WorldWideWeb
DERP Management Guidance
http://denix.cecer.army.mil/denix/Public/ES-Programs/Cleanup/DERP/guide.html

DoD Components plan, budget, and execute the program with the goals in mind. OSD oversees the Components' progress toward achieving the DPG goals through data collection and evaluation of performance metrics, especially measures of merit, and comparison of projected progress with actual progress. DoD reports the results of these assessments throughout this section and the Installation Narratives in Appendix A. This section describes how OSD and the Components measure Environmental Restoration Program effectiveness and how cleanup program activities were coordinated with FY98 funding.

Measuring Progress

Management of site inventory, performance measures, and reporting are essential to an accurate evaluation of the DERP. OSD has issued guidance on standardized requirements for information management systems for collecting data and creating information. DoD continues to emphasize the importance of maintaining a consistent, reliable record of past activities and performance, as well as having an accurate understanding of the current situation and making credible future projections. Tables 3 and 4 present a summary of DoD's installation, property, and site inventories in the Environmental Restoration Program.

Table 3
FY98 Installation Inventory Summary

Active Installations					
Army	**Navy**	**Air Force**	**DLA**	**DTRA**	**Active Installation Subtotal**
1,076	197	258	15	2	1,548
BRAC Installations					
Army	**Navy**	**Air Force**	**DLA**		**BRAC Installation Subtotal**
117	53	31	4		205
Active and BRAC Installation Subtotal					1,719*
FUDS Properties					9,158
Grand Total					10,877

*Because some installations have both active and BRAC activities, the total number of active and BRAC installations is less than the sum of the active and BRAC installation subtotals shown in this table.

Table 4
FY98 Site Inventory Summary

Active Sites					
Army	**Navy**	**Air Force**	**DLA**	**DTRA**	**Active Site Subtotal**
10,204	3,468	4,494	364	36	18,566
BRAC Sites					
Army	**Navy**	**Air Force**	**DLA**		**BRAC Site Subtotal**
1,944	1,004	1,544	288		4,780
Active and BRAC Site Subtotal					23,346
FUDS Sites					4,184
Grand Total					27,530

Measures of Merit

Measures of Merit (MOMs) are the primary tool for measuring and reporting progress toward DPG goals. As performance metrics, they provide a consistent benchmark for reporting on and evaluating the program. MOMs fall into the following categories:

- Active installation, FUDS, and BRAC relative risk reduction shows the number of sites in each relative risk category for each fiscal year and indicates progress toward the DPG relative risk reduction goals.
- Active installation, FUDS, and BRAC phase progress shows the number of sites in the investigation, cleanup, and response complete/no-further-action-required phases and indicates progress toward the program goal of cleanup and site closeout.
- Active installation, FUDS, and BRAC Remedy in Place/Response Complete shows the number of installations that have all sites in the remedy in place (RIP) or response complete category and indicates progress toward the DPG goal of attaining final RIP or RC status at all sites and installations.
- Environmental Condition of BRAC Property shows the number of acres considered environmentally suitable or unsuitable for transfer and indicates progress toward the DPG goal of having all acres suitable for transfer.

In FY98, DoD tracked its environmental restoration progress using the MOMs described above. The discussion below presents the status of each MOM as of September 30, 1998.

Relative Risk Reduction

Relative risk reduction is DoD's method of ensuring that the primary focus of the program is on protection of human health and the environment. The reduction in the number of sites in each relative risk site evaluation category (i.e., high, medium, and low relative risk, and not evaluated) is used to measure the overall risk reduction and progress toward the DPG goals. Tables 5 and 6 show the number of sites in each relative risk category for each Component. In general, the number of sites that have reached the response complete milestone has increased from FY97, an indicator that more sites are reaching the final stages of the cleanup process. Another indicator of progress is the 27 percent reduction in the number of sites in the Not Evaluated category from FY97 to FY98. The evaluation of these sites caused the number of sites in some of the other relative risk categories to increase. Although the DPG goals specify reduction in the number of sites in the high-, medium-, and low-relative-risk categories, completing evaluations of all potential sites is essential to producing an accurate estimate of the effort required to ensure the protection of human health and the environment.

Figure 5 shows the percentage of the total sites planned for cleanup over the next 6 years that are in each relative risk category. Figure 6 shows the funding planned for these sites. Forty-five percent of sites planned for cleanup activities over the next 6 years are in the high-relative-risk category; these sites are projected to receive 62 percent of available funding, clearly demonstrating DoD's focus on high-relative-risk sites.

Table 5
End of FY98 Active Installation and FUDS Relative Risk Site Evaluation Status

		DoD Component						
		Army	Navy	Air Force	DLA	DTRA	FUDS	ER Total
Sites with Response Complete		7,961	1,570	2,268	279	2	1,885	13,965
Relative Risk of Sites in Progress	High	1,013	748	735	20	0	216	2,732
	Medium	536	440	440	7	0	83	1,506
	Low	602	389	618	13	0	41	1,663
	Not Evaluated	26	153	72	30	25	773	1,079
	Not Required*	66	168	361	15	9	1,186	1,805
Total Number of Sites		**10,204**	**3,468**	**4,494**	**364**	**36**	**4,184**	**22,750**

* Sites that have Remedy in Place, Response Complete, or no-further-action-required designations do not require relative risk evaluation, because DoD has committed to funding Remedial Action Operations and LTM requirements at these sites. In addition, Relative Risk Site Evaluations are not required at sites that exclusively address UXO, BD/DR, or PRP requirements.

Table 6
End of FY98 BRAC Relative Risk Site Evaluation Status

		DoD Component				
		Army	Navy	Air Force	DLA	BRAC Total
Sites with Response Complete		1,032	402	458	146	2,038
Relative Risk of Sites in Progress	High	217	240	223	24	704
	Medium	153	152	146	31	482
	Low	240	127	228	26	621
	Not Evaluated	290	47	394	58	789
	Not Required*	12	36	95	3	146
Total Number of Sites		**1,944**	**1,004**	**1,544**	**288**	**4,780**

* Sites that have Remedy in Place, Response Complete, or no-further-action-required designations do not require relative risk evaluation, because DoD has committed to funding Remedial Action Operations and LTM requirements at these sites.

Sites Planned for Cleanup Funding by Relative Risk Ranking FY99 through FY05

Figure 5
Percentage of Sites Planned

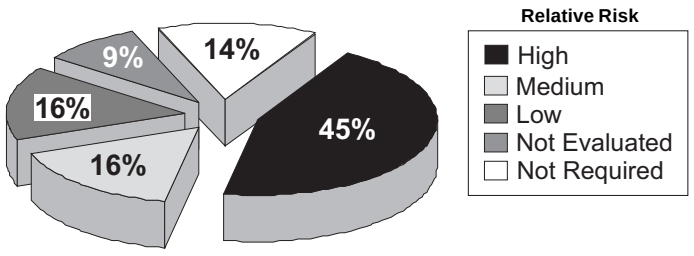
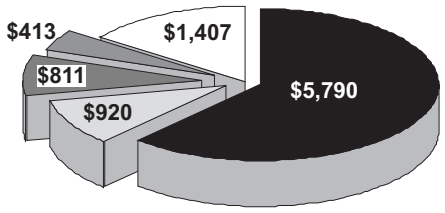


Figure 6
Planned Funding ($ Million)

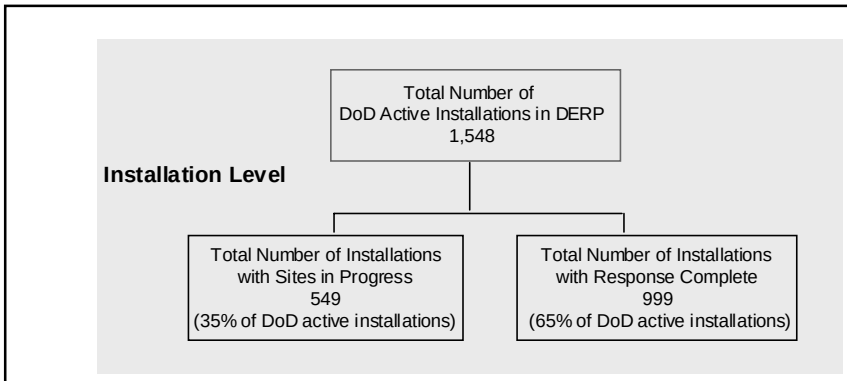


Phase Progress

Accurate measurement of progress, identification of issues, and analysis of trends are critical to successful, cost-effective DERP implementation and to accomplishment of reliable planning, programming, budgeting, and oversight.

OSD and the Components carefully track the number of sites in each phase (i.e., investigation, cleanup, and response complete) of the cleanup process. Interim actions can occur at any time in the cleanup process. Figures 7 and 8 display the status of all DoD's active and BRAC installations, respectively, and Figure 9 shows the status of all

Figure 7
FY98 Status of Active Installations



Phase Activities at DoD Active Installations

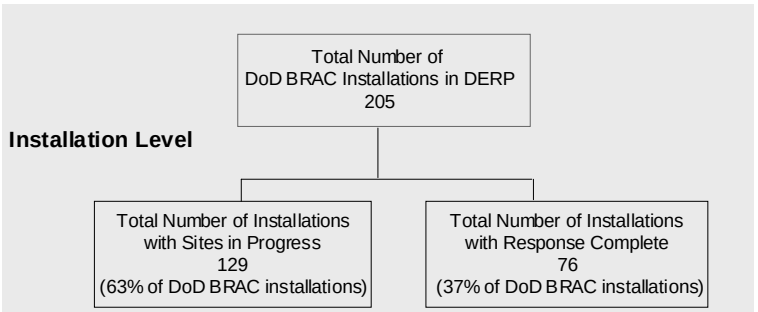
Phase	Completed	Under Way	Future
	Sites		
Phase Level			
Investigation*	13,955	4,128	483
Interim Action**	1,807 (2,448)***	656 (843)***	
Design	1,207	353	2,657
RA-C	1,837	583	3,215
RA-O	105	404	1,624
LTM	203	788	2,104

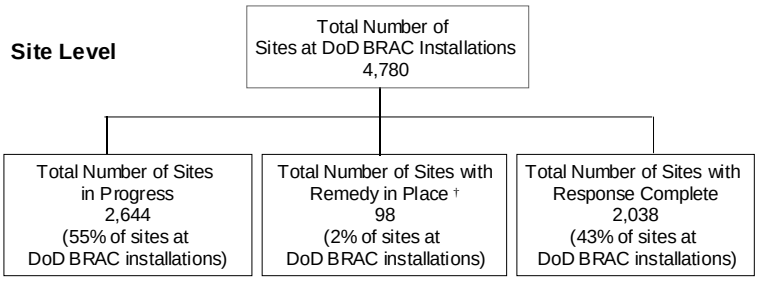
† RIP is a subset of Sites in Progress.
* The sum of the number of sites in Investigation Completed, Under Way, and Future equals the total number of sites in the program.
** Interim Actions can occur throughout the process.
*** Number of Interim Actions.

Refer to the Glossary in Appendix G for definitions of terms.

FUDS properties, as of September 30, 1998. Sixty-five percent of active and 37 percent of BRAC installations, and 65 percent of active installation sites and 43 percent of BRAC sites, have reached the response complete milestone. Of the 9,158 potential FUDS properties, 64 percent require no action. Of the 36 percent that require response action or further evaluation, 45 percent have reached the response complete milestone, an increase of 6 percent from the end of FY97. Overall, more than half of the installations and sites in the Environmental Restoration Program have reached the final stage in the cleanup process. DoD is meeting its short-term goals and plans to meet DPG goals but must surmount some significant challenges in the process.

Figure 8
FY98 Status of BRAC Installations





Phase Activities at DoD BRAC Installations

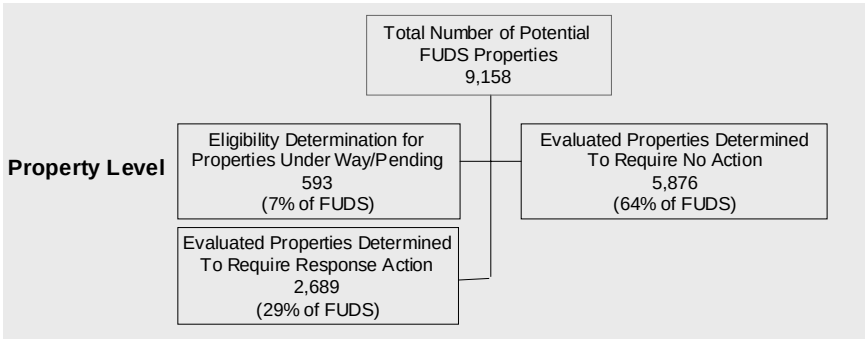
Phase Level

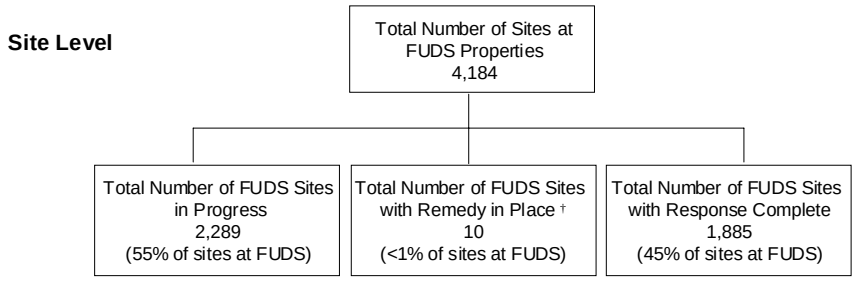
Phase	Completed Sites	Under Way Sites	Future Sites
Investigation*	3,059	1,714	7
Interim Action**	855 (1,073)***	436 (535)***	
Design	493	205	1,072
RA-C	557	272	1,452
RA-O	21	98	761
LTM	21	130	783

† RIP is a subset of Sites in Progress.
* The sum of the number of sites in Investigation Completed, Under Way, and Future equals the total number of sites in the program.
** Interim Actions can occur throughout the process.
*** Number of Interim Actions.

Refer to the Glossary in Appendix G for definitions of terms.

Figure 9
FY98 Status of Formerly Used Defense Site Properties





Phase Activities at Formerly Used Defense Sites

Phase Level

Phase	Completed Sites	Under Way Sites	Future Sites
Investigation*	2,685	622	877
Interim Action**	125 (125)***	30 (30)***	
Design	983	186	1,258
RA-C	880	343	1,429
RA-O	5	14	199
LTM	10	21	233

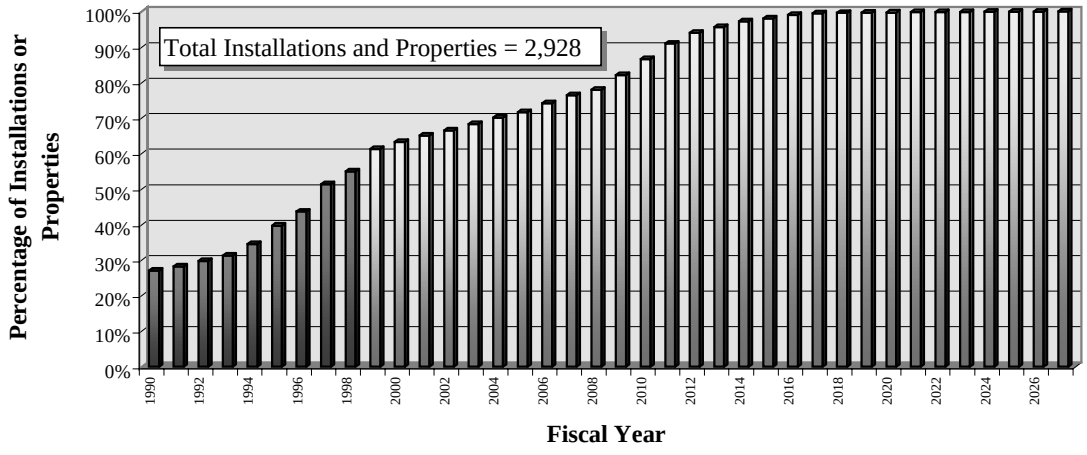
† RIP is a subset of Sites in Progress; does not include 146 PRP, OEW, and BD/DR projects where cleanup activity is under way.
* The sum of the number of sites in Investigation Completed, Under Way, and Future equals the total number of sites in the program.
** Interim Actions can occur throughout the process.
*** Number of Interim Actions.

Note: "Site" at a FUDS property means a cleanup project.
Refer to the Glossary in Appendix G for definitions of terms.

Installations with All Remedies in Place or Response Complete

DoD's remedy in place and response complete measures represent significant achievements in the DoD Environmental Restoration Program. When the last contaminated site at an installation attains either RIP or RC, the entire installation or property is classified as RIP or RC. The end of the remedial action construction phase and the start of the remedial action operation phase defines the RIP milestone. Figures 10 and 11 show the progress that DoD installations and FUDS properties have made through FY98, as well as projections of when DoD installations and FUDS properties will reach the RIP or RC stage of cleanup. Figure 10 shows accomplishments and projections for active installations and FUDS properties; Figure 11 shows BRAC installation status. At the end of FY98, 55 percent of active installations and FUDS properties and 40 percent of BRAC installations had all remedies in place or had reached response complete. This means that DoD has completed cleanup activities, with the possible exception of remedial action-operations and long-term monitoring, at more than half of its installations.

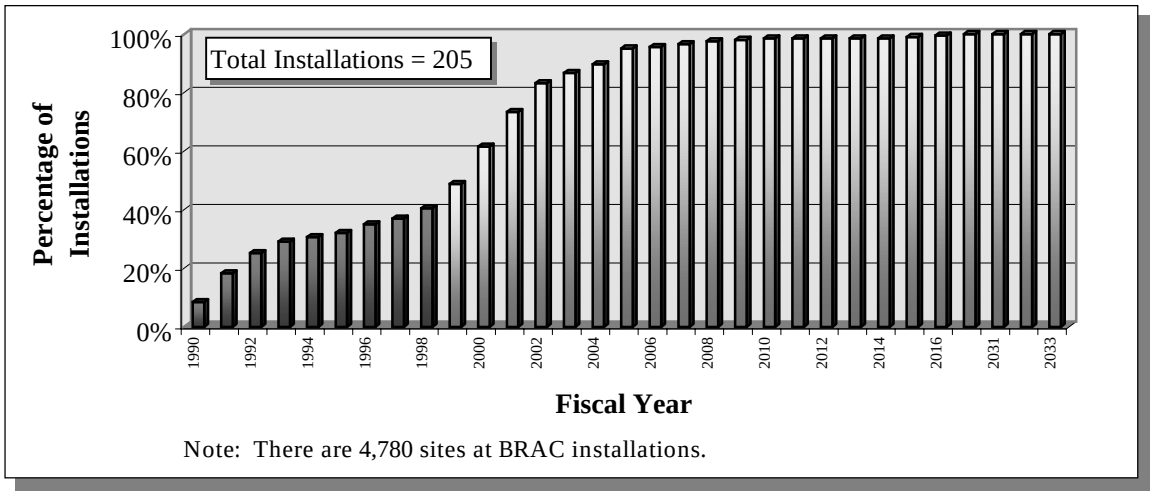
Figure 10
DoD Active Installations and FUDS Properties*
Achieving Final Remedy in Place or Response Complete
(cumulative FY90 through completion)



Note: There are 22,750 sites at active installations and FUDS properties.

* Does not include FUDS properties that only have BD/DR, unexploded ordnance (UXO), or potentially responsible party (PRP) requirements.

Figure 11
DoD BRAC Installations Achieving Final Remedy in Place or Response Complete (cumulative FY90 through completion)

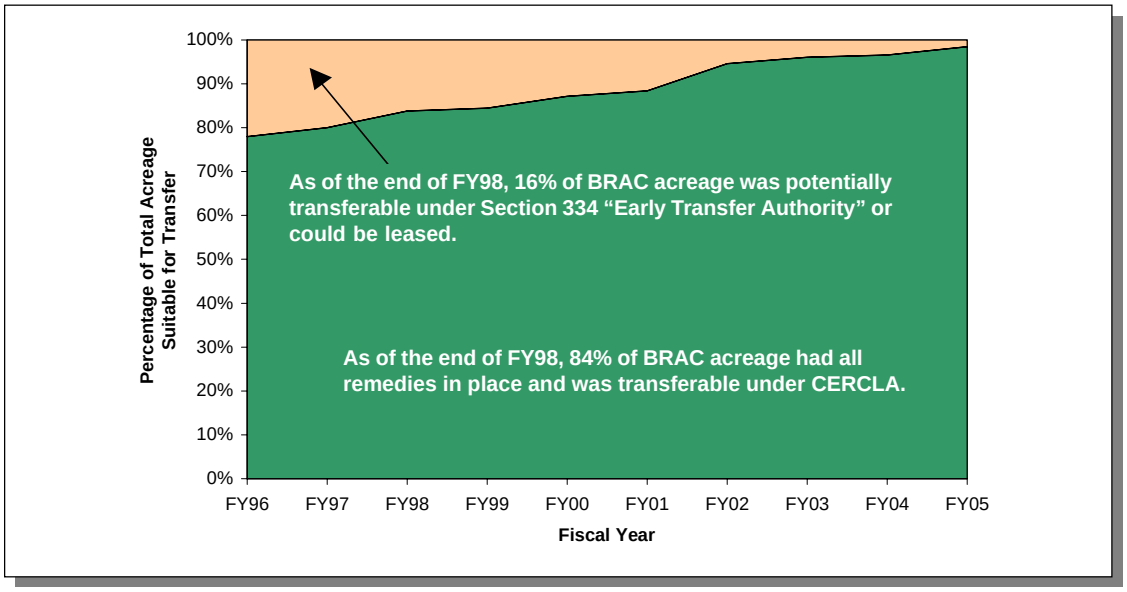


Note: There are 4,780 sites at BRAC installations.

Environmental Condition of BRAC Property

The main drivers of the BRAC environmental restoration process are to quickly and safely clean up sites and to facilitate communities' economic reuse and development by making property suitable for reuse. The number of acres suitable for transfer is expected to increase until FY05 when the DPG requires that all property in the current four BRAC rounds (1988, 1992, 1993, and 1995) be suitable for transfer. Current projections, however, indicate that 98 percent of BRAC property will be suitable for transfer by the end of FY05. At the end of FY98, 84 percent of the total BRAC acreage was environmentally suitable for transfer. DoD will not quite achieve the final acreage goal but is already exceeding the interim goal. Management attention over the next year will focus on expediting the schedule. Figure 12 shows the percentages of BRAC acreage suitable for transfer for FY98 through FY05.

Figure 12
Projected Status of BRAC Property



A change to CERCLA §120(h) known as the early transfer authority allows stakeholders to gain greater control over the future of BRAC property and their communities. In 1996 Congress passed an amendment to CERCLA §120(h) that allows full ownership of property before cleanup has been completed; therefore, it is not necessary for all cleanup activities to be completed for BRAC property to be transferred. Early transfer authority is a valuable tool for helping communities take control of their future. Early transfer is a relatively new process (it was first implemented by DoD in 1997) and has made a good start with five early transfers implemented to date. DoD expects many more early transfers in the future as it shares lessons learned and refines the process.

Other Metrics of Program Progress

In addition to the measures of merit, DoD uses program management indicators (PMIs) to gauge progress in cleanup activities. The following PMIs focus on site-level progress through selected milestones. The section below presents the status of site inventory as of September 30, 1998, including the number of sites that have implemented an interim action, the number of sites in progress, and the number of sites that have all remedies in place or have reached response complete. These PMIs apply to active installations, FUDS properties, and BRAC installations.

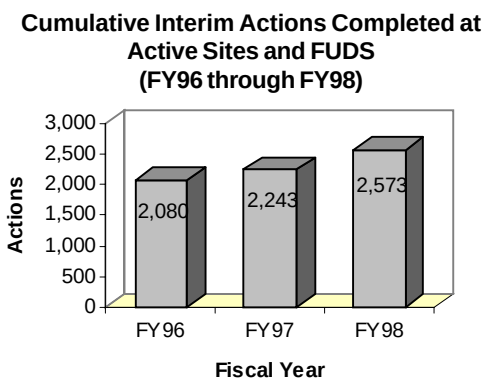
Interim Actions Completed

Interim actions are early measures that reduce the risk posed by the release of hazardous substances before the completion of final cleanup remedies. For example, placing fences around contaminated areas and removing, treating, or disposing of contaminated soil can be interim actions. These interim actions reduce risk by eliminating a contamination pathway. In many cases, the interim action becomes the final remedy after further study shows that there is no more risk to human health or the environment. Figure 13 shows the number of interim actions completed through FY98 for active and BRAC installation sites and for FUDS. As of September 30, 1998, the DoD cleanup program had completed 3,646 interim actions at 2,787 sites. The list below shows the number of interim actions completed at active installation sites, FUDS, and BRAC sites.

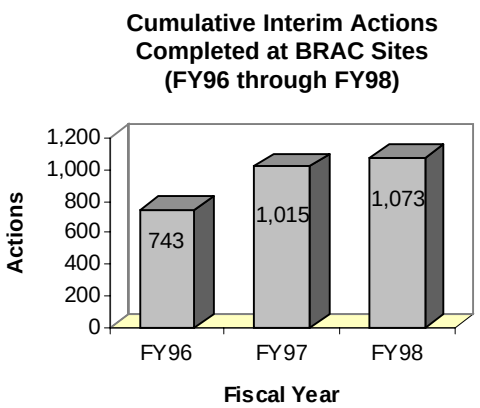
- 2,448 interim actions at 1,807 active installation sites
- 125 interim actions at 125 FUDS
- 1,073 interim actions at 855 BRAC sites.

In some cases, a site can achieve the RIP or RC milestone as a direct result of an interim action. When this occurs, the site does not need to go through the other steps in the cleanup process. Through September 30, 1998, 214 sites had achieved RIP or RC directly after implementing an interim action.

Figure 13



330 Interim Actions were completed at active installations and FUDS properties in FY98

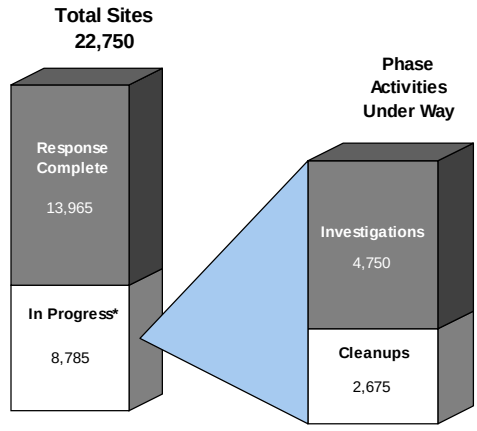


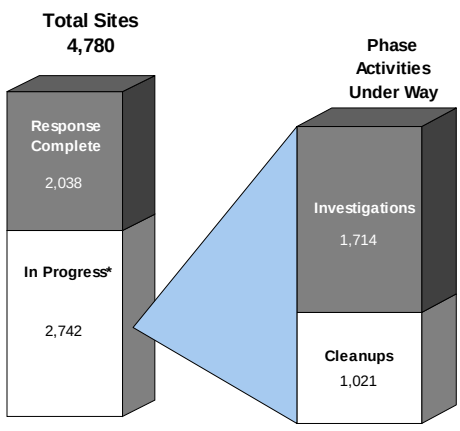
58 Interim Actions were completed at BRAC installations in FY98

Sites in Progress

DoD defines sites in progress as the number of sites that have not yet reached RC. This PMI designates where the site is in the Environmental Restoration process shown in Figure 1. This measure supplements the phase progress MOM, described earlier, which measures the number of sites that have completed each phase. There are now 9,228 sites in progress at 1,719 active and BRAC DoD installations and 2,299 sites in progress at 9,158 FUDS properties (Figure 14). There are fewer sites in progress in FY98 than in FY97. However, in the active and FUDS and BRAC sites in progress category, there are more sites in the cleanup phase than there were in FY97, and fewer sites in the investigation phase.

Figure 14





* In-progress includes sites that will be under way in the future. Therefore, totals of sites with phase activities under way are generally less than the total number of sites in progress.

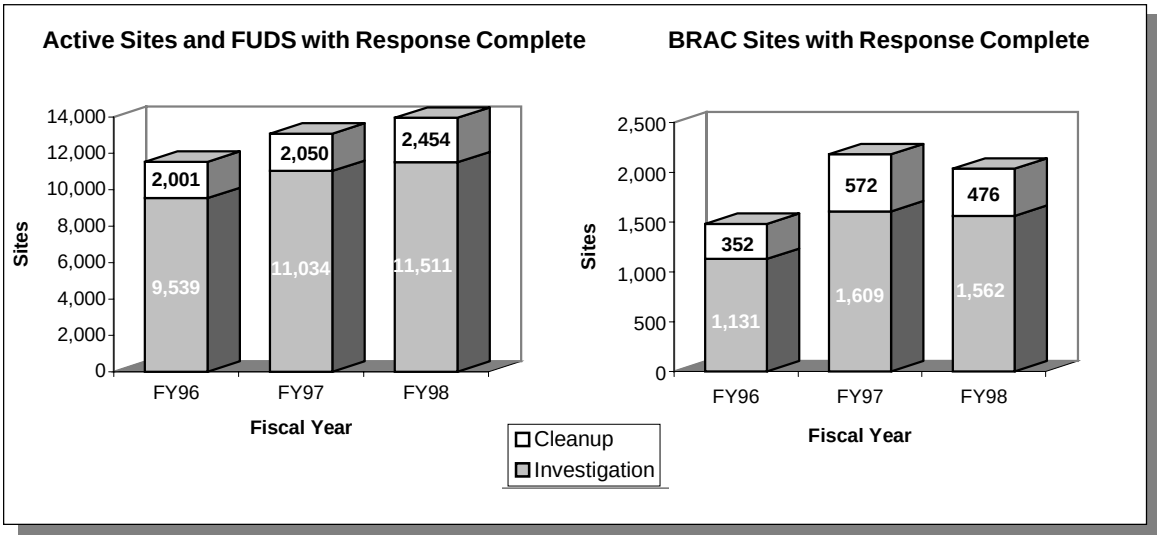
Sites with Remedies in Place or Response Complete

This PMI is similar to the third measure of merit. The MOM counts the number of installations at RIP or RC, whereas this PMI examines the number of sites that have attained these milestones. Completion of remedy construction and the start of operation of the remedy define the RIP milestone. The RIP designation is similar to placement on EPA's construction completion list for National Priorities List (NPL) sites. A site qualifies for the construction completion list when all necessary physical construction of the remedy has been completed, EPA has determined that no construction is required for implementing the remedy, or the site qualifies for deletion from the NPL.

DoD counts a site as RC after the Component determines that the site meets the remedial objectives required in the remedy decision document. Many sites are determined to be RC as a result of investigation's showing no need for further response actions. If a site requires further monitoring after the response is complete, the site may proceed to the long-term monitoring phase before eventual site closeout. A site reaches the RC milestone at completion of the remedial action operations phase. If no remedial action operations are required, a site can achieve the RC milestone at the end of remedial action construction.

Of the 27,530 total sites at DoD active installations, FUDS properties, and BRAC installations, 58 percent are response complete (Figures 7, 8, and 15). Since the end of FY97, the number of sites with remedies in place has increased by 111, bringing the total to 691 sites (Figures 7 and 8). DoD classified approximately two-thirds of the sites in the response complete category as RC directly from an investigation phase because no cleanup activities were required (Figure 15). This indicates that most sites required no cleanup activities to meet the regulatory requirements.

Figure 15

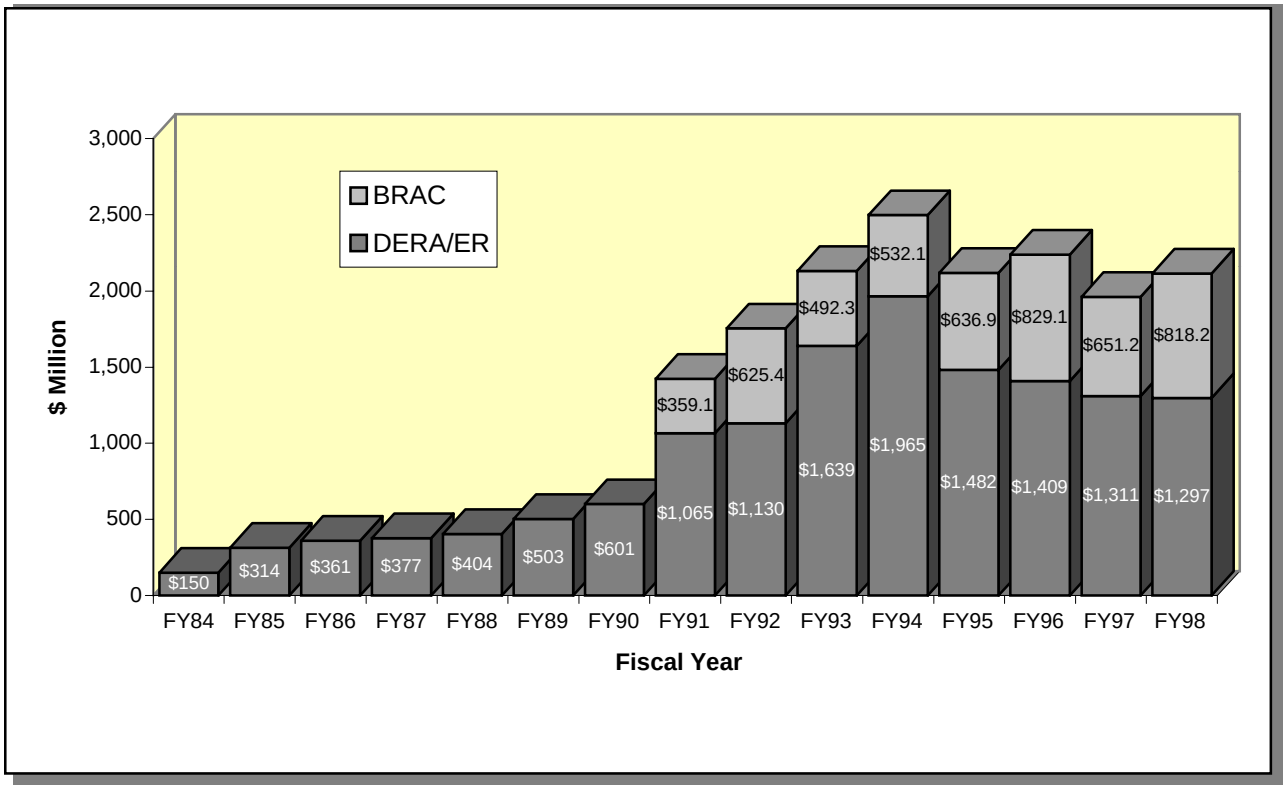


Program Funding

As DoD has become more knowledgeable about the extent and type of challenges the environmental restoration program faces, its planning and funding estimates have become more reliable. This capability, along with stable funding, has allowed DoD to plan more efficiently and to concentrate on fulfilling its commitment to protecting human health and the environment by completing the Environmental Restoration Program. This section presents the Environmental Restoration Program's past and current funding status and progress.

Through the end of FY98, DoD had invested almost $19 billion in the program: $14 billion and $5 billion for DERA / ER (active installations and FUDS) and BRAC (closure installations) accounts, respectively (Figure 16). In FY98, Congress appropriated almost $1.3 billion for Environmental Restoration accounts and $818.2 million for BRAC accounts. The funding for the BRAC environmental program is part of the overall BRAC account and encompasses more than environmental restoration efforts. BRAC environmental funding also addresses closure-related compliance and environmental planning activities. Funding for active installations and FUDS activities decreased slightly in FY98; BRAC funding increased almost 20 percent from FY97 levels.

Figure 16
Funding History



ER (Active Installations and FUDS) Account Status

Funding is expected to be relatively stable over the next 3 years, as indicated by the DERA/ER funding trend shown in Figure 17. Figures 18 and 19 show actual and planned program obligations for program support, investigation, and cleanup. In FY98, funding for site investigations increased, reflecting regulatory requirements for more investigation, Component desires to accomplish work at low and medium risk

Figure 17
DERA/ER Funding Trend

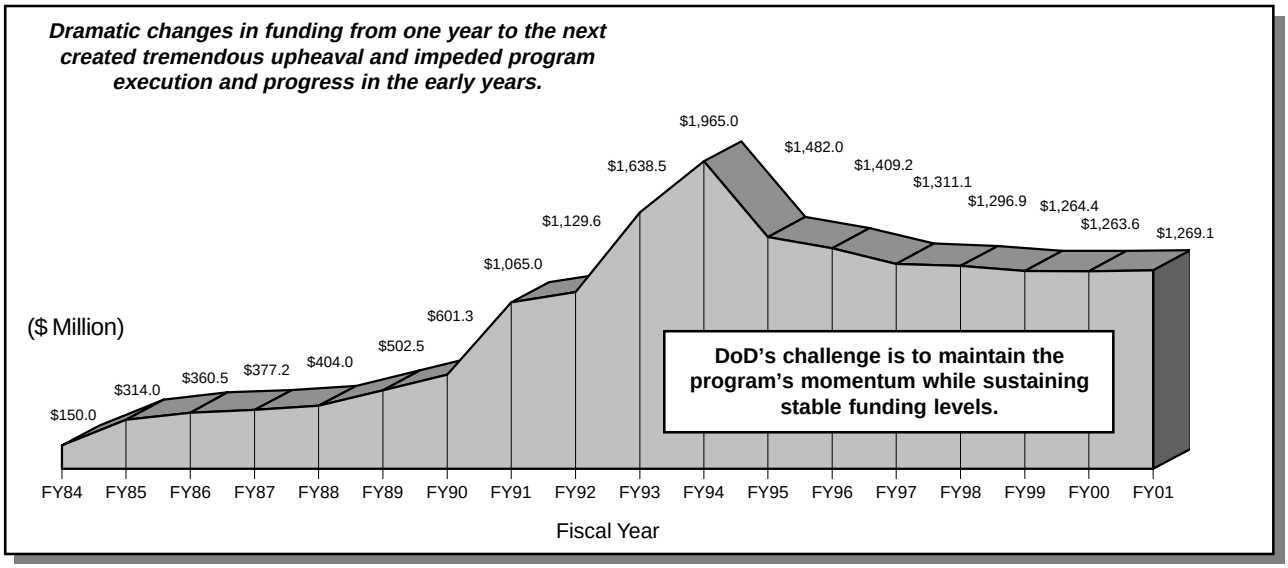
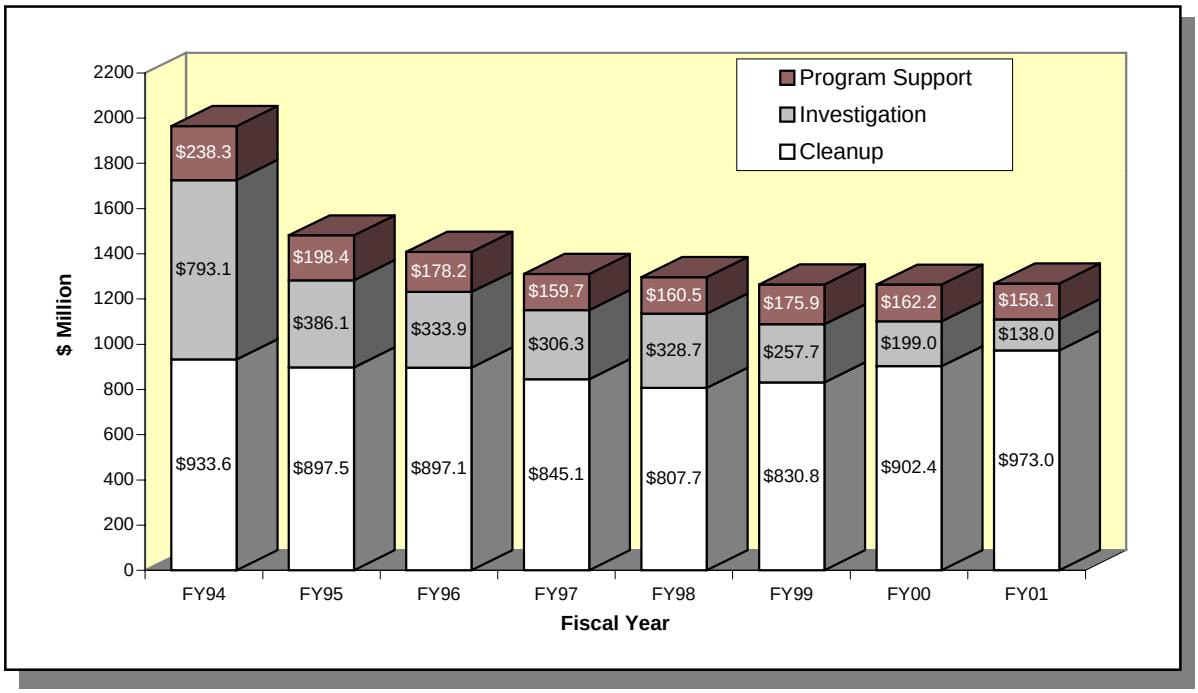


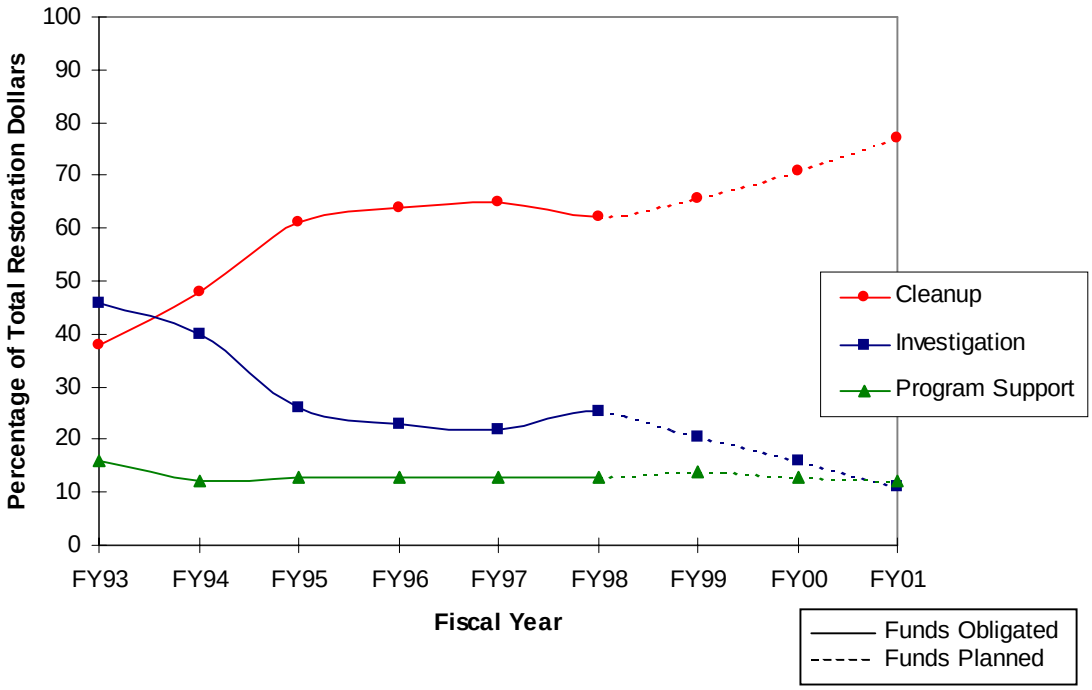
Figure 18
DERA/ER Funding Profile



installation sites to facilitate completing the installation's program in a holistic manner. Funding for cleanup decreased in FY98 as a result of increased investigation but still constitutes almost two-thirds of program funding. Funding for cleanup is projected to increase in future years as more of the investigated sites enter the more costly cleanup phase. In FY98, program support funding levels remained relatively stable.

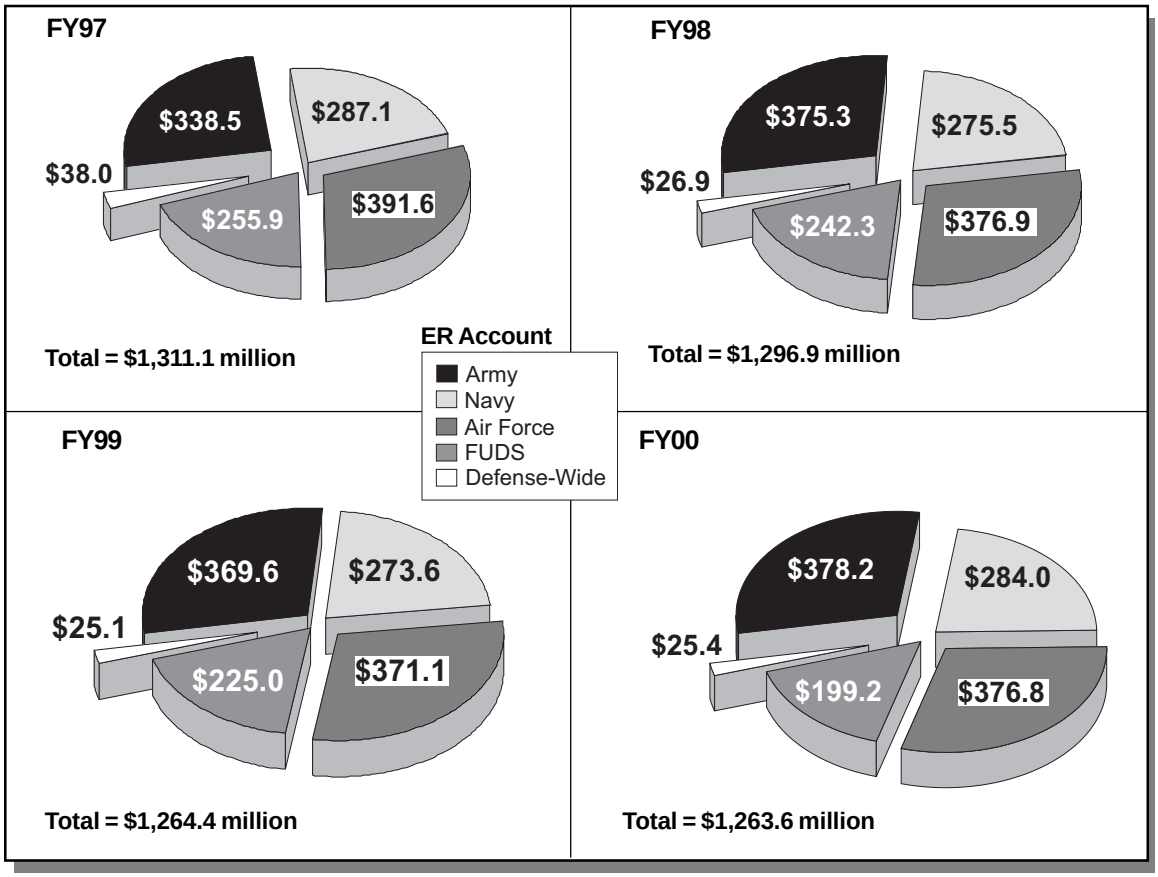
The funding profile in Figure 20 shows the actual and estimated funding levels for OSD and the Components in FY97, FY98, FY99, and FY00. For FY98, Congress appropriated $375.3 million for ER, Army; $275.5 million for ER, Navy; $376.9 million for ER, Air Force; $242.3 million for ER, FUDS; and $26.9 million for ER, Defense-Wide, which is predominantly DLA.

Figure 19
DERA/ER Cleanup, Investigation, and Program Support Obligations and Planning Estimates



Category	Millions of Funding Dollars Obligated/Planned (% of Total Obligated/Planned Funds) FY96	FY97	FY98	FY99	FY00	FY01
Studies & Investigations	$334 (24)	$306 (23)	$329 (25)	$258 (20)	$199 (16)	$138 (11)
Program Support	$178 (13)	$160 (12)	$161 (13)	$176 (14)	$162 (13)	$158 (12)
Total Non-Cleanup Funds	$512 (36)	$466 (35)	$489 (38)	$434 (34)	$361 (29)	$296 (23)
Cleanup	$897 (64)	$845 (65)	$807 (62)	$831 (66)	$902 (71)	$973 (77)
TOTAL DERA/ER FUNDING	**$1,409**	**$1,311**	**$1,297**	**$1,264**	**$1,264**	**$1,269**

Figure 20
Environmental Restoration Funding Profile for OSD and Components
(in millions of dollars)



Long-Term Projections—Active Installations and FUDS

Extensive up-front planning and continuous dialogue with stakeholders form the basis of DoD's strategy for continuing a strong cleanup program. This section identifies the cost-to-complete estimate requirements for each relative risk category and program phase.

Tables 7 and 8 show the estimated cost to complete the program, by relative risk category, for DoD and each Component. For sites in the high relative risk category, the Army has the highest estimated cost, at just over $4 billion to complete. Most of the Components estimate that the highest amount of funding will go to sites in the high relative risk category. For FUDS and DLA, however, the highest funding estimates are for sites in the not required category, which includes cost for long-term monitoring. The FUDS cost-to-complete estimate in the Relative Risk Evaluation Not Required category is very large compared with the Military Departments' estimate for this category because, unlike the Military Departments and DLA, FUDS have unexploded ordnance (UXO) and BD/DR as a significant proportion of their requirements; these are not addressed by relative risk site evaluations and are not included in the other programs. Table 8 also shows relative risk cost-to-complete estimates, with totals by fiscal year instead of by Component. In the short term, all Components estimate that the highest amount of funding will go toward sites in the high relative risk category to ensure the reduction of risks to human health and the environment.

Table 7
Active Installation and FUDS Property Cost-to-Complete by Relative Risk Site Evaluation Category and Component (FY99-Complete)

Relative Risk Category	Cost-to-Complete ($000)					
	Army	Navy	Air Force	DLA	FUDS	Total
High	4,150,128	1,856,272	2,197,031	32,645	1,081,783	9,317,859
Medium	793,727	482,712	474,141	8,871	310,099	2,069,550
Low	411,733	253,092	412,423	11,864	68,934	1,158,046
Not Evaluated	41,891	93,998	63,278	13,008	919,787	1,131,962
Not Required	503,626	450,781	569,507	53,677	2,539,095	4,116,686
Total	$5,901,105	$3,136,855	$3,716,380	$120,065	$4,919,698	$17,794,103

Table 8
Active Installation and FUDS Property Cost-to-Complete by Relative Risk Site Evaluation Category and Fiscal Year for all DoD (Army, Navy, Air Force, Defense-Wide, FUDS)

Relative Risk Category	Cost-to-Complete ($000)							
	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06-Complete
High	600,632	715,256	742,747	707,698	715,471	692,260	635,218	4,508,577
Medium	104,909	93,122	90,939	81,185	75,432	76,367	99,134	1,448,462
Low	70,680	62,931	70,868	75,277	67,951	70,782	59,708	679,849
Not Evaluated	47,001	10,459	7,297	15,436	13,033	22,805	17,793	998,138
Not Required	219,697	186,136	158,485	157,783	163,783	147,592	151,567	2,945,337
Total	$1,042,919	$1,067,904	$1,070,336	$1,037,379	$1,035,670	$1,009,806	$963,420	$10,580,363

Another way of viewing DoD's cost-to-complete estimates is by cleanup phase. Where the relative risk tables (Tables 7 and 8) show how DoD plans to allocate its funding to address sites of concern first, Tables 9 and 10 show how DoD plans to distribute funding through the cleanup process. As Figure 1 showed, cleanup encompasses design, remedial action construction, and remedial action operation. Most of the remaining sites in the Environmental Restoration Program are in the cleanup phases of the process, and the funding is concentrated on these phases. As Table 9 indicates, this is the case for every Component. Also, over the short term, Table 10 shows how more environmental restoration funding is planned to go toward cleanup than toward any other phase.

Table 9
Active Installation and FUDS Property Cost-to-Complete by Phase Category and Component (FY99-Complete)

Phase Category	Cost-to-Complete ($000)					
	Army	Navy	Air Force	DLA	FUDS	Total
Analysis	287,403	403,431	346,920	1,253	566,362	1,605,369
Design	160,150	130,213	62,709	1,315	209,391	563,778
IRA	137,987	427,699	437,798	0	28,624	1,032,108
RA-C	2,986,371	1,230,675	688,435	35,101	3,411,892	8,352,474
RA-O	1,532,988	642,689	1,556,838	71,156	568,507	4,372,178
LTM	796,206	302,148	623,680	11,240	134,922	1,868,196
Total	$5,901,105	$3,136,855	$3,716,380	$120,065	$4,919,698	$17,794,103

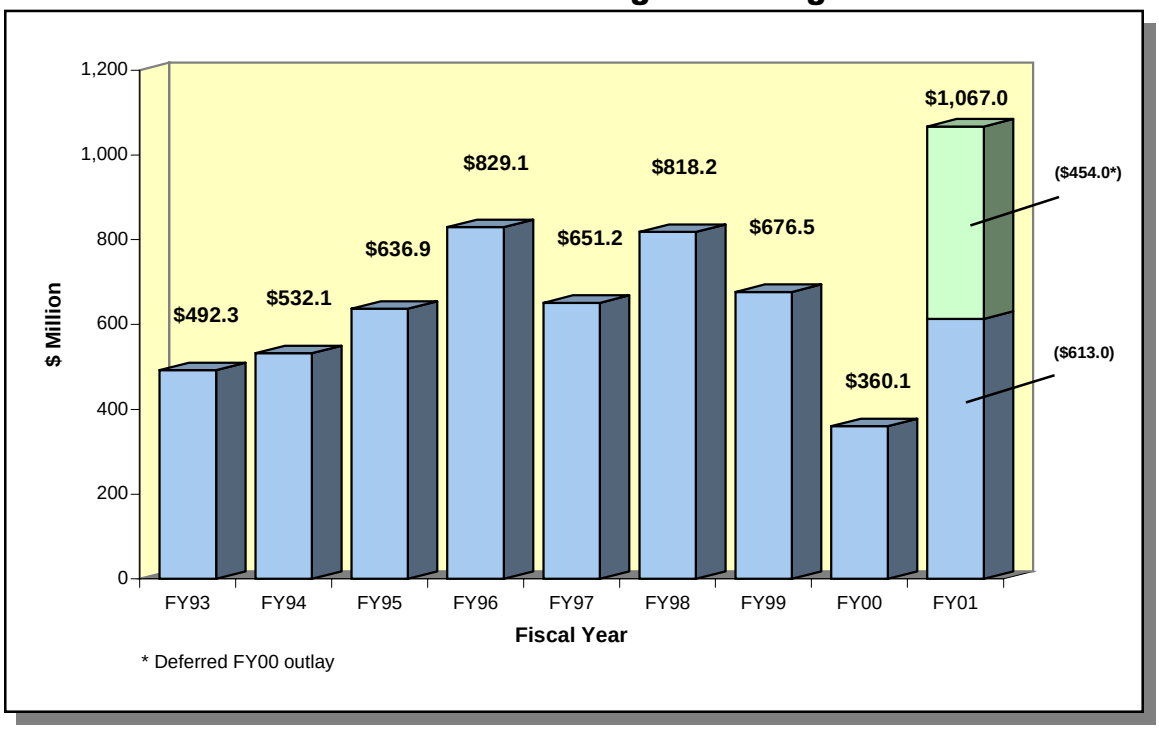
Table 10
Active Installation and FUDS Property Cost-to-Complete by Phase Category and Fiscal Year for all DoD
(Army, Navy, Air Force, Defense-Wide, FUDS)

Phase Category	Cost-to-Complete ($000)							
	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06-Complete
Analysis	241,292	193,586	128,705	79,567	83,114	89,701	120,163	669,241
Design	46,706	66,425	68,383	43,586	25,299	31,850	27,188	254,341
IRA	168,964	135,660	129,170	95,908	80,614	89,335	71,615	260,842
RA-C	420,342	490,880	542,667	577,330	559,620	484,830	414,671	4,862,134
RA-O	113,245	109,119	131,627	161,699	202,057	209,299	212,332	3,246,494
LTM	52,370	72,234	69,784	79,289	84,966	104,791	117,451	1,287,311
Total	$1,042,919	$1,067,904	$1,070,336	$1,037,379	$1,035,670	$1,009,806	$963,420	$10,580,363

BRAC Account Status

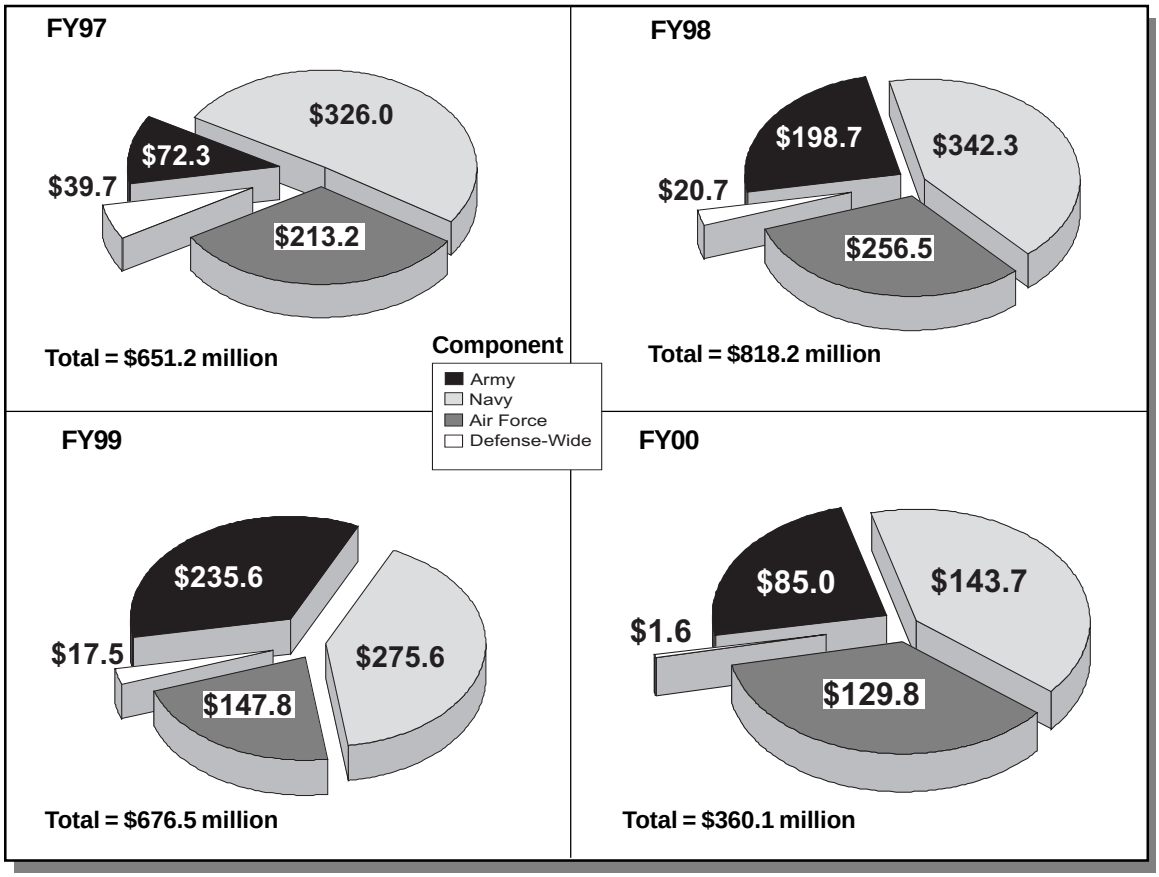
The overall BRAC account, which is part of the Department's total military construction account, funds BRAC environmental restoration efforts. The BRAC account, in addition to funding environmental requirements (restoration, compliance, and planning) funds other BRAC requirements such as BRAC-specific military construction and family housing. BRAC environmental funding has increased over the years with the addition of new installations in each of the four BRAC rounds—BRAC 1988, BRAC 1991, BRAC 1993, and BRAC 1995. The BRAC environmental funding profile in Figure 21 shows actual and projected total environmental funding allocations from FY93 through FY01. The estimated cost to complete for the remaining environmental restoration activities at BRAC sites after FY01 is $1.9 billion.

Figure 21
BRAC Environmental Budget Funding Profile



The BRAC environmental funding profile in Figure 22 displays the actual and projected total BRAC environmental funding for each Component. BRAC funding in FY98 increased substantially, almost 20 percent, from FY97 levels. The year-to-year environmental funding fluctuations within the BRAC account occur due to the addition of new installations with each BRAC round. In addition, as each round progresses through environmental planning and site identification, DoD must balance environmental requirements with other BRAC requirements (i.e., BRAC military construction, family housing, and program management and support). The funding level in FY00, along with the advance appropriation request for FY01 is $814 million.

Figure 22
BRAC Environmental Funding Profile for OSD and Components
(in millions of dollars)



The proposed President's Budget for FY 2000 specifies this one-time change in DoD's business practices and contracting philosophy to incrementally fund environmental restoration work in FY00 and FY01. The President's Budget contains a proposal that requests $360.1 million in FY00 to cover actual expenses and an advance appropriation of $454.0 million in FY01 to fund all projects that will begin in FY00. This business practice change also affects the entire military construction (MilCon) and family housing construction appropriations. Implementation will require incremental funding for specific contracts. Currently, the Research, Development, Test & Evaluation account incrementally funds contracts and will serve as a model for implementing cleanup contracts.

Incremental funding of projects means that obligations (contract or task awards) would coincide with the work actually performed and billed in FY00. Termination liability funding will also be obligated in FY00. Previously, all appropriations included total funding for entire projects that usually spanned more than one fiscal year.

The funds requested in the FY 2000 proposed President's budget are adequate to fund all BRAC environmental cleanup work and keep projects on schedule. It is important to remember that the BRAC environmental program represents a small portion of DoD's overall military construction budget and that this measure was not intended to single out BRAC environmental programs. DoD remains fully committed to meeting the President's fast-track cleanup initiative and to adequately funding BRAC environmental cleanup work.

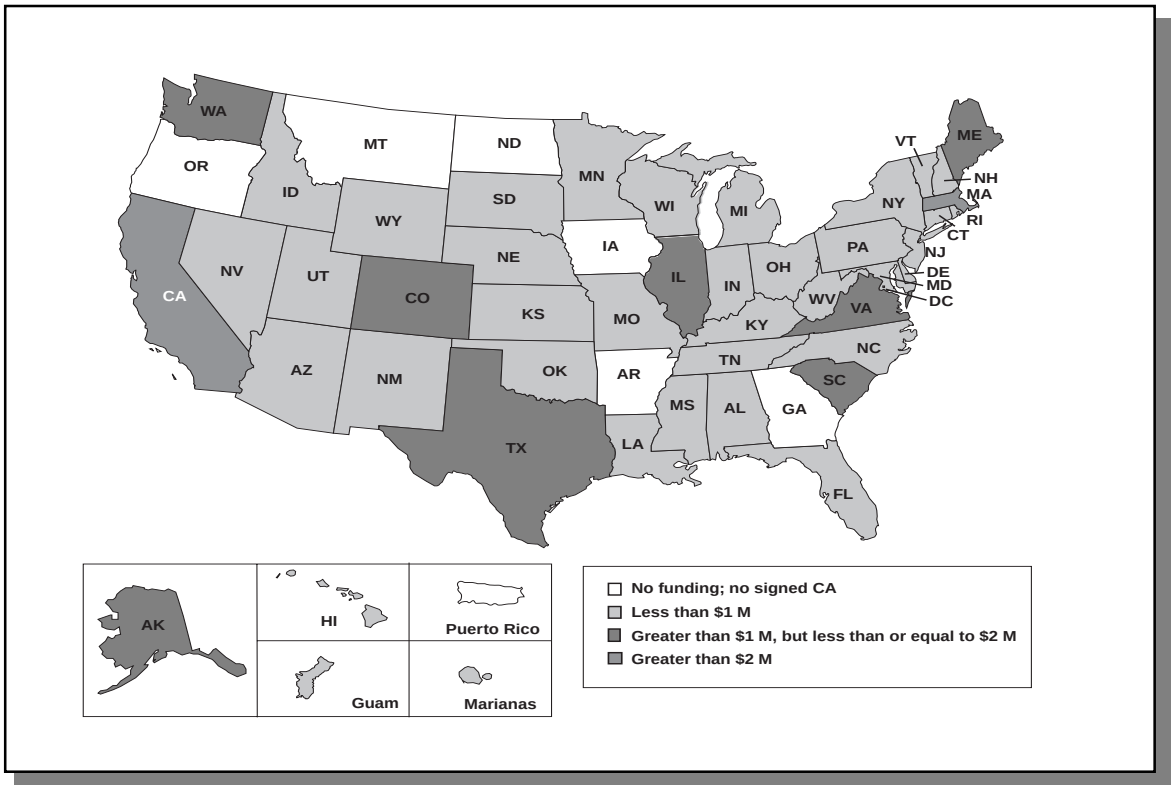
Support for States and Territories to Expedite Regulatory Review

The Defense and State Memorandum of Agreement (DSMOA) is a formal agreement used to foster partnerships between states and DoD. The Superfund Amendments and Reauthorization Act, enacted in 1986, established the DSMOA program to reimburse states and territories for reviewing investigation and cleanup efforts at DoD facilities. States have helped DoD avoid millions of dollars in cleanup costs by suggesting innovative cleanup methods, focusing the amount of sampling or analysis required, reviewing documents expeditiously, and openly exchanging information on transferring technologies. A DSMOA represents a commitment between DoD and a state or territory, but DoD does not transfer any funds until both the state and DoD sign a cooperative agreement (CA). The cooperative agreement provides a specific 2-year plan for restoration activities in the designated state or territory, provides a projection of activities for the following 4 years, and establishes a process for payment. At this time, 50 of the 56 possible states, territories, and the District of Columbia have signed DSMOAs, and 45 have entered into cooperative agreements with DoD. DoD expended approximately $48 million for the DSMOA program in FY98, as shown in Figure 23. Appendix C provides more information concerning specific DSMOA and CA programs.

The Army Corps of Engineers, the DoD executor of the DSMOA/CA program, redesigned the CA process in FY97 to address two major issues: the need for consistency in preparing the CA application and devolvement of DERA into several accounts. The goal of the new CA process is to standardize and simplify procedures so that the DSMOA program can operate more efficiently and effectively. FY98 was the first year under the new process. Figure 24 shows the six steps in the process.

State services that qualify for reimbursement through CAs include, but are not limited to, technical review, comments, and recommendations on documents or data; identification and explanation of state or territorial requirements; site visits; participation in public education; and community involvement activities. This includes meetings of groups such as technical review committees (TRCs) and Restoration Advisory Boards (RABs); activities associated with the preparation and

Figure 23
DSMOA Reimbursements in FY98

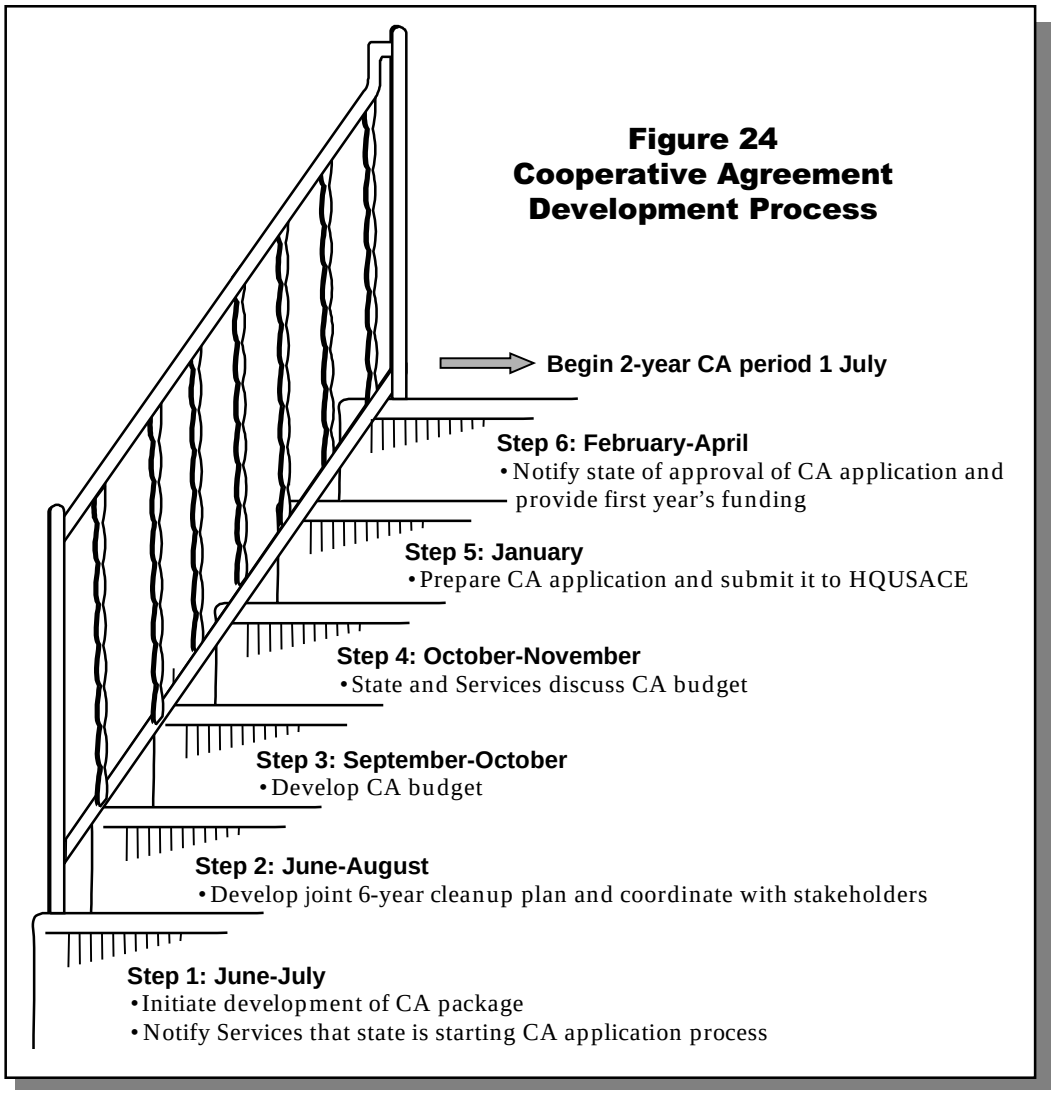


administration of the DSMOA / CA agreement; and other state or territorial services enumerated in installation-specific agreements.

The DSMOA program applies to all active and closing installations, beginning at the site identification stage and continuing through site closeout. The DSMOA program also covers FUDS, if DoD determines the site is eligible for ER funding. The *Guide to the Cooperative Agreement Process* provides more detailed information about the requirements and restrictions of the program.

WorldWideWeb

DSMOA Home Page
http://www.environmental.usace.army.mil/environmental/access/dsmoa.html



Assessing the Health Impact of Contamination

The Agency for Toxic Substances and Disease Registry (ATSDR), a branch of the U.S. Public Health Service, is charged under CERCLA with assessing the presence and nature of health hazards at specific NPL sites and in response to citizens' petitions. The agency's efforts help prevent or reduce further human exposure to hazards and the illnesses that result from such exposure, and expand knowledge about the health effects caused by exposure to hazardous substances. As part of its congressionally mandated duties under CERCLA, ATSDR independently performs public health assessments (PHAs) at DoD sites that are on the NPL or that are the subject of a citizen's petition. If additional information becomes available to ATSDR that changes the PHA presented in the final release document, ATSDR issues an addendum to the PHA in

the form of technical assistance, a health consultation, a site review and update, or a PHA addendum. In accordance with the "Guidelines for the Coordination of CERCLA Activities between ATSDR and DOD," ATSDR reviews DoD response actions to ATSDR's recommendations to ensure the protection of public health through the PHA process. There are three stages in the assessment process:

- Initial Release Document. Provides DoD, state and federal regulatory agencies, and state and local public health departments with the opportunity to ensure that the most accurate and relevant information about the site is available to ATSDR.
- Public Comment Release. Provides a formal mechanism through which the community can provide additional comments and express its concerns, thereby furthering stakeholder involvement in the process.
- Final Release Document. Responds to citizens' concerns and to comments by DoD, the regulatory agencies, public health departments, and the community. This document is the final independent public health assessment of the site by ATSDR.

ATSDR establishes a Community Assistance Panel (CAP) to provide information to the community on complex PHAs and ongoing public health actions, especially health studies. The CAP acts as a liaison to provide information to ATSDR about community concerns and to provide feedback to the community on health-related actions completed by ATSDR, the state, the local health department, or DoD. A CAP normally consists of 12 to 15 community members who have an understanding and knowledge of the site, contaminants of concern, and the community health concerns. Currently, there is one CAP associated with a DoD site Massachusetts Military Reservation (MMR).

Table 11, below, summarizes the PHAs completed in FY98 (by the number of documents in each stage) at DoD installations. In addition, ATSDR completed two health studies, one at MMR and one at Camp Lejeune, and five DoD-specific toxicological profiles.

Table 11
Summary of FY98 Public Health Assessment

Stage of Assessment	Army	Navy	Air Force	DLA	FUDS	Total
Initial Release Document	2	5	13	1	1	23
Public Comment Release	3	5	12	2	2	24
Final Release Document	4	3	8	2	2	18
All Stages, Total Number	9	13	33	5	5	65

In FY98, ATSDR completed more PHA documents in one year than ever before. The number of completed documents was equal to the number of documents completed in the previous three years combined. DoD and ATSDR partnered to streamline the

document review process and decrease review times. In addition, ATSDR used its state cooperative agreements and contract support to augment its staff and improve productivity.

* * * * *

Perhaps more than any other element of the restoration program, DoD's efforts to report meaningfully on our progress show how we build trust by doing the right thing. Congress requires an annual report, but we do more because we believe we should. Making sure we use resources responsibly and making wise decisions about priorities mean the program receives thorough review at every level within DoD.

Accurately measuring performance and progress toward program goals is critical: data collection must ensure that results are meaningful, and reliable findings can indicate a need to change what data are collected. The Components strive constantly to perfect and refine their data collection systems, and OSD and the Components work together to analyze that collected information and use it to manage the program effectively.

Program Achievements

DoD's commitment to implementing initiatives to enhance and improve the Environmental Restoration Program is another way DoD builds trust with stakeholders by doing the right thing. This section highlights several DoD initiatives that help ensure that the job is getting done efficiently and thoroughly by—

- Increasing program effectiveness through process improvements such as partnering with regulatory agencies, reviewing remedies for effectiveness and cost-avoidance, and reviewing site management practices
- Cross communication of ideas and leveraging environmental cleanup technologies
- Involving community stakeholders in the cleanup process.

These initiatives are essential to the cleanup program's success and to ensuring that trust in the cleanup program remains strong.

Program Efficiencies

DoD constantly strives to increase its effectiveness in choosing the most appropriate remedy for each site and in performing cleanups to achieve regulatory closure. Use of

Cleanup Program in Action:
Fort Wainwright, Alaska

A unique teaming relationship between the Army and regulators at Fort Wainwright, Alaska, resulted in quick preventive measures to halt contamination of the Chena River. Historic operations at Fort Wainwright contributed to extensive soil and groundwater contamination, including solvent and petroleum / oil / lubricant (POL) plumes. Many abandoned fuel and sewer lines run through the site. In the 1950s, the Army installed a metal retaining structure, which prevented solvent and petroleum contamination from reaching the river. Seepage into the river was minimal until recent years when low water levels increased the amount of contamination flowing to the river. Initially, upon discovery of the increased contamination, booms were placed in the river to control the seepage. In 1998, the Army, EPA, and Alaska's Department of Environmental Conservation (ADEC) determined that the seepage needed better control, and further efforts to install a more permanent remedy began. The Army removed the metal retaining structure and installed a replacement containment structure at minimal cost. In the course of the project, the Army removed 650 cubic yards of soil. In addition, remedial efforts resulted in the recovery of over 1,700 gallons of product. The installation ultimately sold the recovered product, and the proceeds of the sale were returned to the installation. This project took place over a 6-week period and paved the way to a more permanent air sparging curtain system, which the Army will install to protect the river. By electing not to use a traditional pump-and-treat system, the Army saved more than $1.5 million. The strong partnership between Fort Wainwright, ADEC, and EPA, characterized by joint decision making and document drafting, ultimately resulted in more timely, inexpensive, and effective cleanup and pollution prevention.

voluntary agreements, peer review of remedies, leveraging of the Internet's communication capabilities, and optimization of final cleanup operation and monitoring are a few of the measures that DoD is exploring for improving the quality, speed, and cost-effectiveness of its implementation of the Environmental Restoration Program.

State Voluntary Cleanup Agreements

In FY98, DoD entered a groundbreaking voluntary cleanup agreement with the Commonwealth of Pennsylvania. The Components and the Pennsylvania Department of Environmental Protection (DEP) signed the agreement on July 17, 1998. The first of its kind, this agreement is intended to allow all parties to concentrate on achieving timely, cost-effective cleanup and signifies a commitment by all parties to focus on these goals. The voluntary cleanup agreement ensures structure, provides a measured pace, and ensures mutual accountability.

DEP Secretary James M. Seif joined representatives of the U.S. Departments of the Army, Air Force, and Navy and the Defense Logistics Agency in signing the first cooperative multisite agreement in the nation covering military installations. The agreement was signed in a ceremony at Willow Grove Naval Air Station on July 17, 1998.

The agreement offers incentives for all parties by requiring joint planning, use of innovative technology, public participation, and the sharing of resources to enhance the state–federal relationship. In addition, the agreement reflects DoD's commitment to cleaning up sites to regulatory levels and to having cleanups quickly approved by the state in order to avoid the high costs associated with long-term cleanup negotiations. The Commonwealth receives assurance that the military will conduct cleanup activities on a specified schedule — which ensures that the money is in place. Once the Commonwealth determines that DoD has achieved the requirements of the agreement for a given site, the military is released from further environmental liability.

This landmark agreement illustrates DoD's belief that building relationships with states to achieve site cleanup benefits all parties. The benefit to the citizens of Pennsylvania is the earlier return of cleaned up sites to economically valuable reuse; the benefit to DoD is faster and less costly completion of cleanup — and reaching program completion sooner. DoD plans to use this agreement with Pennsylvania as a model for voluntary agreements with other states.

Peer Review

Peer review, in which a panel of experts evaluates site cleanup alternatives, is an important part of choosing a final cleanup remedy. DoD uses peer review to apply institutional and industry knowledge to ascertain which cleanup remedies and site investigation activities are both protective and cost-effective. The Air Force was the first Component to establish a peer review process, and all Components now use it in some form. The Army refers to its process as Independent Technical Review; the Navy calls its review panels Tiger Teams.

Cost avoidance is one benefit of the peer review process. Analysis of the most recent remediation techniques for a particular situation can help avoid unnecessary costs. The Army's BRAC Independent Technical Review resulted in avoiding approximately $39 million to date.

DoD is working with EPA and state regulators, along with communities, to improve the timeliness of peer review in the regulatory consultation and public dialogue processes.

Communication Over the Internet

DoD's Environmental Cleanup Home Page presents general information about the DERP. This Internet site contains information on DERP policies, guidance, BRAC cleanup, public involvement, small business, related publications, and conferences, as well as links to the Component Internet sites and other related Internet sites. This report and previous DERP annual reports can also be found on-line.

WorldWideWeb

DoD's Environmental Cleanup Home Page
http://www.dtic.mil/envirodod

The Components' Internet sites provide general information about Component programs; information on installation status, policies, and guidance; fact sheets; technology descriptions; staff directories; comment forms; links to other sites; and more. In general, Component sites are useful to both project managers in the field and interested citizens. (See Appendix G for the Components' environmental Internet site addresses and other related links, such as EPA.)

To enhance the communication of information within DoD, the Department created the Defense Environmental Network & Information eXchange (DENIX). DENIX provides DoD environmental managers with a central communications platform from which to obtain timely access to environmental legislative, compliance, restoration, cleanup, and DoD unique information. Easy access to this information through the Internet helps these managers ensure compliance, avoiding costly fines and protecting DoD's training and operating missions. DENIX allows users to read on-line environmental publications (proprietary or DoD-specific); send and receive mail electronically on the DENIX host computer or across the Internet; exchange environmental information via managed discussion forums based on a subject area; send

and receive required reporting data through the chain of command; peruse and request environmental training courses and seminars; access the DENIX directory service database; and upload and download files to and from a personal computer. DENIX served over 6,000 DoD users during 1998.

DENIX
http://www.denix.osd.mil

Optimization of Final Cleanup Phases

As sites move through the cleanup process**,** some may require significant operational activities and monitoring to ensure the continuing effectiveness of the cleanup remedy. Optimization of the operation of selected remedies (RA-O) and of any long-term monitoring (LTM) offers the potential for notably increasing the efficiency and cost-effectiveness of the remedy.

To ensure optimum effectiveness of the remedy once it is in place, the review and update of operations at RA-O sites should occur periodically according to optimization guidance principles. Every program is unique, however, and it is necessary to tailor the optimization process to the specific conditions of each site and its needs. Formal five-year reviews offer a convenient vehicle for optimization; however, supplementing this by conducting reviews continually on an informal level is useful. If an evaluation team discovers during the optimization process that the remedy is inadequate, modifications can occur immediately to save money and ensure cleanup effectiveness.

LTM, which occurs after sites move into the response complete category, helps confirm the success of cleanup remedies. This monitoring is an essential part of the environmental restoration process. Recent tools, such as the Air Force Center for Environmental Excellence's *Long-Term Monitoring Optimization Guide*, advocate establishment of an ongoing LTM optimization program to maintain maximum monitoring effectiveness.

Long-Term Monitoring Optimization Guide
http://www.afcee.brooks.af.mil/er/erproducts.htm

Estimated time periods for such monitoring are difficult to predict. In some cases, the monitoring may have to continue indefinitely (e.g., at landfills). Therefore, the efforts and costs associated with LTM represent a substantial future investment for DoD.

Environmental Technology

Once DoD establishes the need to clean up a site on an installation or property, it must select a "remedy" to address potential risk to human health and the environment — and return the property to safe and productive use. The use of advanced technologies, and the development of new technologies, can substantially speed up

cleanup, increase cleanup effectiveness and reduce life-cycle costs of the environmental cleanup program.

DoD is committed to developing and fostering the use of new technologies to solve the military's unique contamination problems such as unexploded ordnance. DoD also strives to ensure that technologies are used appropriately and in areas where they will do the most good. To ensure the application of the most effective and appropriate cleanup technologies (and the appropriate allocation of resources), the military components first identify their environmental cleanup technology requirements depending on site-specific and DoD-wide needs. DoD identifies environmental technology needs by the following process:

- Components identify environmental technology needs by prioritizing problems identified by the installations.
- Technology needs are validated for technical soundness and become candidates for research and development if no appropriate technology exists or is under development.
- The science and technology community develops project and program proposals based on a prioritized list of technology requirements.

To address DoD-wide needs, the grouping and sorting of technology requirements occurs through joint-service technology committees, such as the Strategic Environmental Research and Development Program (SERDP). SERDP is a tri-agency cooperative program involving DoD, the Department of Energy (DOE) and EPA. Congress established SERDP in 1990 to capitalize on the capabilities of the national laboratory system and the private sector and thus to leverage other federal investments to meet environmental remediation challenges.

As projects emerge from the research and development phase, they move toward implementation through DoD's demonstration and validation programs, such as the Environmental Security Technology Certification Program (ESTCP). Similar to SERDP, ESTCP is DoD's corporate demonstration-validation program. ESTCP's goals include demonstrating and validating innovative environmental technologies under real-world conditions, addressing the most urgent DoD environmental needs, and promoting the rapid implementation and use of advanced environmental technologies.

Building Technology Partnerships and Sharing Information

New, more effective technologies hold great benefits for DoD's cleanup program. To ensure that DoD is in the mainstream of technological progress, DoD participates in technology-related conferences, symposia, and workshops. The sharing of this information is also very important. To provide easy access to technology news and related work groups, each Component has its own Web sites. Through learning more about technological progress, and through sharing both successful and less-than-successful experiences with other groups, DoD is working to expedite and improve its cleanup program. The following subsections describe these groups and their activities.

The Federal Remediation Technologies Roundtable

The Components work closely with each other, as well as with the public and private sectors, to foster technology innovation. One example of such cooperation is the Federal Remediation Technologies Roundtable (FRTR)—an interagency working group that identifies and publicizes solutions to the federal government's hazardous waste challenges. To date, this group has focused on the exchange of information on innovative hazardous waste characterization, monitoring, and treatment technologies. The work group has evaluated, documented, and published more than 140 remediation technology case studies drawn from cleanups at federal sites. These case studies provide in-depth information for field-level environmental professionals.

WorldWideWeb

FRTR Internet site
http://www.frtr.gov

Selecting a cleanup technology is difficult because information is scattered throughout multiple sources and is constantly changing. To address this issue, in FY98 the U.S. Army Environmental Center (USAEC) led an effort to update the *Remediation Technologies Screening Matrix and Reference Guide* under the auspices of the FRTR. This screening matrix and guide is a "living" document that consolidates masses of related and overlapping information needed for evaluating alternative technologies. Although the guide is not intended as a sole source of information that remedial project managers (RPMs) will rely on in selecting remedies, it does provide a convenient compilation of information on commonly recognized technologies that RPMs can use to perform an improved, direct, guided search. The most recent guide's availability on the Internet offers many additional advantages—the size of the guide is not a limiting factor; references in the guide can be linked to other government and private Internet pages; future updates will be less expensive and time consuming; and links to other information source are easily updated (no need to reprint a paper version every time a new link is added).

WorldWideWeb

Federal Remediation Technologies Roundtable Remediation Technologies Screening Matrix and Reference Guide, Version 3.0
http://www.frtr.gov/matrix2/top_page.html

Joint Service Technology Sharing Efforts

To further facilitate the sharing of environmental technology information, the U.S. Army Environmental Center, the Air Force Center for Environmental Excellence, and the Naval Facilities Engineering Service Center have formed a Tri-Service Environmental Support Center Coordinating Committee. This committee meets three times a year and includes representatives from the Components. The Components also participate in a joint technology demonstration project through ESTCP and SERDP. Technology demonstrations involve representatives from multiple services and other government agencies. The Services' technology execution staffs also meet frequently to share information on implementation successes and failures.

Interstate Technology and Regulatory Cooperation

The Interstate Technology and Regulatory Cooperation (ITRC) Working Group is led by state regulators and focuses on reducing state barriers to the deployment of innovative hazardous waste technologies. To achieve this goal, ITRC has partnered with federal agencies, including DoD, EPA, and DOE; stakeholders; and representatives of the environmental industry. By acting as a network for state regulators, federal agencies, vendors, and consultants, ITRC helps leverage limited resources to enhance and encourage the use of innovative technologies.

ITRC helps to expedite the acceptance of new technologies by producing guidance documents that provide uniform data requirements for technologies such as soil washing, electrokinetics, phytoremediation, low-temperature thermal desorption, permeable barrier walls, and natural attenuation. To date, ITRC has 24 final or near final guidance documents that are helping to standardize the technology approval process across states. Preliminary analysis indicates that the use of ITRC guidance documents in approving technologies reduces the time needed to complete the regulatory approval process by as much as 20 percent.

Following soil removal of source contamination at Tobyhanna Army Depot, the EPA, the state, and the Army selected natural attenuation as the appropriate remedy for the site. This remedy will avoid the expenditure of approximately $7.5 million for conventional treatment.

ITRC developed and sponsored a training course on natural attenuation of chlorinated solvents. To date, more than 750 state regulators from 43 states have taken the course. Attendance at the course helped one regulator from Kansas identify a classic biodegradation pattern within a chlorinated solvent plume on an active Army installation in his state. By understanding the evidence before him, he could then support the Army's recommendation of natural attenuation as a primary cleanup remedy for groundwater contamination at the site. If properly applied, natural attenuation could be used as a complete remedy at approximately 15 percent of the nation's chlorinated solvent–contaminated sites, resulting in cost avoidance of as much as $7.8 billion.

Cleanup Program in Action:
Naval Air Weapons Station Point Mugu, California

Naval Air Weapons Station (NAWS) Point Mugu, California, has received several awards from the Chief of Naval Operations for environmental cleanup, environmental quality, natural resources conservation, and cultural resources management. The station received this recognition in large part because of its prudent use of innovative solutions to clean up a unique and fragile habitat on the installation.

Because of its lack of commercial development, NAWS Point Mugu is home to a wide variety of wildlife, including endangered species. The environmental staff at NAWS Point Mugu use solutions that protect these species and their environment and support the station's risk-reducing SMART (Saves Money / Alleviates Risk / Timely) objectives. For example, the station performs cleanup work within specified, limited time windows to avoid disrupting the nesting and mating seasons of endangered migratory birds. In addition, the station's wildlife biologists and archaeologists monitor site cleanup work when warranted, develop ecological risk-based cleanup goals, and integrate natural resource management techniques into cleanup designs.

In 1998, NAWS Point Mugu performed removal actions at 14 sites, restoring 12 acres of wetland and enhancing another 29 acres. NAWS Point Mugu also partnered with the Army to demonstrate a technology for cleaning up metal-contaminated soil on one site. According to estimates by the U.S. Army Corps of Engineers, this technology could reduce costs by 40 to 90 percent compared with such conventional cleanup technologies as excavation and off-site disposal.

Cleanup Program in Action:
McClellan Air Force Base, California

Fostering relationships with other federal organizations, state regulatory agencies, and the public is helping McClellan Air Force Base (AFB) reach environmental goals. McClellan's Environmental Management Directorate has always tried to keep information and ideas flowing. By organizing teams comprising regulators, the public, and base experts, the directorate was able to achieve outstanding successes in 1998.

McClellan has negotiated a soil cleanup model with regulators. Other DoD installations in California are now adopting this model. A further simplified document review process achievement, enabled McClellan AFB to complete three site-specific soil vapor extraction Engineering Evaluation and Cost Analysis documents in 1998.

Implementing Innovative Technologies

A common remediation challenge found at military installations is metal contamination in soil. DoD frequently evaluates new environmental cleanup technologies for addressing such contamination. The U.S. Army Environmental Center and the U.S. Naval Facilities Engineering Service Center jointly demonstrated the process of physical separation combined with acid leaching for removing heavy metals from range soil. Physical separation capitalizes on the density differences between metals and soil. When

contaminated soil is suspended in water, the denser metals settle out for collection and recycling. Acid leaching dissolves and washes metals from the clay fraction of soil. This technology has the potential for saving DoD millions of dollars. For a processing load of 10,000 tons of soil, physical separation and acid leaching costs approximately $168 per ton, compared with $200 per ton for stabilization and $300 per ton (plus a $40 per ton transportation charge) for landfilling the soil. In addition, DoD can sell lead recovered from the separation and leaching process to a smelter for about $300 per ton.

Cleanup Program in Action:
Marine Corps Air Station, El Toro, California

Through a cooperative arrangement between the Marine Corps and the Air Force, the Marine Corps Air Station (MCAS) El Toro obtained soil vapor extraction (SVE) treatment system equipment from Norton Air Force Base. The Air Force successfully used the SVE unit for its cleanup at Norton before transferring it to the Marine Corps. MCAS El Toro is using the SVE unit to remediate soil contaminated with solvents and gasoline. The use of the SVE unit at MCAS El Toro should shorten the length of the cleanup project by 6 months and save $1.1 million in cleanup costs. Once the SVE treatment is near completion and the use of the equipment is complete, the Navy plans to reuse the SVE unit at other Navy and Marine Corps installations upon request.

Community Involvement

Community involvement in DoD's environmental cleanup efforts remains a strong component of the Environmental Restoration Program. The Restoration Advisory Board (RAB) is the major vehicle for involving citizens who live on or near a military installation or FUDS property in the cleanup process. RAB members play an active role in DoD's cleanup planning process, helping develop partnerships between DoD and the community and often providing input and advice on cleanup activities. Such input and advice from RABs help DoD conduct environmental cleanup activities in a timely and cost-effective manner while taking community concerns into account.

Restoration Advisory Boards

Included as a supplement to this report, the *RAB Report to Congress for Fiscal Year 1998* presents the RAB program in detail. Located at the back of this report, this supplement summarizes the status of DoD's RAB program and the Technical Assistance for Public Participation (TAPP) development efforts for FY98.

RABs complement other community involvement activities that take place at a military installation. These community involvement activities include holding public meetings, preparing and distributing informational mailings, establishing local information repositories, and conducting local school visits to discuss the cleanup program and associated activities. The RAB program provides a major conduit for installation cleanup information between DoD and the community.

RABs bring together people who reflect the diverse interests of a community and can help identify issues of concern regarding an installation's cleanup program. Begun in 1993, the RAB program is now well established at many active, closing, and realigning military installations and FUDS properties. In FY98, 340 military installations and FUDS properties in the United States and its territories participated in RABs. According to data received from installations, DoD spent approximately $4.6 million on RAB administrative activities during FY98.

In FY98, the number of RABs increased by 12, a smaller increase than in previous years; however, a majority of the installations with interest in RABs have already established them. RAB expenditures in FY98 decreased by $0.3 million from FY97 for several possible reasons: installations established fewer RABs; DoD is conducting fewer RAB training activities than in the early years of the program; and at some closing installations, the RABs elected to decrease the level of activity because cleanup issues and concerns have been addressed.

Technical Assistance for Public Participation

The Technical Assistance for Public Participation program allows installations to provide contracts for independent technical assistance to community RAB members. Its purpose is to improve the RAB's understanding of the technical remediation issues at the installation and improve public involvement in decision making. TAPP enables private sector sources to help community members understand the scientific and engineering issues underlying an installation's environmental restoration activities. This assistance fosters increased citizen trust, confidence, and involvement. Typical projects may encompass a review of proposed remedial technologies, interpreting health and environmental effect data, or reviewing restoration documents.

The final TAPP rule, published on February 2, 1998, allowed DoD to begin implementing the TAPP program at the installation level. In FY98, five installations participated in the TAPP Program. DoD expects an increase in TAPP participation during 1999 as more installations learn about the benefits of the program.

WorldWideWeb

Final TAPP Rule

http://www.dtic.mil/envirodod/rab/63fr_tapp.html

Community Involvement Web Site

In FY98, DoD modified the Community Involvement Web Site to provide a central location through which interested parties can access information on issues associated with the installation restoration, BRAC, RAB, and TAPP programs and other cleanup-related topics. The enhancement of the Web site also should help increase the two-way communication between DoD, RAB members, and the public.

WorldWideWeb

Community Involvement Web Site
http://www.dtic.mil/envirodod/involve

Access to Installation Information

As required by CERCLA, each installation on the National Priorities List maintains an administrative record located near the installation for public access. The administrative record must contain all information and documentation used in the selection of a response action. This file must contain not only those documents relevant to the chosen response action, but also relevant comments and information, site-specific data, guidance documents, and technical references that DoD considered in the ultimate remedy selection decision.

For installations not on the NPL, the installation will still maintain a general information repository containing current information, technical reports, and reference documents regarding environmental restoration activities at the installation. The information repository is usually located in a public building that is conveniently accessible to local residents, such as a public school, city hall, or library.

* * * * *

The preceding section captures a few of the program's broadest accomplishments during the past year. Each page documents DoD's efforts to secure confidence and trust in the restoration program. Flexibility and openness to change are improving the program through sharing of lessons learned, adopting streamlining efficiencies, and pursuit of better technologies. Openness in communications and commitment to strong working relationships with stakeholders are advancing the program on many fronts. Innovative partnerships with states, technical peer review and community involvement activities all serve to improve the decisions we make. We believe these are the right things to do to make this the best program it can be, not just for DoD, but for everyone it affects.

Cleanup Program in Action:
BRAC Cleanup Team Workshops

In 1998, DoD sponsored three regional BCT Workshops. Each of the three Workshops included an informative main session along with several concurrent "tracks" focusing on technology, site closeout, cleanup, and policy topics. Attendees also participated in facilitated discussions that allowed time for communication among BCT members and sharing of lessons learned. In addition, attendees had a choice of two optional half-day sessions. One session provided introductory information for attendees who were new to BRAC cleanup and the other session featured a discussion on bioavailablilty, for the more experienced attendees. The workshops provided a forum where BCTs could learn about environmental cleanup policies, study new technical approaches, share lessons learned, and interact with their regional counterparts as well as headquarters representatives from DoD and EPA.

On the Horizon

DoD continues to encounter new issues and challenges in the Environmental Restoration Program. In response, DoD must issue policies and guidance, create criteria for prioritizing activities, reallocate resources, and develop management and oversight systems within the framework of the restoration program. This section discusses several challenges that DoD is facing and will continue to face over the next few years.

Unexploded Ordnance

Management of abandoned munitions and contaminated ranges is a major challenge for DoD. Unexploded ordnance (UXO) on closed, transferred, and transferring ranges poses a risk to public safety, health, and the environment. DoD is committed to taking appropriate cleanup, mitigation, and containment measures to adequately control these risks in a manner that is protective of human safety and the environment.

In FY98, as an early step in determining the most urgent UXO requirements, DoD began collecting data to identify the scope of the necessary UXO cleanup. DoD estimates that the range inventory will begin in late FY00, after the UXO data gathering process has been established.

Currently, only the FUDS program budgets for UXO requirements as an environmental restoration requirement. Component operations and maintenance accounts presently include the costs and other information associated with cleanup efforts at closed ranges on active installations. At BRAC installations, the Components have included UXO requirements in their environmental compliance budgets. In response to the recent Munitions Rule issued by EPA, which addresses UXO at active and inactive ranges, DoD plans to modify existing DERP policy to allow the Components to program and budget for UXO cleanup in the appropriate Environmental Restoration accounts. DoD proposed the Range Rule in September 1997 to establish a response and cleanup process for UXO at closed, transferred, and transferring military ranges. As DoD incorporates these recent policy changes, the Components will begin programming and budgeting for UXO cleanup at closed, transferring, and transferred ranges. Beginning in FY01, the Components will budget for UXO cleanup at closed, transferring, or transferred ranges in addition to their Environmental Restoration and BRAC requirements. These requirements will not include UXO cleanup at active ranges or at inactive ranges on active installations.

WorldWideWeb

Munitions Rule: 62 *FR* 6621-6657; February 12, 1997
Proposed Range Rule: 62 *FR* 50795-50843; September 26, 1997
http://www.access.gpo.gov/su_docs/aces/aces140.html (Federal Register Query Page)

One of the most difficult aspects of the UXO issue is the lack of proven UXO clearance technologies. DoD is extensively involved in efforts to develop, demonstrate, and transfer new technologies for UXO detection and clearance to expand the selection of UXO cleanup options. ESTCP, SERDP, and the congressionally mandated Advanced Technology Demonstrations at Jefferson Proving Ground demonstrated several UXO detection and characterization technologies in FY98. One of the projects, the Multi-Sensor Towed Array Detection System (MTADS), demonstrated that detection systems could routinely achieve UXO detection probabilities of greater than 95 percent. The biggest drawbacks of this and similar systems are a high rate of false alarms and a less than desirable ability to discriminate between UXO and nonhazardous clutter that does not pose any safety risk. Additional planned demonstrations will focus on better identification methods and discrimination of buried UXO under a wide range of ambient conditions. This research will continue into FY99.

An environmental remediation project at a post-World War II disposal site at Naval Air Station Adak involved the recovery and destruction of approximately 2,000 bombs (44 of which were leaking napalm).

The Defense Science Board estimates that there are an insufficient number of available, qualified UXO technicians to complete the required UXO remediation efforts. The board also concluded that the training conducted at the Naval School Explosive Ordnance Disposal was not structured to meet the full scope of UXO technician training requirements. The board recommended that DoD encourage and support the development of a private / public-based, non-DoD training capacity. To remedy the anticipated shortfall in trained UXO technicians, DoD instituted two projects:

- DoD established an Integrated Process Team (IPT), composed of Component, Corps of Engineers, and industry representatives, to define the core competencies required of all UXO technicians. The IPT issued a final draft report that establishes the skill sets required by UXO technicians at all levels.

- DoD is working in cooperation with industry to establish a baseline training curriculum for entry-level UXO technicians. The Texas Engineering Extension Service, at College Station, Texas, developed a training course for entry-level UXO technicians. DoD is currently evaluating and reviewing the course for certification.

DoD is also helping Native Americans address the UXO hazards on their lands. One such project currently under way is taking place at the Badlands Bombing Range. This project is part of a larger effort to assist Native Americans in dealing with environmental impacts on their lands. A selected group of Native Americans has received UXO training

and will enter an apprentice program with a UXO remediation company. The short-term objective is to empower the tribes with the internal capacity to remediate environmental impacts on their own lands. An additional, long-term benefit is empowering the tribes to develop the skills necessary to start a business capable of competing in the general marketplace.

Future of BRAC

The BRAC program will face new challenges resulting from the expiration of the BRAC account in July 2001 and potential new BRAC rounds. The Components have programmed funding to complete environmental restoration activities at BRAC installations after FY01, but the legal authority to spend environmental restoration funds at BRAC installations will expire with the BRAC account. DoD estimates that it will need approximately $1.9 billion to complete the remaining environmental restoration activities after FY01 so that property is suitable for transfer to local communities and economic revitalization can continue. DoD is considering several approaches, described below, to ensure that it meets all cleanup commitments at BRAC installations. This is the right thing to do for communities and others impacted by base closures and realignments.

- DoD submitted a legislative proposal to Congress that would establish a post-FY01 BRAC Environmental Account to provide a continuing funding source for cleanup of the existing BRAC installations. Establishing a new BRAC account is not expected to have an adverse budgetary impact, since the post-FY01 funding is currently planned and programmed in other accounts, and can be rolled over into this new account, along with any outstanding balances in the existing BRAC account. The proposed BRAC account will ensure that environmental restoration activities at existing BRAC installations will be completed.

- Congress will also consider a proposal to authorize additional rounds of base closures and realignments in 2001 and 2003 in an amendment to the Defense Base Closure and Realignment Act of 1990 (P.L. 101-510; 10 U.S.C. 2687). This legislation, if passed, will initiate a new set of installation closures and extend the BRAC account.

Site Closeout

For many years, management guidance for the environmental program focused on completing the studies and analysis necessary for making an informed decision about selecting and implementing environmental remedies. After more than a decade of DERP activities, however, the focus of the program is evolving, as many installations bring their cleanup efforts near to completion. Now that these installations have implemented selected remedies and are in the remedial action operation phase of their cleanups, the next important step is to consider the requirements for completing and documenting the closeout of sites once cleanup goals are met and other environmental responsibilities are fulfilled. Site closeout occurs when the community and the regulators

accept the achievement of the final remedy as ensuring their sustained health and environmental protection.

The site closeout process is still uncharted territory for those involved in cleanup, including the military community. Information on many key issues in the process is relatively limited. Strategies and guidance addressing these issues will evolve as more installations encounter the issues and gain experience in managing them. Some prominent topics include—

- Land use controls
- Optimization of remedial action operations
- Effective accomplishment of long-term monitoring
- Records management
- Natural resource injury assessment.

The Air Force Base Conversion Agency convened a working group to address site closeout issues, with representatives from the Military Departments, OSD, and EPA, in September 1997. The working group identified requirements for closeout of environmental restoration sites at military facilities, including active and closing bases, and developed a guide for meeting the requirements. This guide, *The Environmental Site Closeout Process,* consolidates the existing statutory and regulatory requirements affecting the closeout of sites under the DERP. DoD released the guide as an interim document in January 1999.

WorldWideWeb

The Environmental Site Closeout Process
http://www.afbca.hq.af.mil/closeout

Voluntary Cleanup Agreements

As described earlier in the report, the Pennsylvania multisite voluntary cleanup agreement establishes a model for voluntary cleanup agreements with other states. New Jersey and DoD are currently exploring the possibility of entering a similar arrangement. In addition, DoD plans to develop model multisite voluntary cleanup agreement language for use with other states and is working to identify at least three additional states as candidates for the next voluntary agreements. Our goal is to sign agreements with at least four states by 2001. In addition, DoD plans to work with EPA so that all types of sites (e.g., BRAC sites and sites on the National Priorities List, which are currently exempt from the Pennsylvania agreement) are included under these agreements. Finally, integration of voluntary agreements with the DSMOA is a fundamental objective.

Regulator Partnering

One of DoD's main priorities for 1999 is expanding and improving the quality of its partnering activities. Partnering fosters teamwork and promotes innovation, strengthening trust through mutual investment and reducing the cost and time (compared with an adversarial approach). DoD's partnerships with environmental regulatory agencies are essential to ensuring the success of environmental restoration activities.

DoD plans to work closely with regulators, especially EPA, to resolve any issues that delay cleanups. For example, DoD and EPA are working together through regulatory negotiation to develop a framework for addressing UXO. Regulatory negotiation brings together stakeholders to reach consensus before issuing a proposed rule. This process can be time consuming, but ultimately can *save* time and money by avoiding disagreements, litigation, and potential rewrites after finalization of the rule.

In addition to the issue of UXO at active and closing installations, UXO at former military ranges on FUDS properties could be a particularly serious problem. DoD transferred many of the more than 9,000 FUDS properties to private owners before the implementation of extensive investigation and site characterization requirements, leading to uncertainty about the extent of the problem on these properties. As with UXO at active and closing installations, partnering with regulatory agencies is essential to this program's success. DoD is working closely with EPA nationwide to agree on the best strategy and plan to address the UXO issue and develop a unified regulatory framework for both active and BRAC installations, as well as FUDS properties.

* * * * *

Even as we confidently present our progress toward site closeout in a maturing environmental restoration program, significant challenges are unfolding on the horizon. Increasing awareness of the thorny issues UXO cleanup poses reminds us that we are still learning about the environmental ramifications of past practices. Funding to complete current activities and meet future needs will remain a concern. As these issues evolve, DoD will continue to take responsibility for remedying past actions and practicing sound future planning.

DoD intends to demonstrate this resolve in its relationships with stakeholders and through its programmatic activities, such as—

- Continuing to seek innovative technologies
- Building voluntary cleanup agreements tailored to states' needs
- Enhancing working relationships with EPA and other government entities.

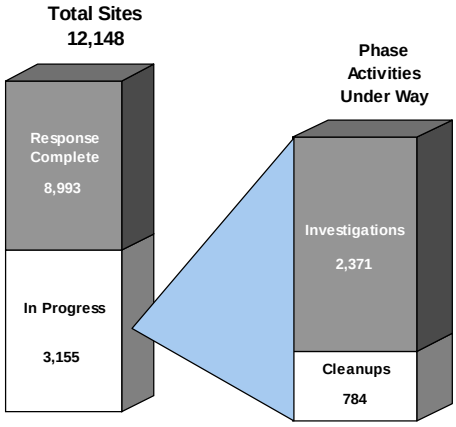
ARMY

Cleanup Status and Progress

"The Army is moving ahead with restoration, and gaining efficiencies as we progress. Our commitment is to partner with stakeholders, develop new ideas for improving the sequencing of site cleanups, and use independent technical reviews to make the program more focused and more effective."

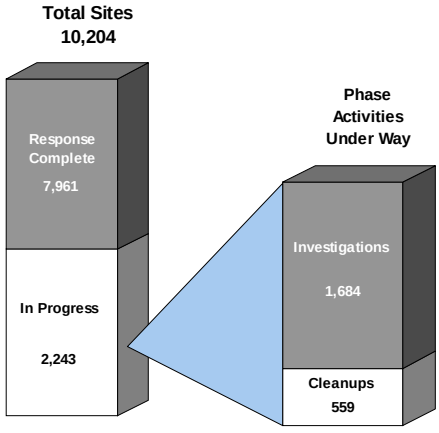
— RAYMOND J. FATZ, DEPUTY ASSISTANT SECRETARY OF THE ARMY

Active and BRAC Site Status as of September 30, 1998

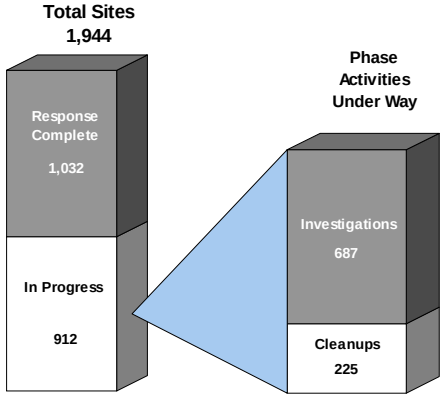


In fiscal year 1998 (FY98), the Army completed its transition from centralized to decentralized execution of the Army cleanup program at operating installations. Under the new decentralized regime, Army Major Commands have responsibility for all program planning, budgeting, and execution. Specific responsibilities include establishing program and project priorities, sequencing project execution, and allocating funding among installations and sites. Before decentralization, the Army Headquarters and the Army Environmental Center centrally managed these

Active Site Status as of September 30, 1998

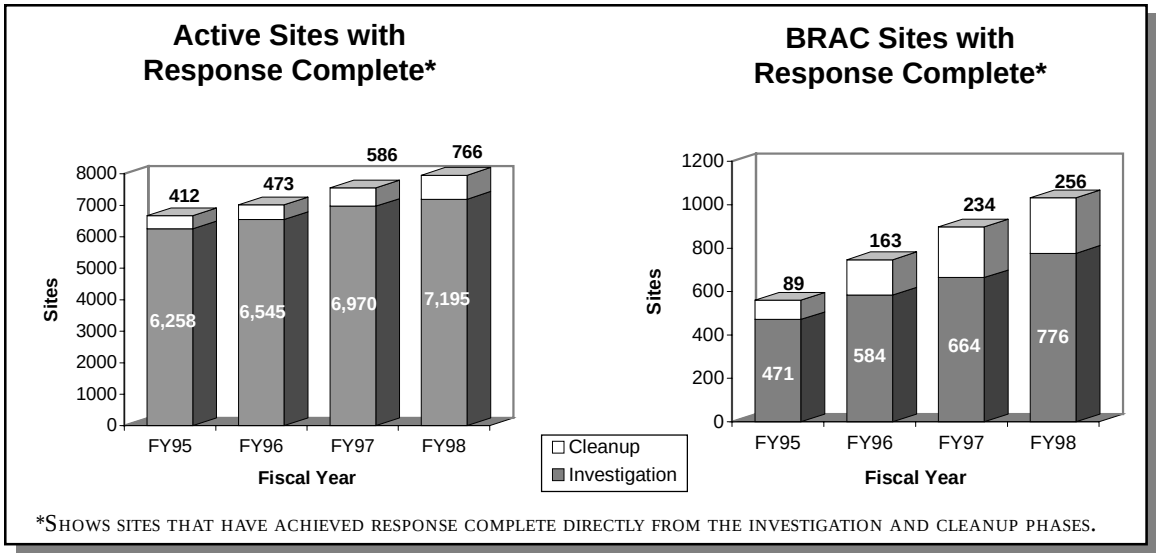


BRAC Site Status as of September 30, 1998

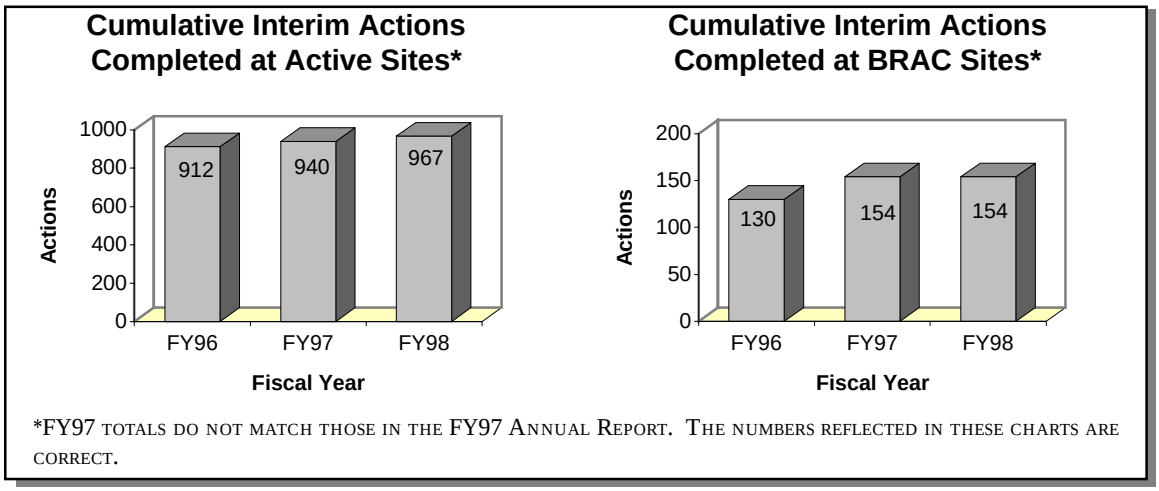


functions. The full advantages of the FY97 separation of the central Defense Environmental Restoration Account (DERA) into Service-led accounts, including the Army Environmental Restoration (ER) account, and decentralized execution also have allowed Army program managers to identify and shift management focus to initiatives that will produce long-term benefits. These initiatives, which are described below, will continue to ensure protection of human health and the environment and compliance with statutory requirements and agreements, while emphasizing cost-effectiveness and completion of site cleanup.

To date, the Army has identified 10,204 potentially contaminated sites at 1,076 active installations. Of these sites, 7,961 require no further action, except long-term monitoring. Restoration activities are planned or under way at 2,243 sites. The Army has completed final remedy construction at 844 sites, 66 of which require Remedial Action Operations. In addition, through FY98 the Army completed 967 interim actions at 629 active installation sites. In FY98, 405 sites that were undergoing studies or cleanup were determined to be completed and to require no further action. Eight installations, excluding U.S. Army Reserve Centers, achieved remedy in place or response complete status at all sites.



*SHOWS SITES THAT HAVE ACHIEVED RESPONSE COMPLETE DIRECTLY FROM THE INVESTIGATION AND CLEANUP PHASES.



*FY97 TOTALS DO NOT MATCH THOSE IN THE FY97 ANNUAL REPORT. THE NUMBERS REFLECTED IN THESE CHARTS ARE CORRECT.

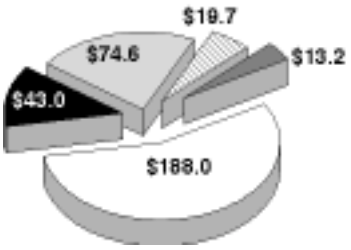
Restoration activities are in progress at most of the 112 installations that are being closed, and at the 27 installations that are being realigned, under the Base Realignment and Closure (BRAC) 1988, 1991, 1993, and 1995 rounds. To date, the Army has identified 1,944 potentially contaminated sites at 117 BRAC installations. Of these sites, 1,032 require no further action except long-term monitoring. Restoration activities are planned or under way at 912 sites. The Army has completed final remedy construction at 278 sites, 12 of which require Remedial Action Operations. In FY98, studies and cleanups were completed at 134 BRAC sites, and these sites require no further action. Thirty-nine BRAC cleanup teams have been formed to support fast-track cleanup at installations where there is excess property. At all other BRAC locations, the Army has appointed a point of contact for fast-track cleanup. In FY98, the Army completed all Environmental Baseline Surveys for installations affected by the 1995 BRAC round.

Goals and Priorities

The Army continues to refine its cost estimates for completing cleanup of its hazardous waste sites. Each year the cost to complete cleanup of all hazardous waste sites has declined by more than the amount spent on cleanup. Examination of cleanup assumptions and validation of data from ongoing cleanup sites now reveal a total projected cost-to-complete of $7.9 billion: $6.5 billion for installation restoration (IR) at active bases and $1.4 billion for IR at BRAC installations. This total is $1.2 billion less than last year's cost-to-complete estimate.

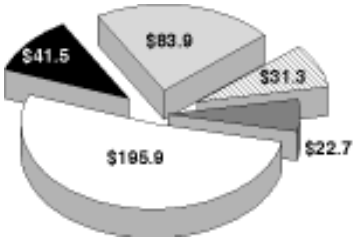
Army Environmental Restoration Funding Profile
(in millions of dollars)

FY97 ER, Army Funds Executed



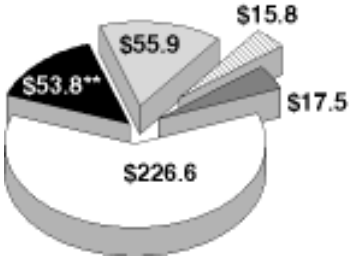
Total = $338.5 million

FY98 ER, Army Funds Obligated



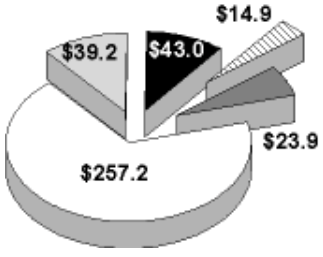
Total = $375.3 million

FY99 ER, Army Execution Planned



Total = $369.6 million

FY00 ER, Army Planning Estimates



Total = $378.2 million

**FY99 planned management includes approximately $11 million withheld for potential projects, primarily at Massachusetts Military Reservation.

Note: For BRAC funding information, see Figure 22 on page 34.

In the BRAC environmental restoration program, the Army is focusing on making property environmentally suitable for transfer. In addition to addressing imminent threats to human health and the environment, the BRAC program emphasizes property reuse potential in establishing cleanup priorities.

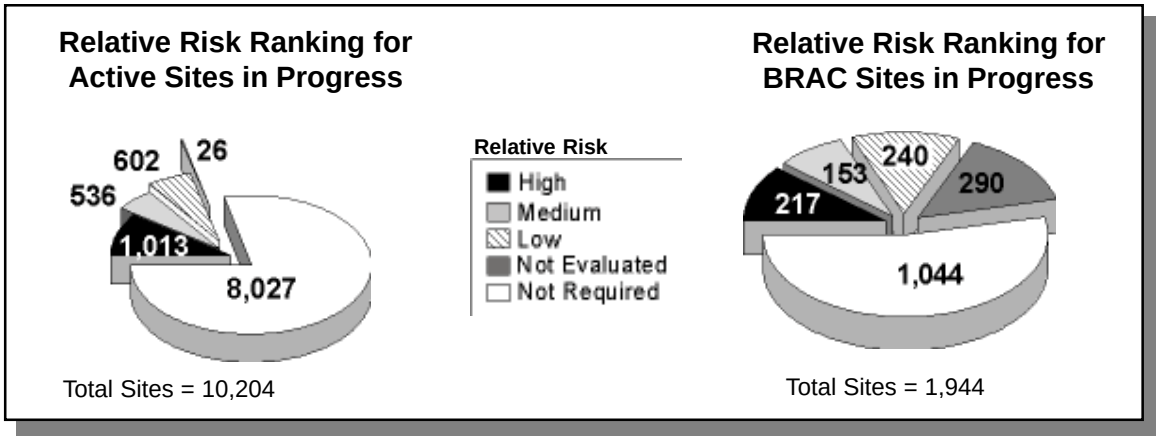
The Army also continues its work on developing a DoD Range Rule covering response actions for unexploded ordnance and other constituents of munitions at ranges that have been closed or transferred or are undergoing transfer. The Range Rule must ensure that the Department of Defense (DoD) is responsive and responsible and must include a process for conducting range responses that fall within DoD's authority.

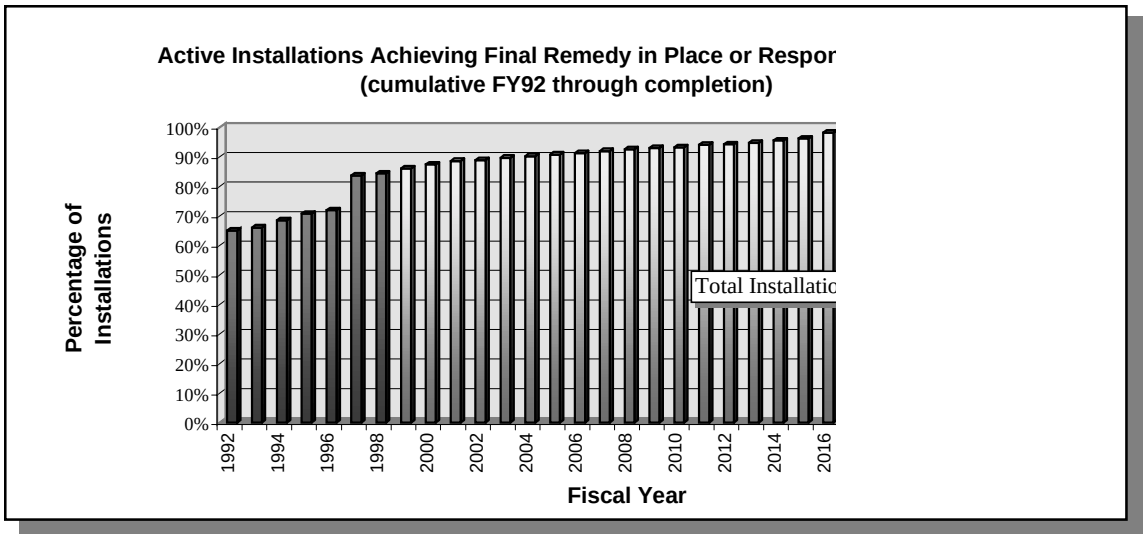
The initial impetus for the Range Rule occurred in 1992. In that year, the Federal Facility Compliance Act of 1992 amended the Resource Conservation and Recovery Act (RCRA), requiring the U.S. Environmental Protection Agency (EPA), in consultation with DoD, to promulgate regulations identifying when conventional and chemical military munitions become hazardous waste subject to RCRA Subtitle C regulations. In the same year, the Office of the Secretary of Defense directed the Army to develop the DoD Range Rule. The rule will specify procedures to ensure safety and protect human health and the environment and should result in cost-effective responses.

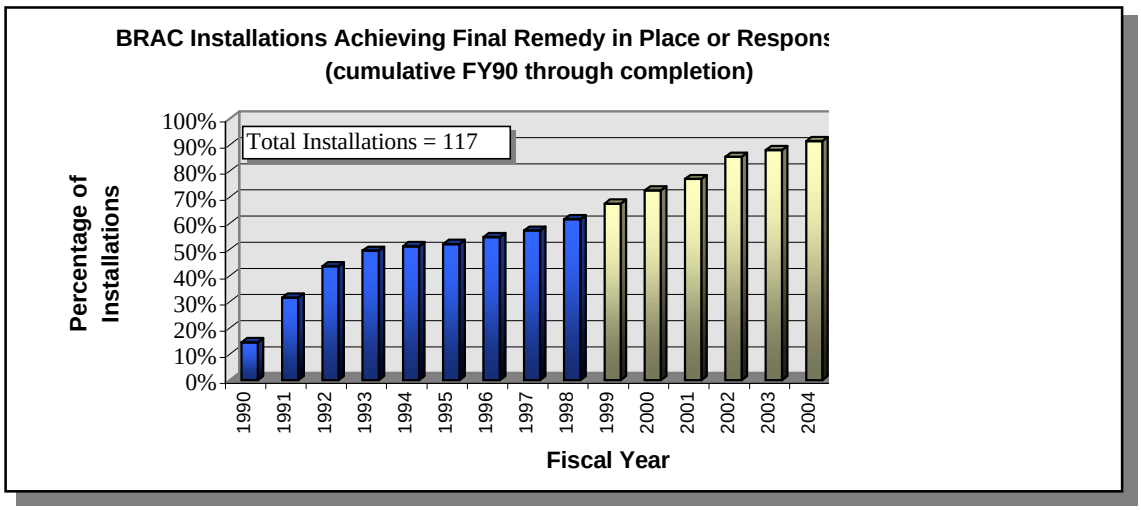
During FY98 the Army received and summarized approximately 250 pages of public comments on the proposed Range Rule that was published in the *Federal Register* (62 FR 50795) on September 26, 1997. Preparation of responses to these comments is ongoing. DoD expects to revise the Range Rule in response to the comments and to finalize the rule by summer 2000.

Program Accomplishments

In FY98, the Army reduced the number of active installation sites that had not been evaluated for relative risk from 143 to 26. Similar progress was made in the BRAC program, with unevaluated sites decreasing from 695 to 290. These evaluations are essential to cleanup efforts at installations because they are used as a tool in sequencing cleanup efforts. While not exclusively an Army achievement, the Pennsylvania multisite agreement achieved by DoD, the military components, and the







Commonwealth of Pennsylvania will significantly benefit the Army's extensive cleanup efforts in the state. This pact is the first cooperative multisite cleanup agreement between DoD and a state.

Installation Achievements

At individual installations the Army reaped the benefit of strong partnerships with regulators and the public. Army reassessment of existing and planned groundwater treatment systems was also beneficial.

At Twin Cities Army Ammunition Plant (TCAAP) in New Brighton, Minnesota, several years of effort culminated in the signing of the installationwide Record of Decision (ROD), the last remedy decision for the installation. The Army also recovered $3.9 million from the insurance company for this government-owned, contractor-operated facility. These funds are now available to the Army's cleanup program for future cost recovery efforts.

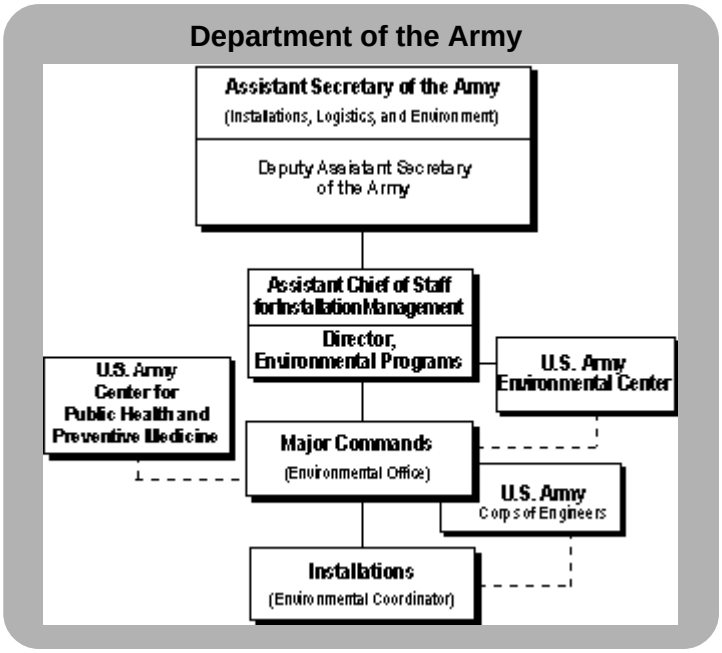
At Hunter Army Airfield in Georgia, the Army will recommend implementation of a monitored natural attenuation remedy instead of a costly pump-and-treat system, as part of an initiative to reassess planned groundwater treatment systems. If accepted by the environmental regulators and the local community, this recommendation could result in savings of $5 million. A separate study of existing and proposed groundwater remediation systems at Riverbank Army Ammunition Plant in California resulted in a 40 percent reduction in operating costs and annual savings of $1.2 million dollars.

Also in FY98, Schofield Barracks in Hawaii achieved the milestone of attaining "Construction Complete" status at all remediation projects. The Army has formally petitioned EPA to delete the Schofield Barracks from the National Priorities List (NPL). NPL deletion is anticipated by the end of FY99.

At Fort Dix, the Army worked closely with EPA Region 2 and state regulators to obtain agreement on designating the NPL-listed landfill Construction Complete. The Army will pursue NPL deletion of this installation with EPA in FY99.

Management Initiatives and Improvements

In FY98, the Army expanded on its independent technical review (ITR) program, which was piloted at four BRAC installations in FY97. The ITR program involves a 1- to 2-week review of the technical, administrative, and managerial aspects of an installation's cleanup program by a panel of Army and non-Army experts. Advice emerging from the reviews ranges from specific remedies for individual cleanup sites to ideas on how to negotiate with regulators and the public on controversial issues. Findings and recommendations are not final until acceptance by the regulatory agencies and receipt of input from the local community. In FY98, the Army conducted reviews at 10 more BRAC installations and piloted the ITR program at 2 active installations. The 14 BRAC installations reviewed through the program were together responsible for a $39 million reduction in BRAC FY99 and FY00 work plan requirements. This cost-avoidance represents a 30 to 1 return on investment for the ITRs. The Army plans to conduct independent technical reviews at 12 BRAC installations and 8 active installations in FY99.



Cleanup Program in Action:
Army Independent Technical Review

The Army's Independent Technical Review is a third-party, project-level technical review program that provides recommendations for investigations and cleanup plans. The ITR process gives remedial project managers (RPMs) and installation leadership access to some of the nation's most respected environmental experts in a variety of environmental disciplines. The panel reviews specific projects to determine whether the investigative approach and the proposed actions are technically sound. It then supplies the RPMs' leadership with technical recommendations on the appropriate course(s) of action. The panel's recommendations are intended to improve decision making and to support technically sound initiatives. In addition to making recommendations, the ITR subject matter experts provide technical assistance to address specific issues identified during the reviews.

The overall objective of the ITR is to ensure the implementation of cost-effective investigations and remedies, while meeting the Army's obligation to protect human health and the environment. The ITR may validate planned actions on the basis of technical merit or recommend alternatives that are more effective or less costly. The recommendations help the installation determine the appropriate course of action and present a credible case for those decisions to regulators and the public. Findings and recommendations are not final until acceptance by the regulatory agencies and receipt of input from the local community.

The Army expanded the ITR program that was piloted at four BRAC installations in FY97. The Army conducted the reviews at 10 more BRAC installations and piloted the reviews at 2 active installations.

The Army also initiated an effort to optimize use of resources dedicated to operating and maintaining groundwater treatment systems. The Army currently operates major groundwater pump-and-treat systems at 35 installations, with annual system operating costs totaling approximately $25 million. The average construction cost for each of these major systems is approximately $3 million, and the systems have a design life of at least 30 years. Of the systems that have a definable treatment objective, more than 50 percent were designed to contain plumes rather than to restore aquifers. In FY98, the Army began reassessing the effectiveness of the most expensive of its groundwater treatment systems. The goal of this initiative was to identify where system improvements, closure, or substitution of alternative technologies might be warranted. Any modifications would have to establish or meet treatment objectives, protect human health and the environment, reduce long-term operations and maintenance requirements, and maximize the cost-effectiveness of the remedy. In some cases, it was believed that existing treatment systems might be ineffective or marginally effective. Such systems could be replaced with less costly in situ systems or supplemented through proven natural attenuation processes. The Army has also begun to reassess plans for almost 70 additional pump-and-treat systems.

Information and Technology Transfer

In FY98, the Army greatly improved the quality and consistency of the data required for managing and reporting on restoration activities at its installations. Historically, ensuring that Army installations, major commands, and headquarters all have, and are reporting, the same data has been a challenge. To address this problem, the Army moved its data collection to a Web-based system. Installations can now access the database directly from their workstations, updating data elements as necessary. Management at the major commands and headquarters can access the data and perform quality control and queries. The Army also integrated the BRAC Cleanup Plan Abstracts into this system, so that planning and data collection for active and BRAC installations both reside on the same system. Previously, substantial quality control efforts and expenditure of resources were needed to ensure that the data contained in the abstracts were consistent with the information in the database and vice versa. This problem has been virtually eliminated with the new Web-based system. The current DERP Annual Report to Congress represents the debut data collection effort with this system. The results were encouraging: data accuracy was much better than expected, especially since installations were just learning the new methodology.

During the past year, the Army also has been actively supporting the initiatives of the Federal Remediation Technologies Roundtable (FRTR). The FRTR is sponsored by EPA's Technology Innovation Office and is a cooperative effort of federal agencies with environmental restoration requirements. In FY98, the Army Environmental Center took the lead in making the FRTR-developed Restoration Technologies Screening Matrix and Guide available on the World Wide Web. Formerly available only in hard copy, this reference is now available to federal agency remediation project managers, contractors, and academics over the Internet. The reference provides guidance on identifying and selecting appropriate available technologies for cleaning up all types of contamination. The Army Corps of Engineers Center of Expertise for Hazardous and Toxic Waste developed the home page, as well as links for the FRTR Web site.

Outreach

In FY98, the Army held outreach meetings in five of the EPA regions. These forums bring together Army major command and headquarters managers and the region's EPA and state regulators. The meetings cover such topics as program goals, budgeting, community involvement, partnering, innovative technologies, case studies, and regulatory issues. The Army hopes to have outreach meetings in the other five EPA regions in FY99.

Partnerships with regulators and the community in FY98 produced substantial benefits for the Army's program. At Fort Wainwright in Alaska, for example, excellent teaming relationships with regulators and coordination on the revision of the final operable unit's ROD resulted in an expedited review of this document. The ROD is now in the final draft stages. At the Tobyhanna Army Depot in Pennsylvania, successful partnering with EPA and state regulators resulted in one closeout document for 35 No Further Action sites instead of two RODs as originally planned, saving both time and money. Partnering initiatives at Redstone Arsenal in Alabama with EPA Region 4 and the

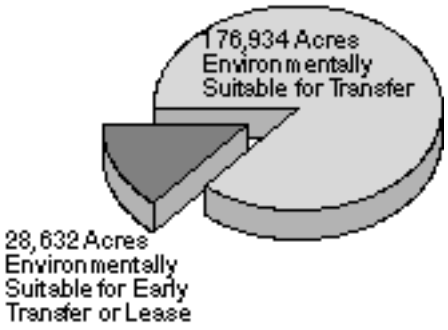
Alabama Department of Environmental Management improved document review time and resulted in more effective, faster decision making.

The Army continues to demonstrate good faith and commitment to working with local communities, sharing cleanup program information as it is learned and receiving input regarding project priority, sequence of project implementation, and funding allocation. The Army has learned that Restoration Advisory Boards (RABs) can be an effective tool for obtaining this community insight and advice. By the end of FY98, the Army had established 64 RABs, and five RABs were established during the fiscal year. The Army continues to evaluate community interest in establishing RABs at additional installations to ensure that it can fully benefit from community involvement in its cleanup program.

BRAC Highlights

At BRAC installations, the Army continues to work with local communities and local reuse authorities to accomplish transfer of property. In FY98, the Army initiated the NPL deletion of a 37-acre parcel at the Army Research Laboratory in Watertown, Massachusetts. This action will greatly enhance the value of the property transferred. The local reuse authority has agreed to maintain the land use controls that were implemented as part of the remedy at the installation. Use of land use controls also enabled the Army to transfer a parcel with groundwater contamination at Letterkenny Army Depot, Pennsylvania. Use of such controls has been a matter of concern to local communities, because of the need to ensure that the controls will be maintained when the Army no longer occupies the BRAC installation. To allay such concerns, the Army issued an interim policy addressing how land use controls will be documented and maintained after transfer of property. This policy establishes a benchmark for all DoD activities, since DoD intends to provide guidance to all military components on this issue.

Environmental Condition of BRAC Property



In an additional milestone for the Army BRAC program, the Army negotiated its first use of the CERCLA §120(h)(3)(C) early transfer authority. The actual early transfer of a 1,621-acre parcel at Tooele Army Depot in Utah occurred in December 1998. The BRAC program continues to stress expediting environmental responses to meet property transfer goals and is using removal authority to a greater extent in order to achieve these goals.

The BRAC ITR program produced savings at several installations, most prominently at Savanna Army Depot in Illinois, where the ITR recommended no further action, based on minimal risk, at an old burning ground on a small island in the Mississippi River. A removal action with a life-cycle cost of approximately $68 million dollars (and FY99 and FY00 costs of approximately $25 million) had been planned at the site. Based on the minimal evidence of unacceptable risk to human health or the environment, the ITR determined this action to be unnecessary.

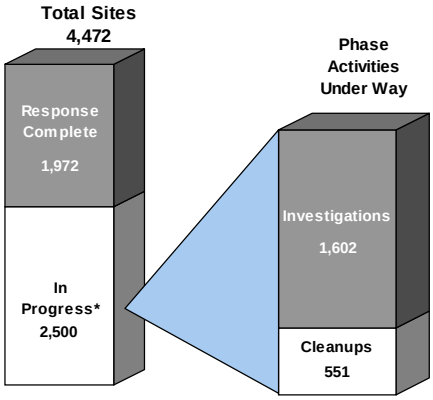
NAVY

Cleanup Status and Progress

"Open and cooperative decision-making with regulators and communities is an important tool for success in our environmental programs. Successful partnering efforts make better use of cleanup money by promoting communication and teamwork among diverse interests, reducing the time between study and actual cleanup of contamination, and sustaining performance of the overall cleanup effort."

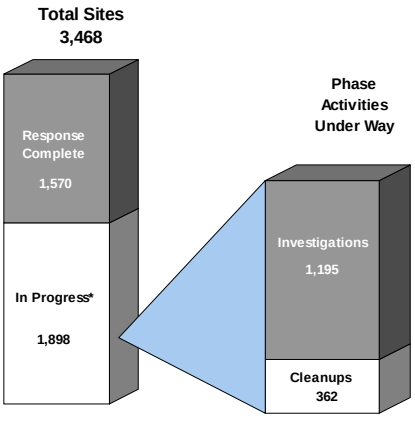
— Robert B. Pirie, Jr., Assistant Secretary of the Navy (Installations and Environment)

Active and BRAC Site Status as of September 30, 1998

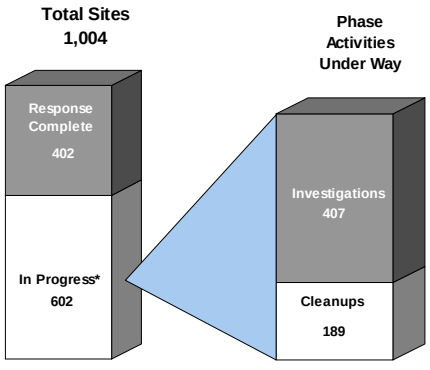


The Department of the Navy (DON) continues to make substantial progress toward completion of its Environmental Restoration Program in the face of unusual and complex challenges. Some of those challenges are directly associated with the DON mission and related operational factors. Most Navy and Marine Corps installations are located in coastal areas, which generally have environmentally sensitive habitats and populous surrounding communities. The heavily industrialized operations that typically exist at naval installations to support ships and aircraft

Active Site Status as of September 30, 1998



BRAC Site Status as of September 30, 1998**



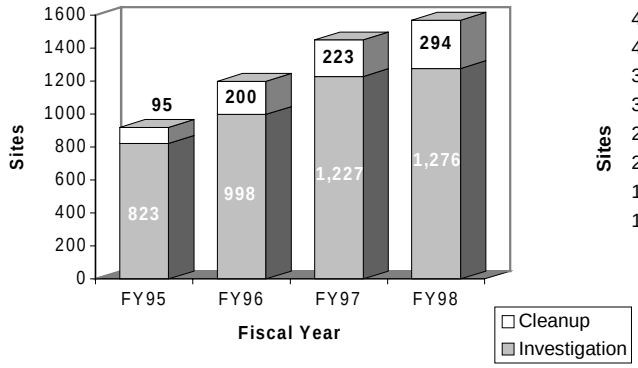
*NOTE: IN-PROGRESS INCLUDES SITES WHERE ACTIVITIES WILL BE UNDER WAY IN THE FUTURE. THEREFORE, TOTALS OF SITES WITH PHASE ACTIVITIES UNDER WAY ARE GENERALLY LESS THAN THE TOTAL NUMBER OF SITES IN PROGRESS.

**PROGRESS FROM FY97 TO FY98 WAS AFFECTED BY REGULATORS' REOPENING OF NUMEROUS SITES THAT WERE CONSIDERED RESPONSE COMPLETE BY THE NAVY.

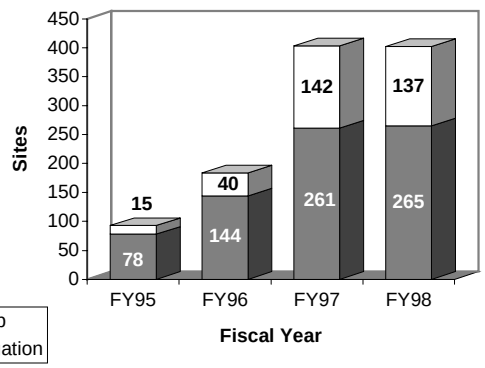
add to the complexity of cleanup. Installations slated for closure or realignment also have a significant impact on the program, particularly in the areas of land reuse and fast-track cleanup.

To date, DON has identified 4,472 potentially contaminated sites at 241 installations. Of these sites, 1,972 require no further action. Restoration activities are planned or under way at 2,500 sites. The Navy has completed final Remedial Actions at 544 sites. Of these sites, 134 require Remedial Action Operations. Interim Actions have been completed at 881 sites. In FY98, the Navy completed 189 Interim Actions at active sites, bringing the total number of completed Interim Actions at active sites to 849 at 614 sites. By the end of fiscal year 1998 (FY98), 1,570 of the 3,468 potentially contaminated active sites at Navy and Marine Corps installations had been brought to Response Complete status through cleanup actions or verification that no cleanup action was required. During FY98, 95 active sites were brought to Response Complete status through cleanup activities; 54 active sites were determined to be Response Complete or to require no further action based on appropriate investigation and analysis. Analysis or cleanup actions are in progress at the 1,898 remaining sites. Thirty-nine percent, or 748, of these sites are categorized as high relative risk. Cleanup at Navy's active installation sites is now funded by the Navy's Environmental Restoration Account (ER, Navy).

Active Sites with Response Complete*



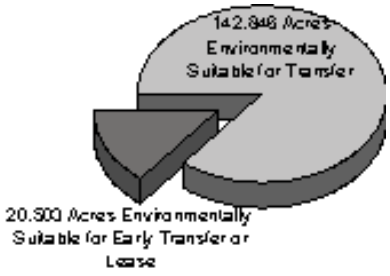
BRAC Sites with Response Complete*†



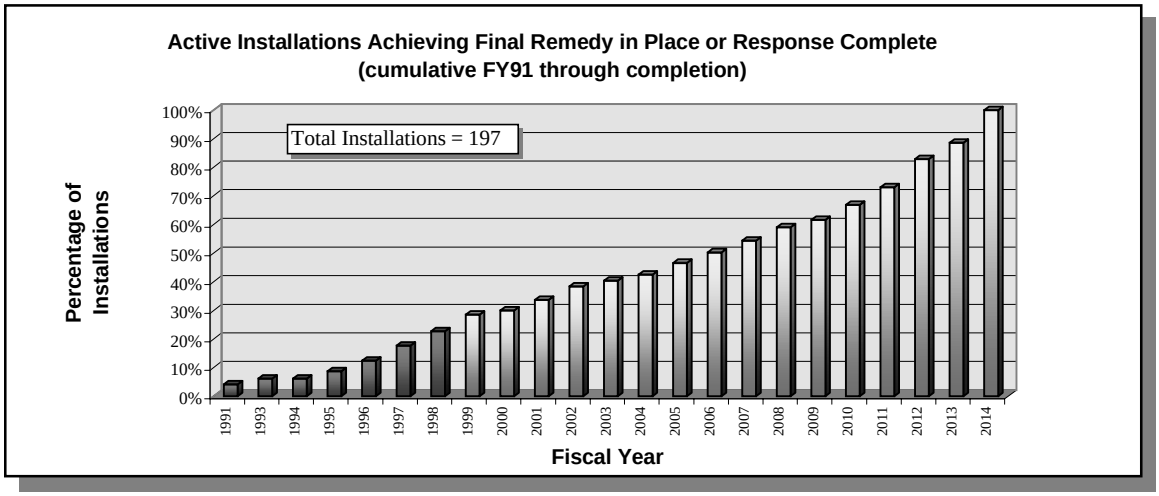
*SHOWS SITES THAT HAVE ACHIEVED RESPONSE COMPLETE DIRECTLY FROM THE INVESTIGATION AND CLEANUP PHASES
†CLEANUP AND INVESTIGATION CATEGORIES CHANGED FROM FY97 TO FY98 BECAUSE REGULATORS REOPENED NUMEROUS SITES.

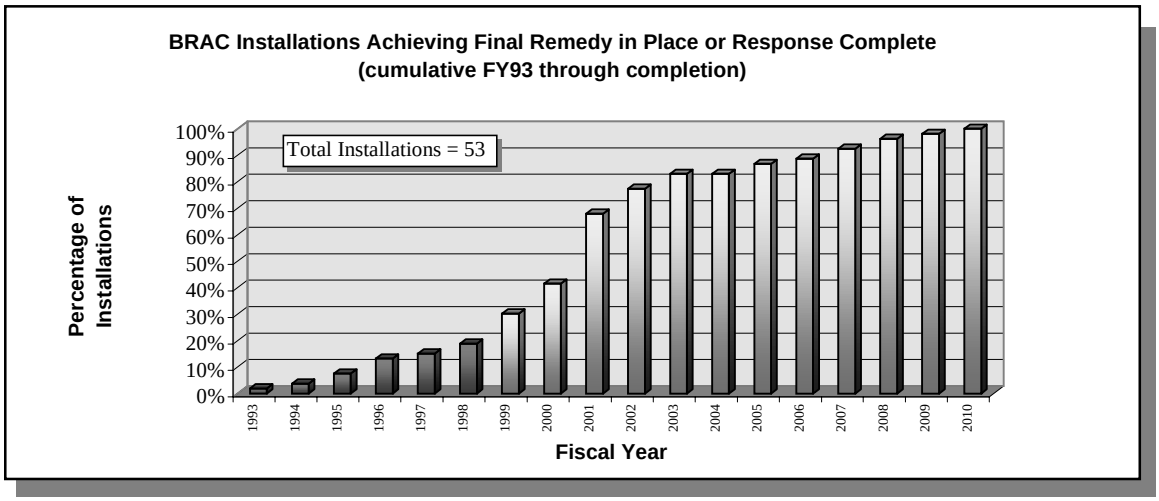
The Base Realignment and Closure (BRAC) 1988, 1991, 1993, and 1995 lists include 53 Navy and Marine Corps installations. Navy installations have formed 41 BRAC cleanup teams to support cleanup. Local Redevelopment Authorities have completed reuse plans at 42 Navy BRAC installations. Reuse plans have been initiated at six additional installations. Environmental Baseline Surveys, as well as BRAC Cleanup Plans, have been completed for all BRAC fast-track installations. Approximately 163,349 acres are in excess to the Navy. Excess property is

Environmental Condition of BRAC Property



available at 43 installations. At the end of FY98, 88 percent of the property at the Navy's BRAC fast-track sites had been determined to be environmentally suitable for transfer. Of the 1,004 Navy BRAC sites, 402 are Response Complete. Investigations or cleanup actions are in progress at the 602 remaining sites. During FY98, 41 BRAC sites were brought to Response Complete status through cleanup activities, and 41 BRAC sites were determined to be Response Complete or to require no further action based on appropriate investigation and analysis. Also in FY98, the Navy completed 120 Interim Actions at BRAC sites, bringing the total number of Interim Actions completed at BRAC sites to 372 at 267 sites.





Goals and Priorities

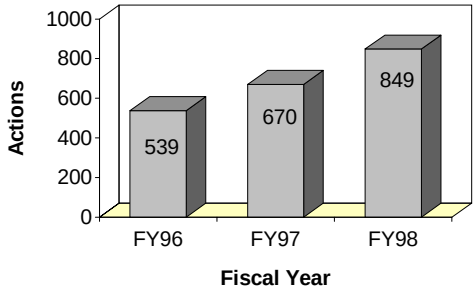
DON's program goals and priorities are based principally on a risk management or risk-plus approach, which considers the risk assigned to sites through DoD's Relative Risk Site Evaluation framework along with other risk management factors, such as reuse (for BRAC properties), legal requirements, economic considerations, and stakeholder concerns. For completion of its Environmental Restoration Program, DON endorses a

stable-funding approach that is consistent with achieving the restoration goals outlined in the Defense Planning Guidance. At active and closing installations, the cost to complete the Environmental Restoration Program for the Navy and the Marine Corps is now estimated at approximately $4.22 billion (this estimate does not include program management costs). This amount, plus the $1.3 billion spent from FY96 to FY98, is $2.1 billion less than the $7.63 billion anticipated cost-to-complete projected at the beginning of FY96.

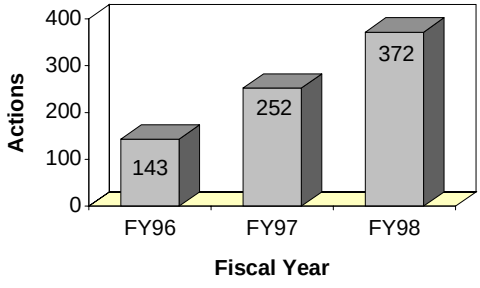
DON's goal is to spend at least 70 percent of its total program budget, or about 80 percent of the amount directly chargeable to project work, on high-relative-risk sites. This goal puts the proper emphasis on relative-risk reduction while allowing appropriate flexibility for addressing stakeholder concerns and other risk management considerations. Other elements informing the Navy's risk management philosophy are the need to expedite cleanup of BRAC property slated for reuse and the need to plan for, and take advantage of, projects that provide economies of scale. Economies of scale are achieved by addressing similar, proximate sites in a coordinated way as part of the same project, instead of initially addressing only high-risk sites and then addressing related low-risk or medium-risk sites individually. In such cases, flexible management allows medium- and even low-relative-risk sites to be included in the project along with the high-relative-risk site(s) that are given top budgetary priority. DON also has an initiative under way to accelerate the cleanup or closure of all sites at installations that have only a few, generally less complex, sites. This initiative is geared toward closing out the restoration program at these installations. By doing this, DON will avoid costs by eliminating the continued overhead associated with maintaining a program at the installations.

DON continues to emphasize accomplishing cleanups, while maintaining the necessary level of investment in site analysis. The DON goal is to spend at least 60 percent of its total program budget on actual cleanup. This goal was exceeded in FY98, when 61 percent of the total program funding was spent on cleanup. Continued use of Interim Remedial Actions and Removal Actions is helping DON achieve these aggressive cleanup goals.

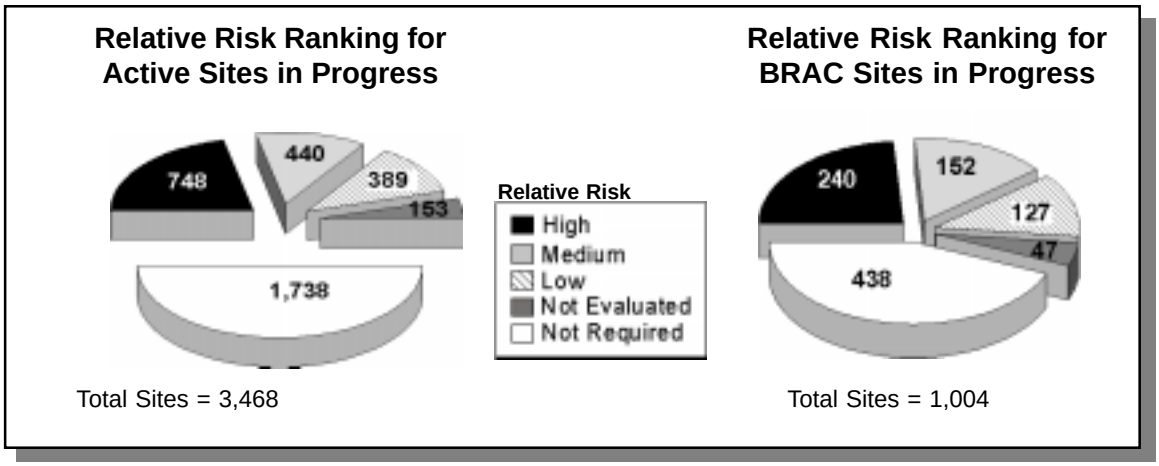
Cumulative Interim Actions Completed at Active Sites



Cumulative Interim Actions Completed at BRAC Sites*



*BRAC FY96 AND FY97 TOTALS HAVE BEEN UPDATED SINCE THE PREVIOUS ANNUAL REPORT TO REFLECT NEW AND REVISED NAVY DATA AS OF FY98.



Relative Risk Evaluation

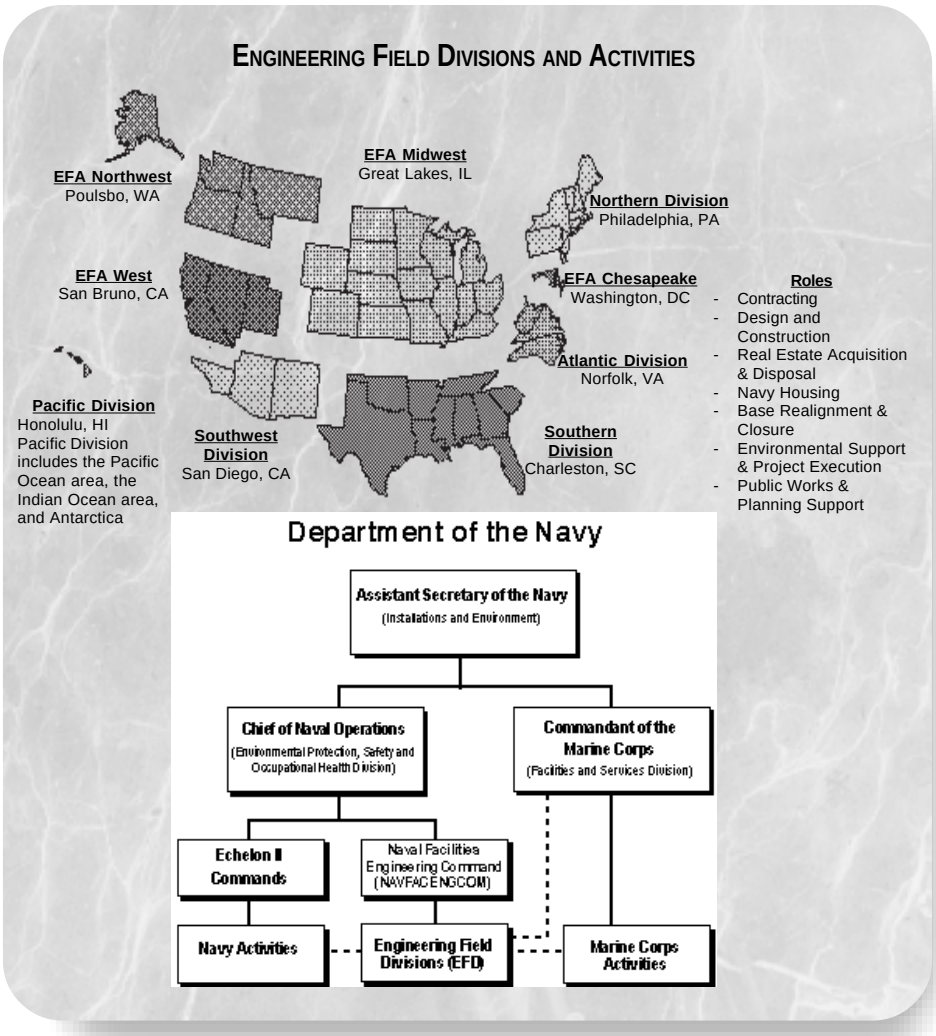
During FY98, DON reduced the number of sites that had not been evaluated for relative risk from 231 to 200. The remaining unevaluated sites are new sites that will be evaluated in FY99 or existing sites that do not require evaluation or cannot be evaluated because of technical considerations in the DoD Relative Risk Site Evaluation model.

Organization

DON executes its Environmental Restoration Program through the Naval Facilities Engineering Command (NAVFAC) and its eight Engineering Field Divisions and Activities (EFD / As) nationwide. Remedial project managers (RPMs) are assigned for each installation in each geographic region covered by an EFD / A. The RPMs reside at the EFD / As but work closely with the installations and the regulators in planning, setting priorities, establishing budgets, and coordinating project execution. Contracting, technical coordination, direction, and execution of the work are centrally managed by the RPMs and the support staff at the EFD / As. Installations generally take the lead in community relations, outreach, and public involvement and maintain ultimate responsibility for their respective restoration programs.

The regionally centralized approach offered by the EFD / As provides DON with a number of benefits, including consistency, the ability to take advantage of efficiency, and economies of scale. Some of these benefits can be seen in the very successful partnering efforts among EFD / As, the U.S. Environmental Protection Agency (EPA) regions, and the states. The regional approach allows partnering efforts to be especially well coordinated and efficient and helps maintain program continuity over time.

Other benefits of the regional approach are consistency in policies and guidance, management and technical approaches, and planning and priority-setting within a given EPA region; enhanced communication and sharing of information and lessons learned among RPMs; and efficiencies and economies of scale in contracting and other resource-support activities.



Management Initiatives and Improvements

The Navy continues to use the NORM data management and information system. This system, which is based on a design that normalizes the various data collected and reported for the Environmental Restoration Program, has consolidated and improved system requirements and capabilities that previously were contained in multiple stand-alone databases. NORM eliminates the duplication of effort that was inherent in the previous systems, providing an integrated data management and collection process that not only serves reporting requirements but also provides an accessible, useful tool for field personnel. NORM was used to develop the FY99 and FY00 DON budgets and has improved the quality and timeliness of data, increasing DON's ability to plan and to allocate resources.

In addition, the Navy continues to rely on the DON 5-Year Environmental Restoration Plan as an important planning, communication, and management tool. Published annually, the 5-year plan helps DON communicate its successes to installation personnel, regulatory agencies, and the public.

WorldWideWeb
The Department of the Navy (DON) 5-Year Plan
http://5yrplan.nfesc.navy.mil/

Information and Technology Transfer

The area of information and technology transfer remains one of DON's strengths. The Naval Facilities Engineering Command directly coordinates the various installation restoration technology transfer efforts within its command and field offices, with technical support provided by the Naval Facilities Engineering Service Center (NFESC). The key groups in DON's technology transfer effort are NFESC, the Navy Environmental Leadership Program (NELP), and the Alternative Restoration Technology Team (ARTT).

WorldWideWeb
Navy Environmental Leadership Program (NELP)
http://nelp.navy.mil

NFESC provides DON with specialized engineering, scientific, and technical products and services and is oriented toward the transfer of technology through consultation and technical assistance, patent license agreements, cooperative research and development agreements, and direct rapid response to requests for support. It continues to be the hub of the Navy's innovative environmental remedial technology demonstrations, evaluations, and technology information transfer efforts. Three important NFESC-led activities are the Cleanup Review Tiger Team, solicitation and use of private-sector technology input, and technical seminars at the EFD / As.

WorldWideWeb
Naval Facilities Engineering Service Center (NFESC)
http://www.nfesc.navy.mil/

Since FY96, NFESC has led technology application peer reviews, known as the Cleanup Review Tiger Teams, at each EFD / A. This review effort includes discussions with 150 RPMs who are responsible for approximately 460 sites. The reviews focus on high-cost projects, where use of innovative technologies and approaches is most likely to produce quality improvements. The teams make site-specific findings and recommendations, as well as general recommendations for improving the quality and performance of the DON

Environmental Restoration Program. Tiger Team reviews were conducted in FY97 and FY98. The findings and recommendations of the Tiger Team effort have improved program execution, reduced remediation costs at numerous sites, and accelerated environmental cleanup efforts. Future efforts of the Tiger Team will focus on complex anticipated issues such as ecological risk assessment and cost-effective site closeout.

Since FY97, NFESC also has promoted the use of private-sector innovative technological advances within the Navy, with the semiannual issuance of a Broad Agency Announcement (BAA) in the *Commerce Business Daily*. This program encourages vendors, especially smaller companies and innovators, to submit abstracts on their innovative environmental technologies to the Navy for potential demonstration throughout the EFD / As. Technologies submitted for review are evaluated, and those that match the needs of specific sites proceed to the demonstration phase. Currently, 3 demonstration projects are complete and 14 projects are in progress. The BAA program has been very useful and will continue into the foreseeable future.

The NFESC also conducts annual technical seminars at the Engineering Field Divisions and Engineering Field Activities, presenting the latest remedial technologies and tools. Remediation Innovative Technologies Seminars (RITS) in FY97 and FY98 focused on low-temperature thermal treatment, small-arms ranges, alternative methods of landfill capping, permeable reactive walls, surfactant-enhanced aquifer remediation, phytoremediation, constructed wetlands, and air sparging. These seminars have been instrumental in providing RPMs with technical information on innovative technologies and giving them the latest tools for implementing these technologies at their sites.

Another important contribution to DON's technology transfer initiatives is the Naval Environmental Leadership Program, located at Naval Station Mayport, Florida, and Naval Air Station (NAS) North Island, California. NELP is instrumental in developing and demonstrating cost-effective, innovative environmental technologies that can be transferred to, and adopted at, other DoD installations.

Where NELP concentrates on developing and demonstrating new technologies, the ARTT, which consists of various technical managers and representatives and organizations throughout the DON chain-of-command, focuses on their application. The ARTT's mission is to promote the use of innovative technologies for effectively closing out sites while protecting human health and the environment. The team is responsible for the following activities:

- Identifying barriers to implementing innovative technologies
- Recommending process changes that will eliminate or minimize the impact of barriers to implementing technologies
- Proposing policies and procedures for developing and implementing new technologies
- Developing and recommending initiatives and strategies that support use of innovative technologies
- Identifying potential sites and innovative technologies for demonstrations.

In FY98, the ARTT developed a monitored natural attenuation (MNA) protocol in collaboration with the U.S. Geological Survey. This protocol provides NAVFAC RPMs with user-friendly, step-by-step guidance on the use of MNA.

Outreach

Public outreach and stakeholder participation are critical to the success of DON's efforts to responsibly address cleanup issues at Navy and Marine Corps installations. DON's strong support of community outreach is evidenced by its commitment to providing meaningful opportunities for public participation. DON has established Restoration Advisory Boards (RABs) at more than 100 active and closing Navy and Marine Corps installations and seeks other opportunities, such as installation open houses, presentations to service clubs, and sponsorship of environmental education in local schools, to encourage community involvement.

DON continues to lead the way in the Technical Assistance for Public Participation (TAPP) arena. In FY97, it conducted a successful pilot TAPP project at Naval Air Station North Island, California. Once TAPP became official, in February 1998, the Navy initiated DoD's first TAPP assistance contract at NAS Alameda, California. The TAPP application for NAS Alameda was turned around in a matter of days to ensure timely procurement of technical services for the Alameda RAB. This process was a win for both the Navy and the community.

Further illustrating DON's support for stakeholder involvement are DON's groundbreaking negotiations with Native American tribes in the state of Washington on provision of technical assistance on local cleanup issues.

Working with citizens and regulators alike, the Navy will continue to embrace stakeholder advice and contributions in resolving issues and improving the DON cleanup program.

Funding

In FY98, the Navy obligated $275.5 million in Environmental Restoration funds to active installations. Funding levels will decline slightly, to $273.6 million, in FY99. With adjustments for inflation, the FY00 funding level is projected to be $284 million.

In FY98, approximately 61 percent of Navy Environmental Restoration funds was spent on design work, interim or final cleanup actions, and operation and maintenance. By FY00, the proportion of program funds expended for cleanup activities is expected to increase to 64 percent.

In FY98, the Navy obligated $245.5 million in Environmental Restoration funds, not including compliance or planning, to BRAC installations. The planned BRAC funding levels for FY99 and FY00 are $215.3 million and $270.8 million, respectively.

Navy Environmental Restoration Funding Profile (in millions of dollars)

FY97 ER, Navy Funds Executed

Total = $287.1 million

FY98 ER, Navy Funds Obligated

Total = $275.5 million

FY99 ER, Navy Execution Planned

Total = $273.6 million

FY00 ER, Navy Planning Estimate

Total = $284.0 million

NOTE: FOR BRAC FUNDING INFORMATION SEE FIGURE 22 ON PAGE 34.

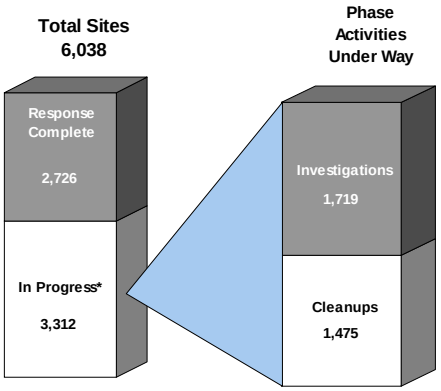
AIR FORCE

Cleanup Status and Progress

"The Air Force continues to prove its commitment to protecting the American people and natural resources through strong environmental programs and sound operating practices while at the same time ensuring we accomplish the Air Force mission. Our core values of 'integrity first, service before self, and excellence in all we do' and Environment, Safety and Occupational Health program principles of 'sustaining readiness, leveraging resources, and being a good neighbor' guide our daily actions. Operating from these combined values and principles allows us to care for Air Force people and American communities while we train to defend our freedom."

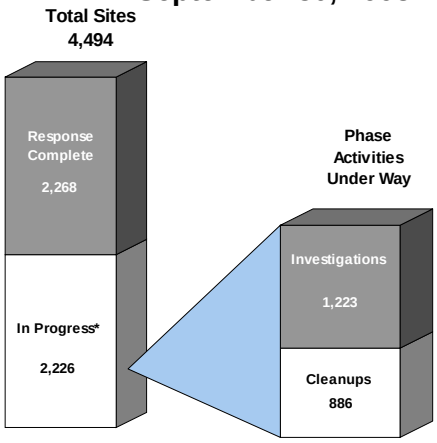
— F. Whitten Peters, Acting Secretary of the Air Force

Active and BRAC Site Status as of September 30, 1998

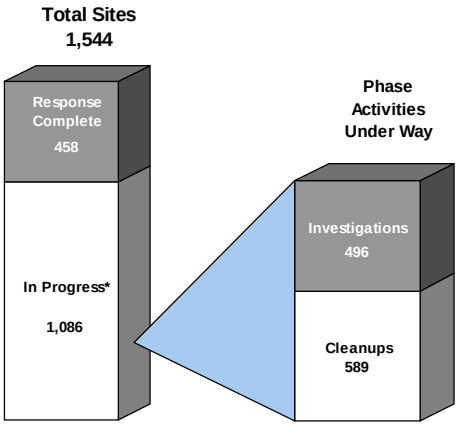


In fiscal year 1998 (FY98), the Air Force continued to make substantial progress toward completion of its restoration program, reducing risk to human health and the environment. Strong stakeholder involvement, stable funding, and the application of relative risk "plus" factors continue to be used successfully to sequence site and installation cleanup activities.

Active Site Status as of September 30, 1998



BRAC Site Status as of September 30, 1998

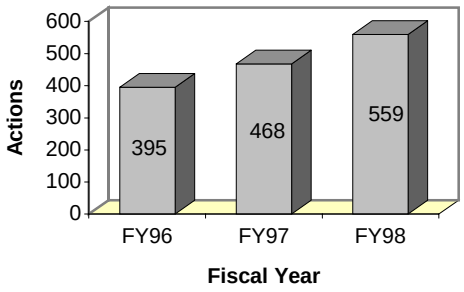


*NOTE: IN-PROGRESS INCLUDES SITES WHERE ACTIVITIES WILL BE UNDER WAY IN THE FUTURE. THEREFORE, TOTALS OF SITES WITH PHASE ACTIVITIES UNDER WAY ARE GENERALLY LESS THAN THE TOTAL NUMBER OF SITES IN PROGRESS.

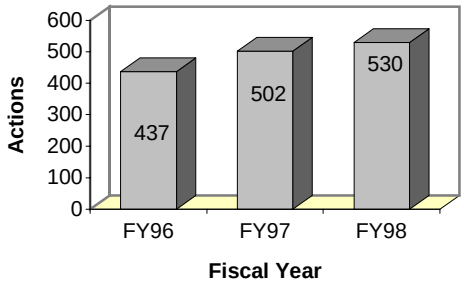
Program Execution

In FY98, the active Air Force added 197 new sites to its restoration inventory, bringing the Air Force active installation site total to 4,494. Of these sites, 2,268 require no further action except long-term monitoring, and 2,226 are either in progress or have future restoration actions planned. Of the sites in progress, 1,223 have investigations under way, 886 have cleanup actions in progress, and 117 have future actions planned. In addition, 148 Air Force sites require long-term operations.

Cumulative Interim Actions Completed at Active Sites



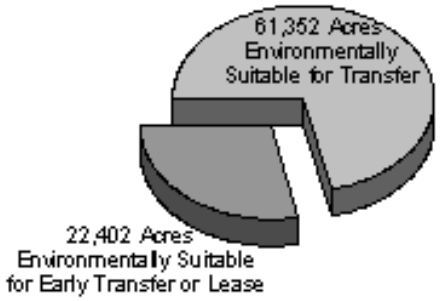
Cumulative Interim Actions Completed at BRAC Sites



NOTE: INTERIM ACTION NUMBERS CHANGED FOR THE AIR FORCE BEGINNING IN FY96 AS A RESULT OF THE TRANSFER OF 134 SITES TO BRAC. ALSO, THE AIR FORCE INSTITUTED QUALITY ASSURANCE / QUALITY CONTROL REPORTS TO ENHANCE THE FIDELITY OF DATA CONTAINED IN ITS INFORMATION MANAGEMENT SYSTEM. THE REPORTS REVEALED A "DOUBLE-COUNTING" OF INTERIM ACTIONS AT SOME SITES. CORRECTIONS WERE MADE WHERE NECESSARY.

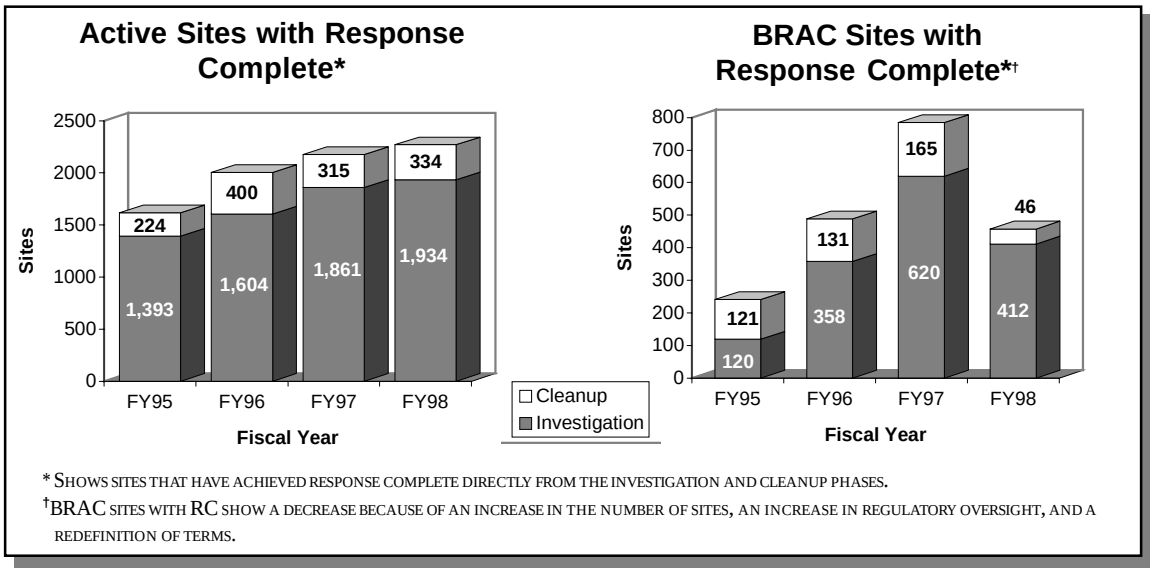
Thirty-one Air Force installations were recommended for closure or realignment in the 1988, 1991, 1993, and 1995 rounds of the Base Realignment and Closure (BRAC) program. Environmental Baseline Surveys and BRAC Cleanup Plans have been completed for all Air Force BRAC installations. In FY98, cleanup actions were completed at 91 BRAC sites. As a result, 73 percent of the property at the Air Force BRAC installations is environmentally suitable for transfer.

Environmental Condition of BRAC Property



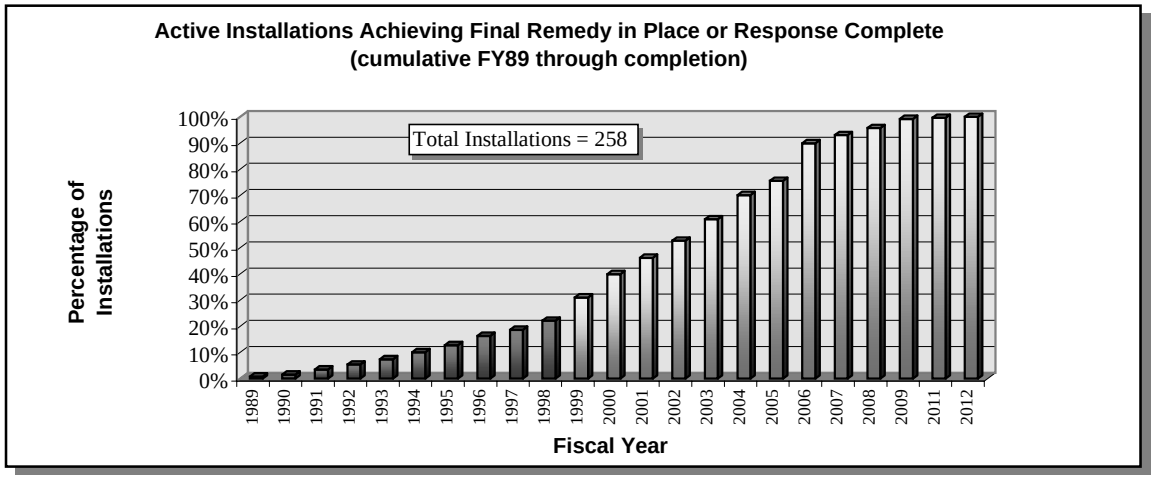
Response is complete at 2,268 of the 4,494 sites at Air Force active installations that are funded by the Air Force Environmental Restoration Account (ERA). At the 2,226 remaining sites, investigation, design, or cleanup actions are in progress. In FY98, the Air Force completed 91 interim actions at active installations, bringing the total number of interim actions completed at active installations to 559 at 507 sites. During FY98, 19 active installation sites were brought to Response Complete status through cleanup activities. In addition, 73 additional active installation sites were determined to require no further action or to be Response Complete on the basis of appropriate investigations and analysis.

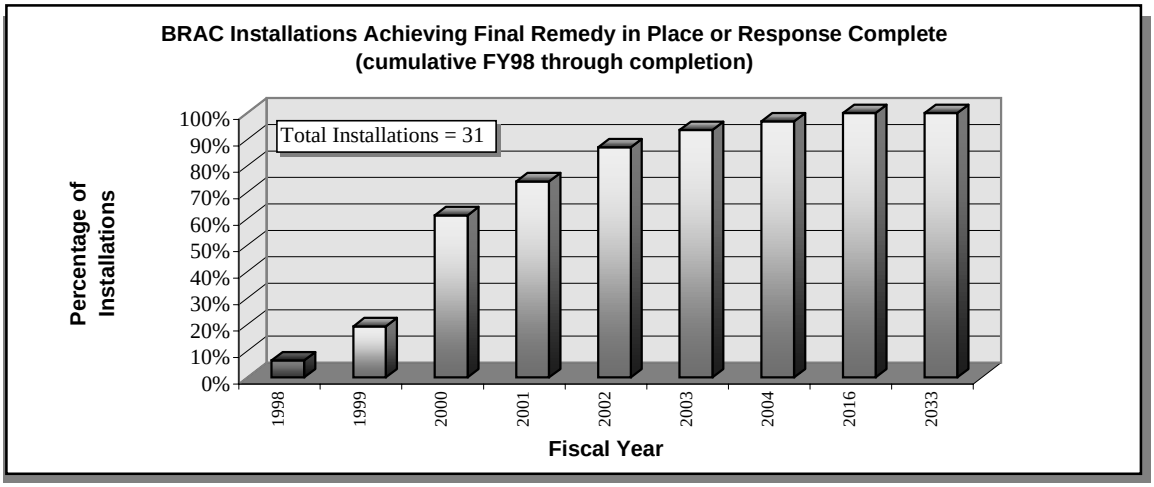
Response is complete at 458 of the 1,544 sites at Air Force BRAC installations. Investigation, design, or cleanup actions are in progress at the 1,086 remaining sites. In FY98, the Air Force completed 28 interim actions, bringing the total number of interim actions completed at BRAC installations to 530 at 449 sites. Also during FY98, seven



* SHOWS SITES THAT HAVE ACHIEVED RESPONSE COMPLETE DIRECTLY FROM THE INVESTIGATION AND CLEANUP PHASES.

†BRAC SITES WITH RC SHOW A DECREASE BECAUSE OF AN INCREASE IN THE NUMBER OF SITES, AN INCREASE IN REGULATORY OVERSIGHT, AND A REDEFINITION OF TERMS.





BRAC installation sites reached Response Complete status through cleanup activities. Forty-eight additional BRAC installation sites were determined to require no further action or to be Response Complete on the basis of appropriate investigations and analysis.

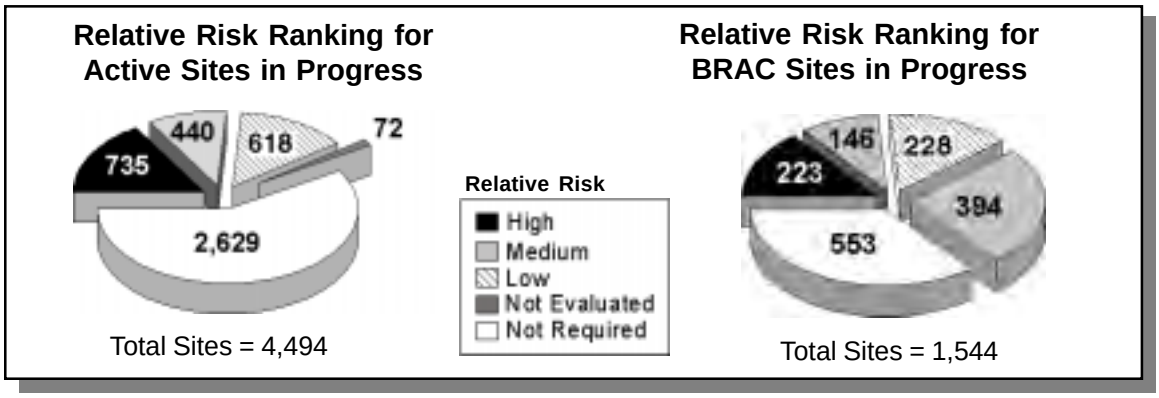
Program Accomplishments

In FY98, the Air Force Base Conversion Agency (AFBCA) achieved U.S. Environmental Protection Agency (EPA) concurrence on Operating Properly and Successfully (OPS) demonstrations for a landfill remedy at Pease Air Force Base and a groundwater extraction system at Mather Air Force Base. EPA has given concurrence on only six such demonstrations nationwide. The OPS demonstrations are the second and third by the AFBCA; Norton Air Force Base obtained OPS concurrence in 1994. EPA concurrence at Pease and Mather allows these installations to begin transferring the properties.

AFBCA, in cooperation with EPA's Federal Facilities Restoration and Reuse Office and Technology Innovation Office, also is sponsoring a national conference on optimizing monitoring systems. AFBCA believes that up to 25 percent of long-term cleanup costs can be avoided through these efforts. AFBCA has continued its FY97 efforts to optimize the performance and cost-effectiveness of its own long-term remediation and monitoring systems. The agency's three-pronged strategy involves optimizing existing remedial and monitoring systems through development and use of the Remedial and Monitoring System Optimization Guides; developing cost-effective contracts that are tailored to the operation and maintenance of such systems, with incentives for achieving cleanup objectives on schedule and under budget; and using emerging cleanup and monitoring technologies geared toward remedial and monitoring systems with time frames of over 10 years. Through these efforts, with regulatory participation, AFBCA expects to lower monitoring costs by 10 to 25 percent.

Relative Risk Evaluation

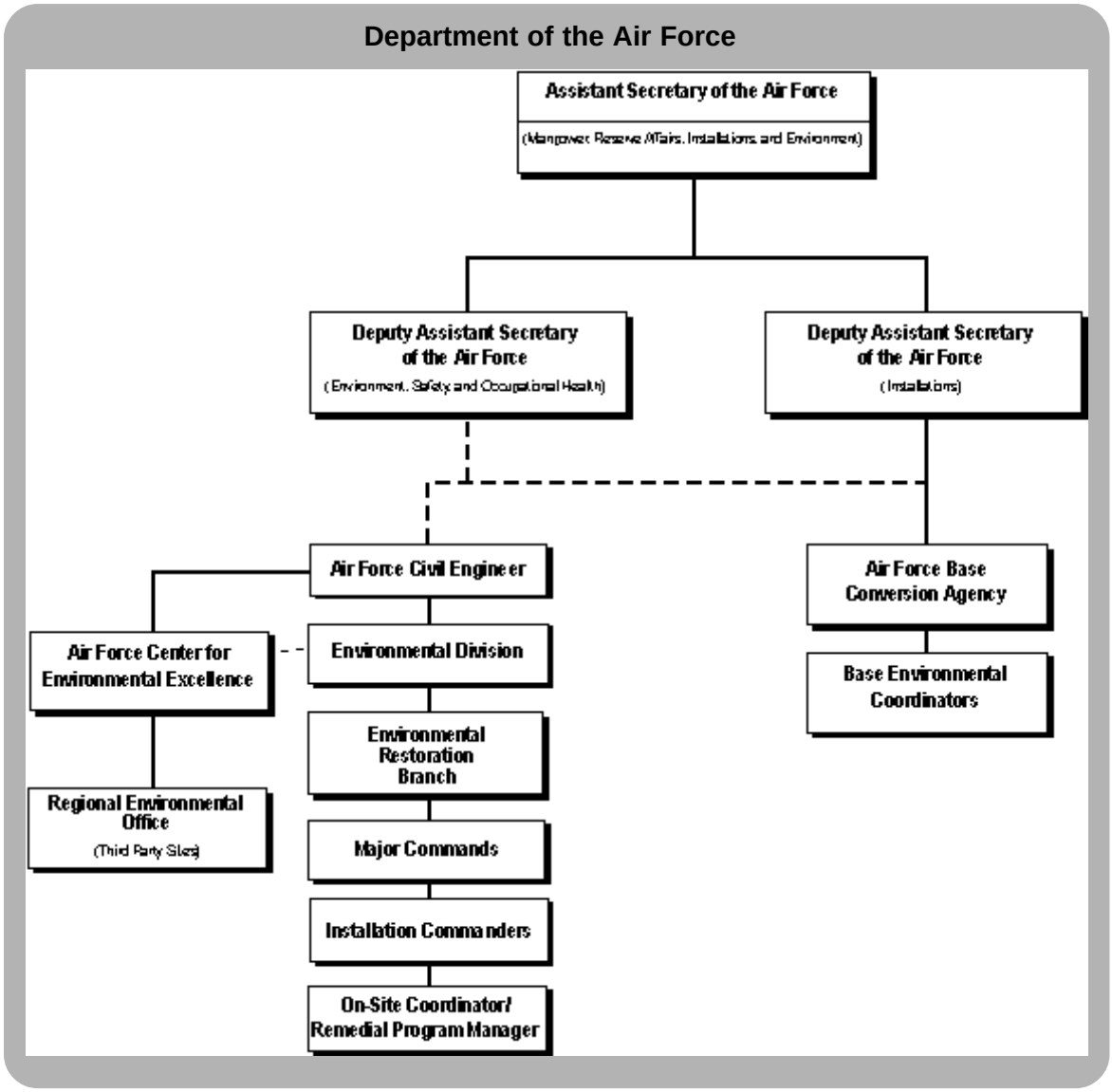
The Air Force uses relative risk site evaluations as a primary factor in sequencing work. Relative risk "plus" factors, including legal requirements, stakeholder concerns, program execution, and economic impacts, are also considered. Of the 2,226 sites in progress at active Air Force installations, 735, or about 33 percent, are categorized as high relative risk. Of the 1,086 sites in progress at closing Air Force installations, 223, or about 20 percent, are categorized as high relative risk.



Management Initiatives

The Air Force plans to schedule and participate in EPA regional program reviews in FY99. The reviews will be reformatted to provide more two-way communication and to incorporate additional requested information.

Major Command (MAJCOM) restoration program management reviews (PMRs) were conducted in FY98. These reviews incorporated information reported in the Air Force Restoration Information Management System by installations and MAJCOMs. Reviews focused on identifying sites that were not meeting the goals set forth in the Defense Planning Guidance, funding issues, and cleanup program success stories. PMRs are scheduled for the second quarter of FY99. The Air Force plans to conduct PMRs on a semi-annual basis.



Program Direction

In FY98, AFBCA led an Air Force initiative to define the site closeout process for the Department of Defense (DoD) and the Air Force. These efforts have brought the Air Force national recognition from the states, EPA, and DoD. In less than a year, the initiative has improved the understanding of what remains to be accomplished in the cleanup program. To achieve this, the initiative's cooperative working group produced a site closeout process guide, developed an interactive Web site (which includes process guidance, case studies, model documents, and other site closeout resources), and conducted numerous briefings and workshops at more than 20 national environmental forums. Before this project began, there had been no definitive, comprehensive source of information on the site closeout process. Numerous documents with differing definitions, milestones, and requirements were available; however, there was no single framework or blueprint for completing cleanup work beyond remedy selection. The Air Force initiative's guidance and interactive Web site will save federal, state, and military cleanup teams substantial time by improving the process's consistency and the understanding of the process.

AFBCA also led a cooperative DoD, EPA, and state effort to develop strategies for achieving site closeout. This effort will soon become the DoD initiative guidance for reaching site closeout and ensuring that cleanup responses are complete.

The Air Force also continues to apply all available resources to accomplishing the goals outlined in the *Air Force Environmental Program Management Guidance:*

- Reduce risk to human health and the environment. Take appropriate, timely action to reduce or eliminate potential risks to human health and the environment posed by environmental contamination.
- Comply with federal, state, and local regulatory requirements and orders pertaining to cleanup of the environment and eliminate the need for any enforcement actions.
- Develop partnerships. Enhance and sustain the Air Force environmental commitment through productive partnering and active community-involvement programs.
- Involve stakeholders. Where there is sufficient and sustained community interest, establish Restoration Advisory Boards (RABs) including representatives of federal, state, and local regulatory agencies and the local community.
- Evaluate cost and performance. Use new, innovative, or best available technologies that expedite the cleanup process and lower costs while achieving cleanup results that are as good as, or better than, those achieved through use of standard technologies.
- Enter into cleanup agreements when legally required or when deemed to be in the Air Force's and stakeholders' best interest in facilitating cleanup. Continue to comply with all existing agreements. Agreements shall reflect realistic schedules that are consistent with Air Force ERA funding allocations.

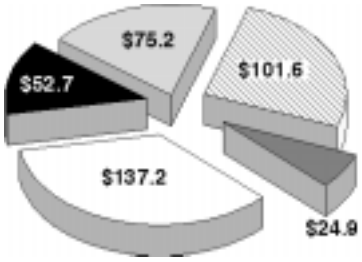
- Prevent future contamination by preventing pollution and minimizing waste.
- Consider future land use in developing cleanup strategies.
- Ensure that all actions that are necessary for protection of human health and the environment are taken before sale or transfer of property from the United States to any other person or entity, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act and DoD policy.

Funding

In FY98 the Air Force obligated $376.9 million in environmental restoration funds, approximately 29 percent of the overall ER FY98 DoD program budget. Current planning estimates indicate that the Air Force's environmental restoration funds will decrease to $371.1 million in FY99, then increase to $376.8 million in FY00. In FY98, approximately 61 percent of Air Force environmental restoration funds was spent on design work, interim or final cleanup actions, and operation and maintenance. That percentage is expected to increase to 67 percent in FY99 and to increase to 73 percent in FY00.

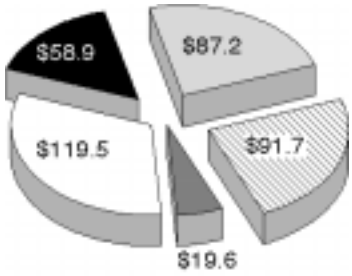
Air Force Environmental Restoration Funding Profile (in millions of dollars)

FY97 ER, Air Force Funds Executed

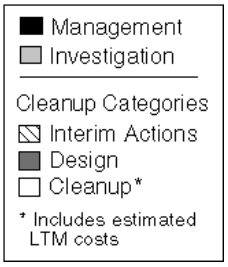


Total = $391.6 million

FY98 ER, Air Force Funds Obligated



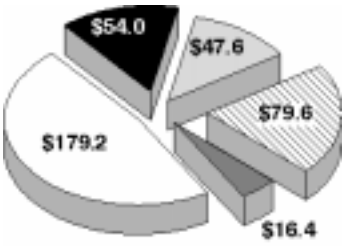
Total = $376.9 million



FY99 ER, Air Force Execution Planned

Total = $371.1 million

FY00 ER, Air Force Planning Estimate



Total = $376.8 million

NOTE: FOR BRAC FUNDING INFORMATION, SEE FIGURE 22 ON PAGE 34.

Outreach

The Air Force is dedicated to involving the public in its cleanup program in a way that allows timely and meaningful input from stakeholders on cleanup priorities. Involving the public is crucial to establishing trust and credibility throughout the cleanup process.

The Air Force periodically surveys communities where there has been little or no sustained community interest in forming a RAB to determine whether such interest has developed. In addition, in FY98, AFBCA hosted a review of the FY99 program for BRAC cleanup teams (BCTs). This review provided an opportunity for discussion, explanation, and coordination of fiscal issues. It also supplied guidance to the BCTs on long-term strategies for achieving response complete and site closeout.

The Air Force also has formed active partnerships with regulatory agencies, communities, and industry to reduce the cost of cleanup through effective application of technology. For example, to improve cooperation between the Air Force and EPA Region 4, the Air Force held regular partnering sessions focusing on site remediation and closure, resolution and avoidance of conflict, legal requirements, and sharing responsibility for solutions. The goal of this partnership is to foster harmony and commitment to the cleanup process. The structured partnering practiced in Region 4 is part of a range of options available to Air Force installation restoration program managers.

These various efforts reflect the Air Force's commitment to maintaining an open, visible, and accountable cleanup program whose ultimate goal is cleanup completion. By working steadily toward this goal, the Air Force will sustain public trust and faith in the program.

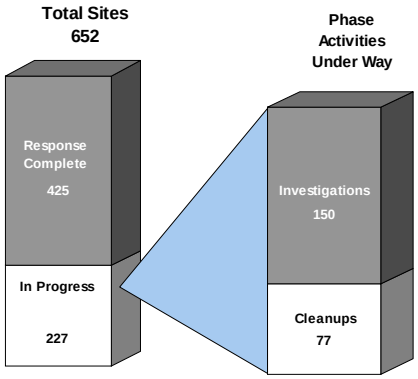
DLA

Cleanup Status and Progress

"Completion of restoration of contaminated sites on DLA installations continues to be one of my highest priorities. We owe it to future generations to correct past errors and maintain our facilities in ways that will assure those mistakes are not repeated. Likewise, we continue to address cleanup at our closing installations as quickly as possible so properties can be returned to communities in support of the President's program for economic reuse. All of this is being accomplished, not in a vacuum, but in partnership with both federal and state regulators as well as with the communities that we all serve."

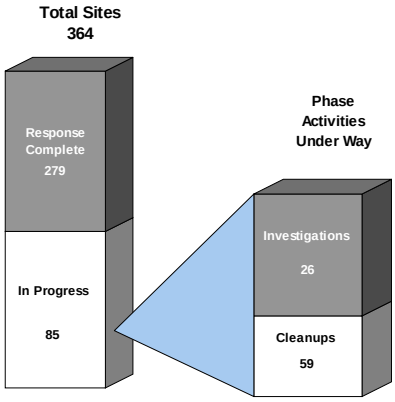
— Henry T. Glisson, Lieutenant General, USA, Director, Defense Logistics Agency

Active and BRAC Site Status as of September 30, 1998

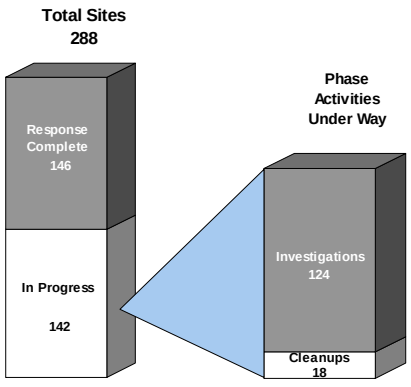


The Defense Logistics Agency (DLA) is a combat support agency headquartered at Fort Belvoir, Virginia. DLA is responsible for providing the Department of Defense (DoD) and other federal agencies with a variety of logistics, acquisition, and technical services in peace and war. These services include inventory management, procurement, warehousing, and distribution of spare parts, food, clothing, medical supplies, construction materials, and fuel; administration of all

Active Site Status as of September 30, 1998



BRAC Site Status as of September 30, 1998



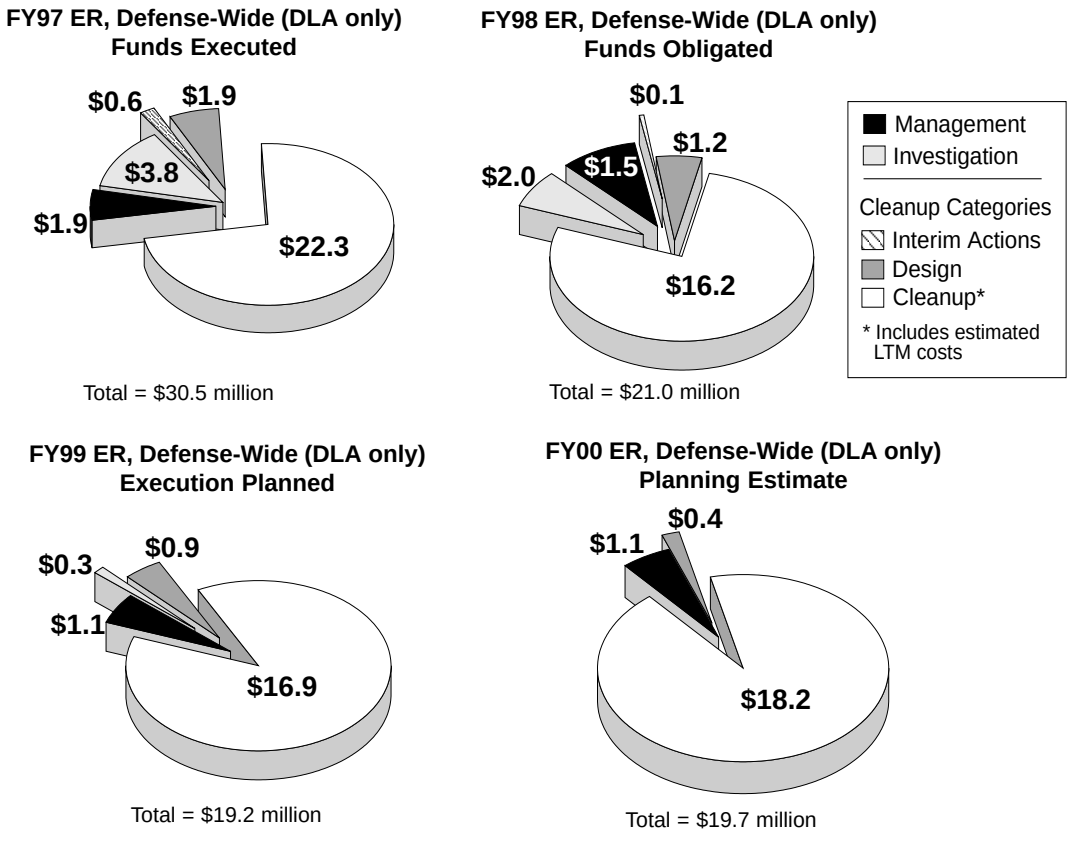
acquisition contracts for military service weapon systems; and reutilization and disposal of material that is obsolete, worn out, or no longer needed.

DLA also provides the Military Departments and the nation with several environmental services, including hazardous waste disposal, technical information on hazardous waste, fuel services, management of the ozone-depleting substances reserve, and storage and maintenance of stockpiles of strategic and critical materials for national defense.

Associated with some of these services is the responsibility for environmental compliance and cleanup. For example, DLA is involved in cleanups at 45 active third-party sites where contamination has resulted from improper disposal or transfer of DoD hazardous wastes. Under DLA's Defense National Stockpile program, unique environmental issues arise in relation to storage, disposal, and sale of materials such as asbestos, lead, mercury, and thorium nitrate. At the end of fiscal year 1998 (FY98), DLA had a total of 652 sites in its environmental restoration program. The primary contaminants of concern at these sites are fuels, solvents, polychlorinated biphenyls (PCBs), and heavy metals.

DLA cleanup efforts at active installations are funded by the Defense-wide Environmental Restoration Account (ER, Defense-wide).

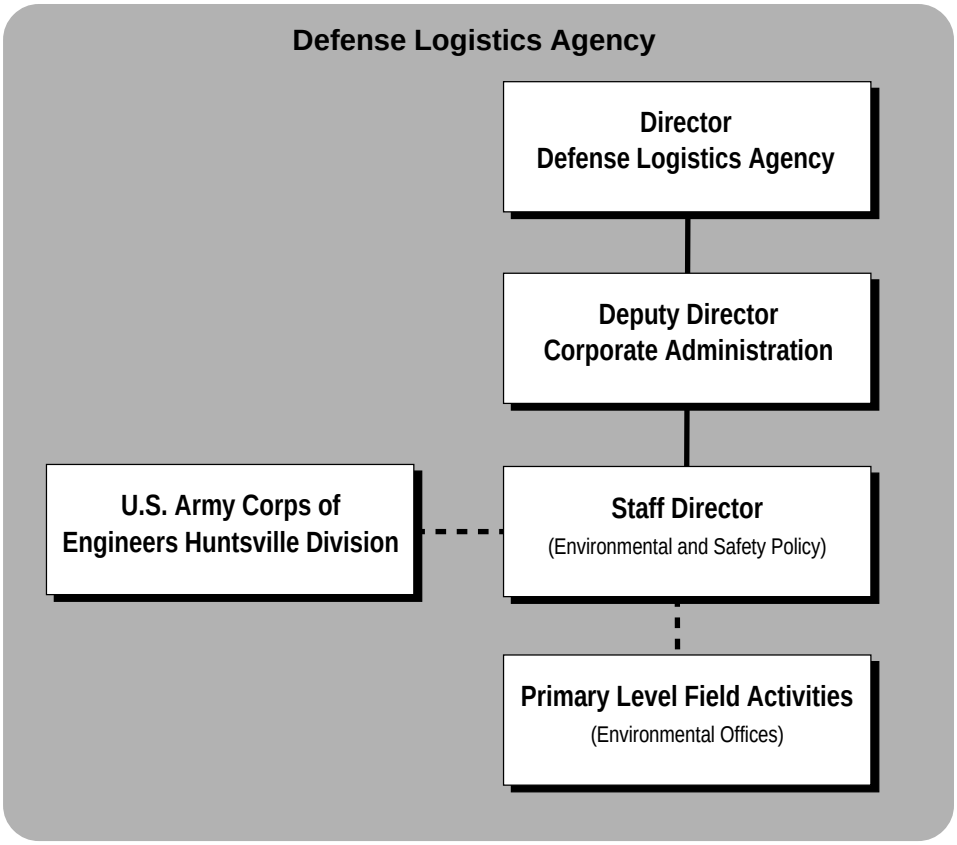
DLA Environmental Restoration Funding Profile (in millions of dollars)



NOTE: FOR BRAC FUNDING INFORMATION, SEE FIGURE 22 ON PAGE 34.

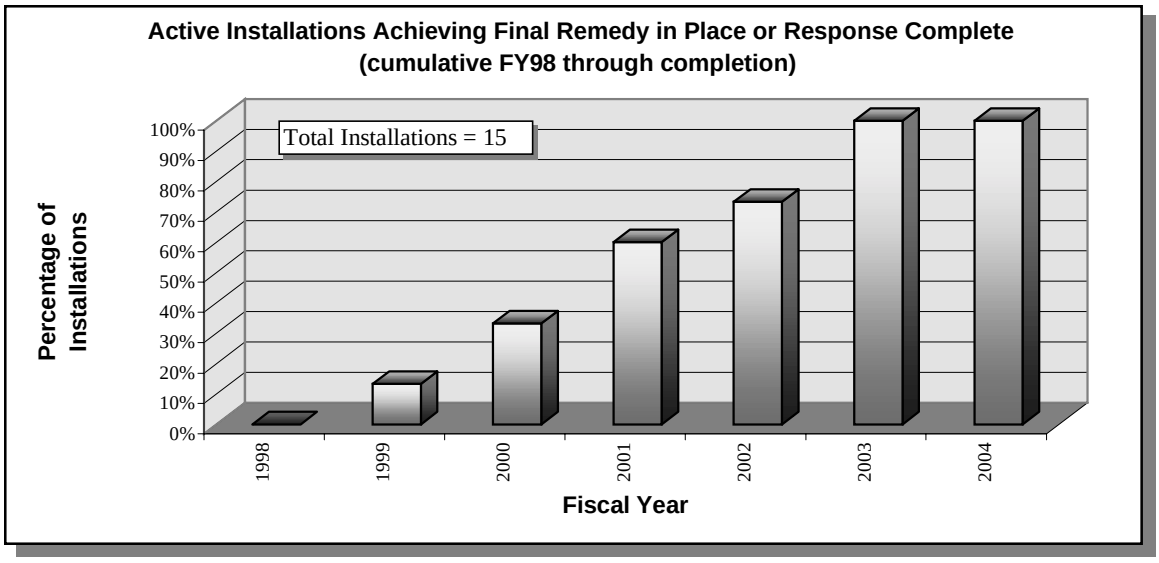
Program Execution

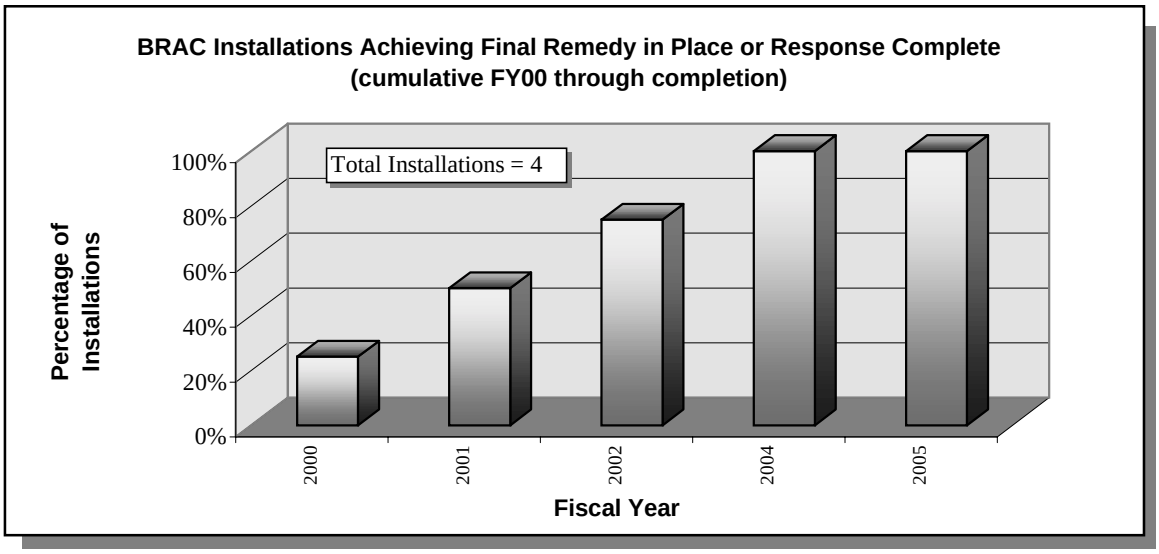
DLA has a staff of 475 environmental specialists. These specialists are located throughout the world and are responsible for ensuring that DLA's activities are conducted in full compliance with applicable environmental requirements. The DLA logistics mission gives the agency special opportunities to provide services and support that are critical to the environmental programs of its military service customers. The goal of DLA's cleanup program is to reduce risk to human health and the environment by expediting remediation of past hazardous material management sites. DLA is making good progress in its cleanup program and is meeting all DoD cleanup goals on time, and in some cases, ahead of schedule. The U.S. Army Corps of Engineers (USACE) handles the bulk of DLA's cleanup program. Most of the contracts administered by USACE for this work are cost-reimbursement-type contracts. Performance-based contracting is used at all DLA sites, and the results have been very good, promoting innovation and increasing cost-effectiveness.



Program Accomplishments

The accomplishments of the DLA cleanup program reflect the program's complexity and its many, diverse goals. In particular, these achievements illustrate how DLA advances and harmonizes the competing needs of safeguarding the environment, conserving limited funds, reusing property at closing installations, and, above all, safeguarding human health. Initiatives at individual DLA facilities illustrate the agency's success in these areas.





Recycling

At the Defense Distribution Depot Susquehanna, Pennsylvania (DDSP), DLA recycled demolition debris from a closed laundry, realizing cost savings while attaining environmental objectives. The facility, Building T-21, was demolished to enable DDSP to remediate trichloroethene-contaminated soil and groundwater that lay beneath the building. After demolition, most of the building debris was recycled. All of the steel was recycled off site and all of the concrete was crushed on site into stone. The stone, which remained on site, is being used to improve the DDSP perimeter roads and for other projects throughout the depot. Recycling the concrete on site was not only far less expensive than taking it off site for disposal but also saved the depot the expense of purchasing stone for the roadway. In addition, reusing the concrete on site allowed the contractor to avoid taking up valuable landfill space.

Reusing Property

In 1998 the cleanup and reuse effort at the Defense Electronics Supply Center at Gentile Air Force Station in Dayton, Ohio, was recognized, when the center was named Facility of the Year by the National Association for Installation Developers.

The center was closed by the Base Realignment and Closure (BRAC) Commission in FY93. Instead of viewing this event as a calamity, the City of Kettering used it to create new economic opportunities. The city is now working with DLA and the Air Force Base Conversion Agency to turn this vision into a reality. Today, the Kettering Business Park is home to eight businesses and provides 1,765 jobs. The city plans to bring an additional 1,800 employees into the park.

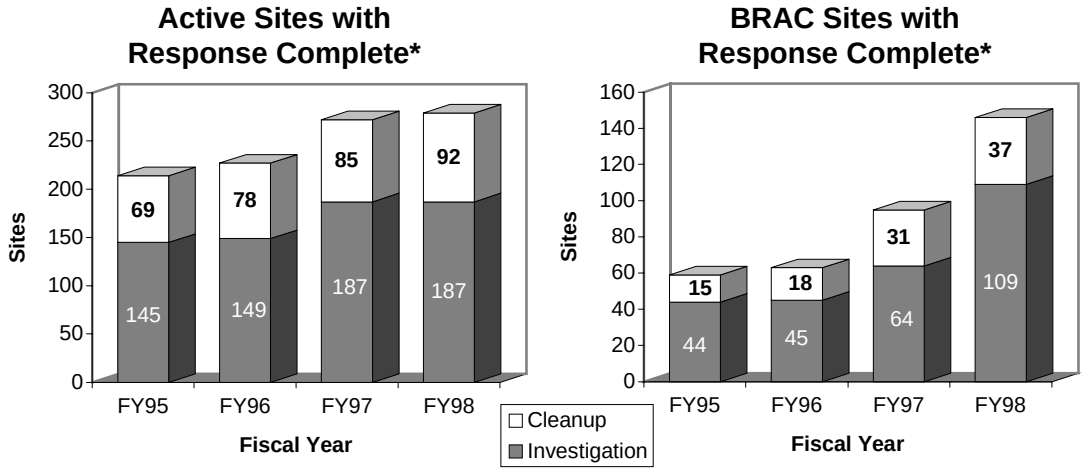
The City of Kettering began reconstructing the property, demolishing buildings, rebuilding roads, and installing fiber-optic cable and new utility systems, while environmental restoration work was still in progress. To facilitate these efforts, DLA and the Air Force worked to ensure that the cleanup of the property was conducted as quickly and safely as possible. Cleanup of the property began in June 1997 and is expected to be complete by December 1999. The target date for having the final environmental remedy in place is August 2000. At that time, only long-term monitoring will be necessary for protection of human health and the environment.

Cost Avoidance

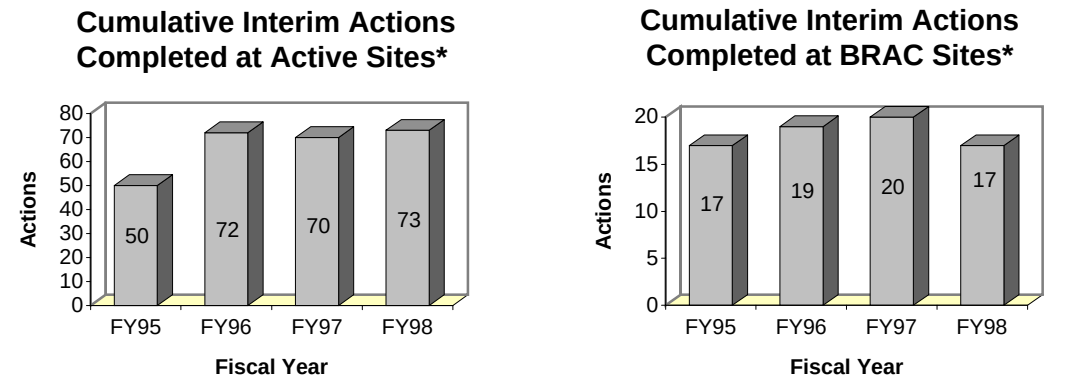
At DLA's Defense Supply Center Richmond, regulatory assistance helped DLA realize substantial savings. The soil at the former fire-fighter training pit on this property has been determined to contain various chemicals. The proposed plan for addressing this contamination required excavation and off-site disposal of approximately 1,300 cubic yards of soil. This proposed plan was presented to, and accepted by, EPA management. However, during the subsequent final review by the EPA toxicologist, it was noted that EPA's risk assessment numbers had been revised since the original evaluation of the area. With use of the new risk assessment numbers, it was shown that the area did not present a risk that would require excavation. The proposed plan is thus being revised, with "no action" selected as the preferred alternative. This modification resulted in avoidance of approximately $1.25 million in unnecessary cost.

Investigating Health Impacts

DLA's Defense National Stockpile Center (DNSC) is working with the New York State Department of Environmental Conservation and the Broome County Health Department to conduct sampling at the Binghamton Depot and evaluate the installation's potential impact on the local community. This effort was spurred by the presence of a cancer cluster affecting young children in the area. DLA is working to ascertain and demonstrate that DNSC is not the cause of these illnesses. In addressing this serious concern, DNSC has developed an outstanding working relationship with both the county and the state.



* Shows sites that have achieved response complete directly from the investigation and cleanup phases.



* The number of Interim Actions declined from FY96 to FY97 for active installation sites and from FY97 to FY98 for BRAC sites because several Interim Actions were reclassified as final remedial actions.

Partnerships

Partnerships with regulatory agencies, contractors, and community representatives are a cornerstone of DLA's cleanup program. In FY98, partnering at the Defense Energy Support Center, Defense Distribution Depot Memphis (DDMT), Defense Supply Center Richmond (DSCR), and Defense Distribution Depot Susquehanna were particularly productive, saving time and improving program execution.

Defense Energy Support Center

DLA's Defense Energy Support Center developed an effective partnership with its environmental consultant and the state regulators in its cleanup of a former fuel storage facility in Harpswell, Maine. DESC used face-to-face meetings instead of correspondence for discussion of remedial alternatives, resolution of cleanup issues, and achievement of consensus on the tasks required to bring the site to closure. This cooperative spirit fostered trust and mutual respect among all parties in the cleanup and allowed DLA to move this site to closure much faster than it could have if it had kept regulators at arm's length.

Defense Distribution Depot Memphis

On June 1 and 2, 1998, the former Defense Distribution Depot Memphis facilitated a partnering session in Jackson, Tennessee. Participants included USACE, the contractors working for the depot, state and federal regulators, DLA headquarters personnel, and the Office of the Secretary of Defense BRAC Closure and Transition Office. The session was part of an ongoing effort to improve communication and to understand the processes through which other agencies interact with DLA. This effort has been very beneficial in moving the cleanup program ahead in Memphis and in improving the depot's standing in the community.

Defense Supply Center Richmond

DLA's Defense Supply Center Richmond, EPA, and the Virginia Department of Environmental Quality (VDEQ) recently agreed to expand their partnering initiatives. According to its original Interagency Agreement (IAG), DSCR was required to hold quarterly technical review committee (TRC) meetings, which it has done. During 1998, however, the group elected to go beyond what was required. Responding to the VDEQ representative's comments about partnering in another group in which he was involved, the TRC decided to expand its meeting schedule, on a trial basis, adding eight detailed planning meetings per year to the required quarterly meetings. The addition of these detailed planning sessions allowed the TRC to reformat the required quarterly meetings to accommodate participants who wanted a less detailed view of the program. As a result of this expanded schedule, the TRC changed the format of the quarterly meetings to include only an overview of the program along with information on what had been accomplished since the previous meeting. Attendance at the TRC meetings also "expanded" in FY98 to include representatives of the Water Board, Chesterfield County, and contractors working on the operations and maintenance portion of the program.

Defense Distribution Depot Susquehanna

The Pennsylvania Department of Environmental Protection (PADEP) and DoD recently implemented a multisite agreement (MSA). This partnering tool has been, and will continue to be, a very useful tool for the Installation Restoration Program. DLA's Defense Distribution Depot Susquehanna, Pennsylvania, has submitted, as requested, the first MSA data request to PADEP. PADEP and the Baltimore District of USACE hosted a DoD Workshop on Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2). DDSP's cleanup contractor and regulatory personnel associated with the Act 2 process also attended.

Outreach

DLA recognizes the importance of its relationships with the communities surrounding its installations. In reaching out to its neighbors, DLA not only fulfills a public trust, but also taps a valuable resource. Community outreach efforts at two DLA facilities were particularly productive in FY98.

Defense Distribution Depot Memphis

In FY98, the efforts of the DDMT BRAC cleanup team led to an early removal action at the base housing complex in support of the McKinney Act, a law promoting housing for the homeless. The base housing is scheduled for reuse for this purpose in calendar year 1999. The environmental condition of other land parcels is also continually reviewed to support leasing and transfer. The BCT's dual real estate and cleanup perspectives have enabled it to accommodate reuse priorities while satisfying Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements.

One outreach effort for the depot involved DDMT's participation in the Greater Memphis Environmental Justice Workgroup. The DDMT BRAC Environmental Coordinator, the State of Tennessee's lead regulator, and a community relations contractor all participated in this group, which is supported and co-chaired by the Agency for Toxic Substances and Disease Registry. The workgroup's purpose is to determine what, if any, health impacts have been caused by the Memphis Depot and other industrial or urban sources of environmental contamination in the area. To date, the involvement of the depot and the state regulator has consisted of explaining the CERCLA process to workgroup participants and describing how that process has been implemented at the depot. It is not certain whether DLA personnel will continue to participate in the group, since it has tended to focus on more general environmental issues rather than on impacts specifically related to the depot.

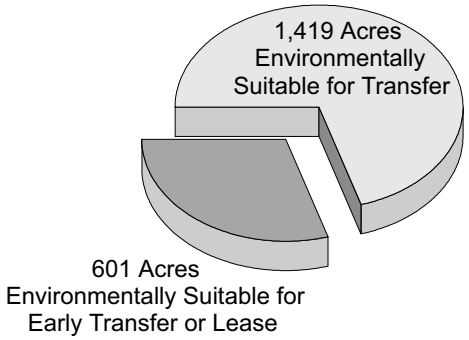
Defense Supply Center Philadelphia

Active and informed Restoration Advisory Boards (RABs) contribute substantially to the success of DLA's cleanup efforts. In FY98, community members of the Defense Supply Center Philadelphia (DSCP) RAB applied for and received Technical Assistance for Public Participation (TAPP) assistance to enhance their understanding of the technical aspects of DSCP's restoration program.

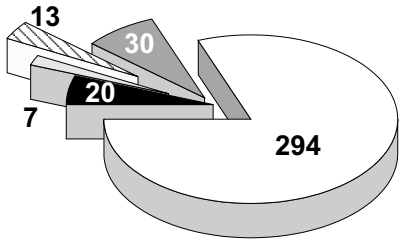
In 1996, a RAB was established at the DSCP, Pennsylvania, a facility affected by the 1993 BRAC round. In 1998, the community members of the RAB applied for, and received TAPP assistance. The purpose of this assistance was to help the community members better understand the technical aspects of DSCP's restoration program. The RAB agreed that "informed neutrality" would empower the community in local restoration decisions. Although DoD procured the TAPP provider, the RAB was encouraged to cite contractor preferences during the selection process. A contract was awarded, and the consultant now performs a variety of tasks for the RAB to ensure that the community is fully informed of all restoration activities.

RAB members agree that the TAPP has enhanced overall understanding of DSCP's cleanup program and has also strengthened overall community support and acceptance of DSCP's restoration activities, facilitating the return of the property to the community for redevelopment.

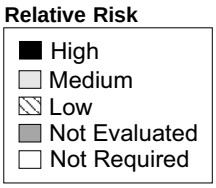
Environmental Condition of BRAC Property



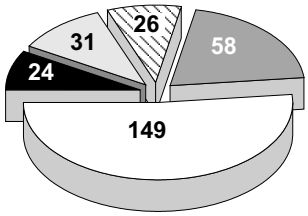
Relative Risk Ranking for Active Sites in Progress



Total Sites = 364



Relative Risk Ranking for BRAC Sites in Progress



Total Sites = 288

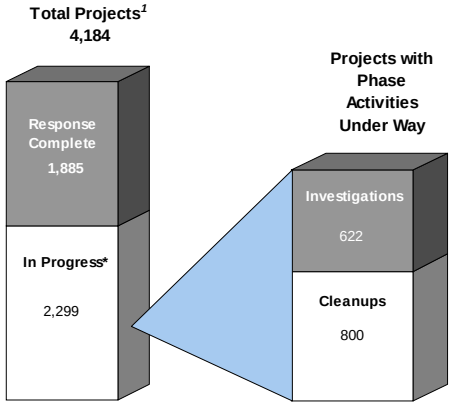
FUDS

Cleanup Status and Progress

"The Corps of Engineers' commitment to developing and fostering cooperative relationships with all interested parties in the cleanup of formerly used properties has enabled it to better accomplish its mission of protecting human health and the environment, ensuring a rapid and efficient response to environmental hazards."

— RAYMOND J. FATZ, DEPUTY ASSISTANT SECRETARY OF THE ARMY

FUDS Status as of September 30, 1998



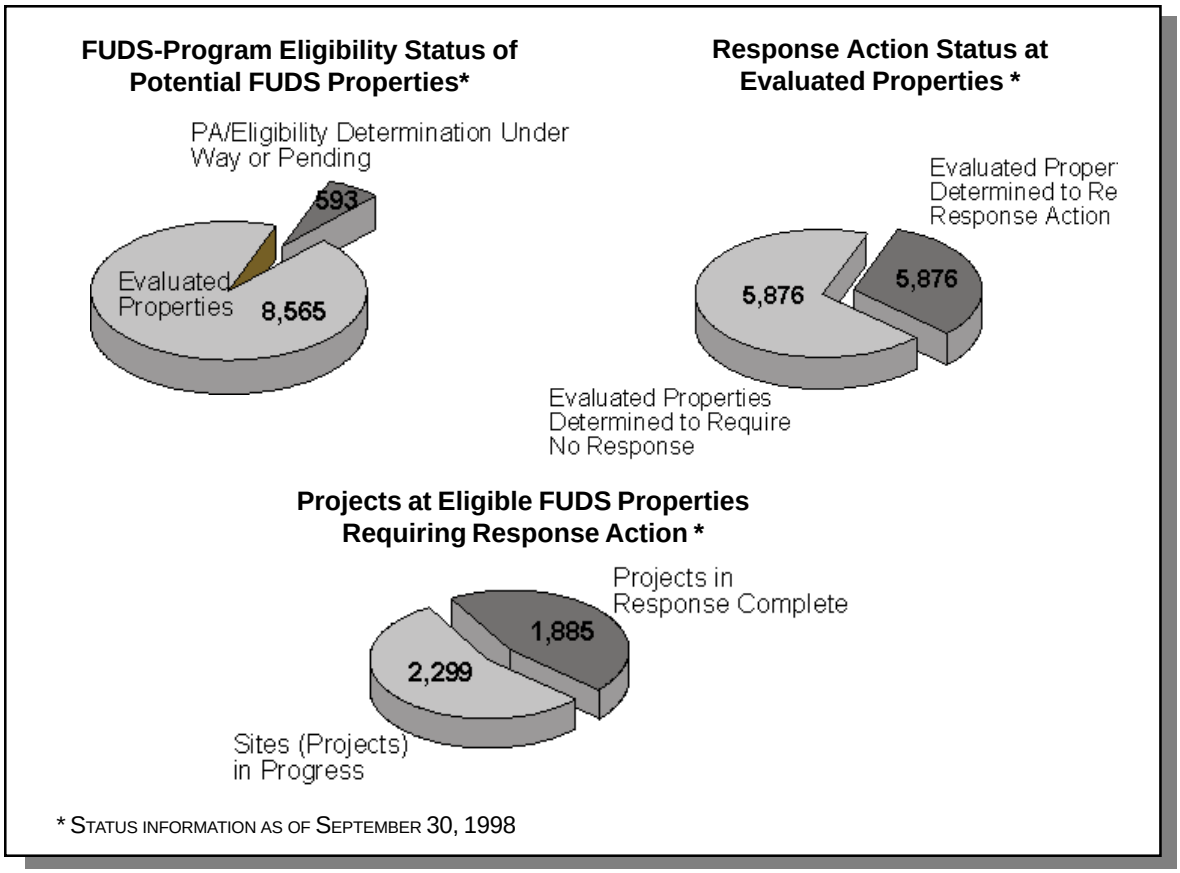
* NOTE: IN-PROGRESS INCLUDES PROJECTS THAT WILL BE UNDER WAY IN THE FUTURE. THEREFORE, TOTALS OF PROJECTS WITH PHASE ACTIVITIES UNDER WAY ARE GENERALLY LESS THAN THE TOTAL NUMBER OF SITES (PROJECTS) IN PROGRESS.

The Department of Defense (DoD) is responsible for cleaning up properties that were formerly owned, leased, possessed, or operated by DoD. Such properties are known as Formerly Used Defense Sites (FUDS). The Army is the executive agent for the program, and the U.S. Army Corps of Engineers (USACE) is the executing agent that manages and executes the program. Because DoD no longer owns or uses the FUDS properties, a USACE district effectively serves as the installation commander charged with executing environmental cleanup projects and associated responsibilities.

The scope and magnitude of the FUDS program are significant, with 9,158 properties identified for potential inclusion in the program. Environmental cleanup procedures at FUDS are similar to those at active DoD installations. However, information about the origin and extent of contamination, land transfer issues, past and present property ownership, and program policies must be evaluated before DoD considers a property eligible for the FUDS program.

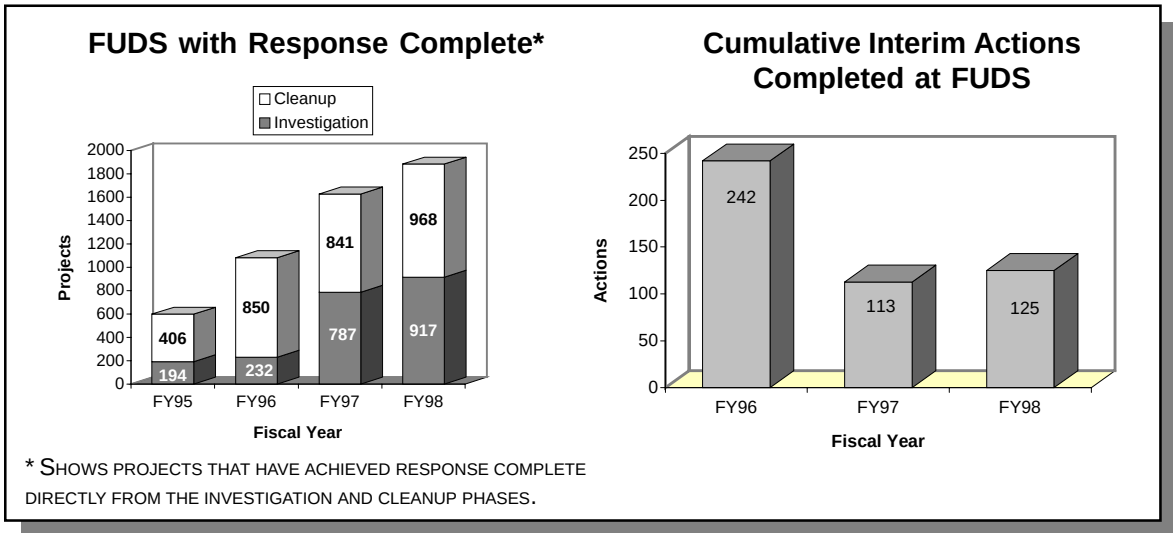
In fiscal year 1998 (FY98), 80 properties were added to the FUDS inventory, and preliminary assessments (PAs) were completed at 32 properties. Overall, 94 percent, or 8,565, of the 9,158 properties have been evaluated through the PA process, and 2,689 properties have been identified as requiring environmental response actions. On the 2,689 eligible properties, 4,184 potential cleanup projects[1] have been identified, and 1,885

[1] *FUDS cleanup projects are equivalent to sites. The term project will be used in place of sites throughout the FUDS section.*



of these projects have been completed. The total cost for completing the remaining 2,299 projects is estimated at $4.92 billion.[2]

FUDS project categories include hazardous, toxic, and radioactive wastes (HTRW); ordnance and explosives wastes (OEW); containerized HTRW (CON / HTRW), such as removal of underground storage tanks; building demolition and debris removal (BD / DR); and potentially responsible party (PRP) actions.



[2] *FY99-Completion does not include inflation adjustment for cost-to-complete beyond FY2005. The cost to complete (FY06-Complete) is based on FY99 dollars.*

During FY98, USACE headquarters officially responded to 25 congressional actions and one gubernatorial action, in addition to many informal congressional inquiries. USACE districts also responded to many additional congressional letters.

Program Execution

USACE helps the Army and DoD meet the challenge of protecting and cleaning up the environment through an organization that includes a headquarters, divisions, districts, laboratories, and centers of expertise. More than 92 percent of USACE environmental staff are on the front lines in USACE districts, executing projects. The divisions supervise design districts that perform studies and create designs and geographic military districts that manage projects and supervise construction. Cleanup activities at FUDS properties are supported by an HTRW center of expertise and an ordnance and explosives (OE) center of expertise (both of which are responsible for technical oversight) and by research and development laboratories. The USACE environmental program encompasses all four pillars of the Army's environmental program (compliance, restoration, preservation, and conservation) and has as its goals the prudent stewardship of taxpayer funds and the responsible protection of human health and the environment. The USACE environmental program budget has grown from approximately $400 million in FY90 to more than $1.5 billion in FY98. The FUDS share of the program's FY98 budget was $242.3 million.

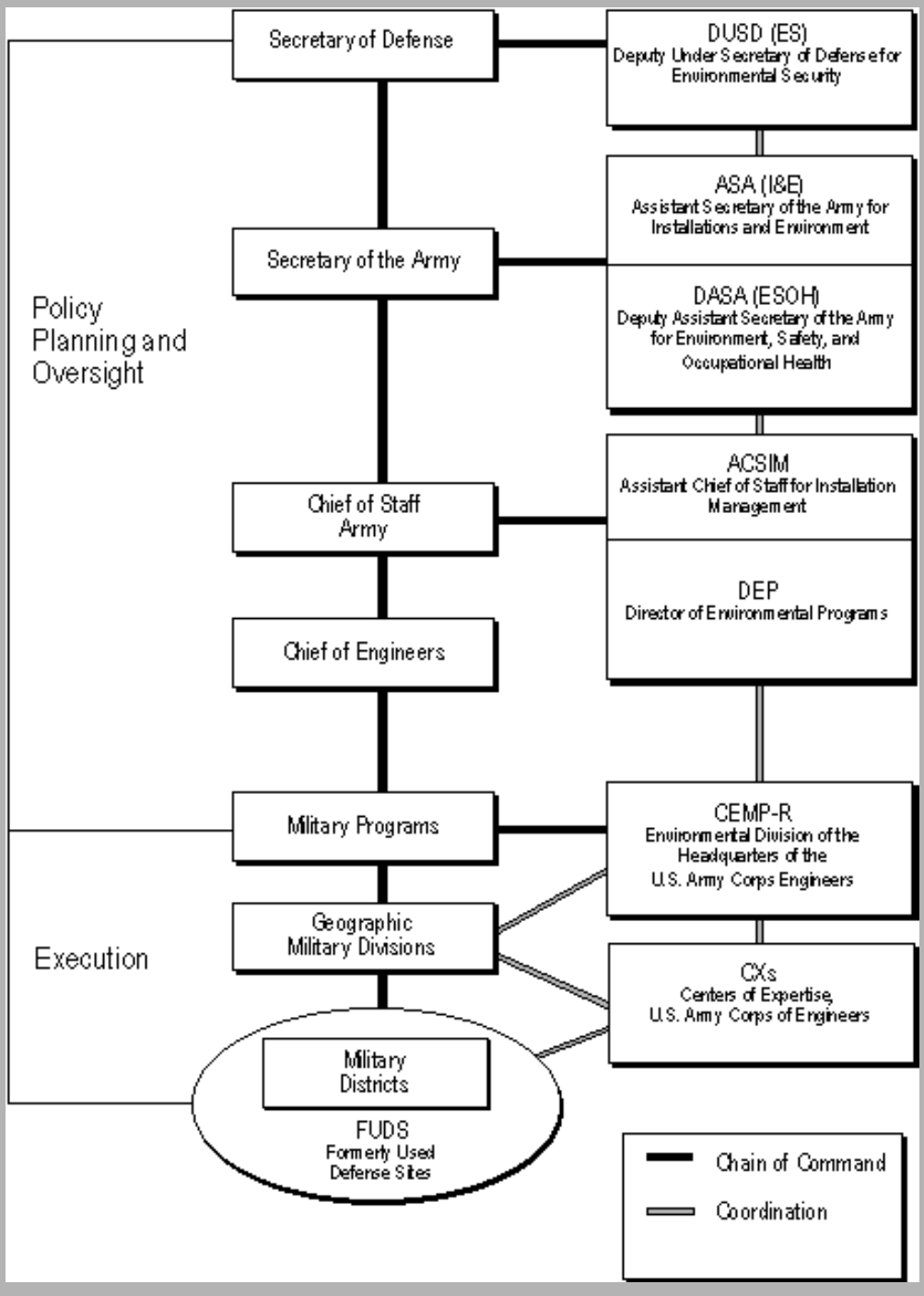
Goals and Priorities

The goal of the FUDS program is to reduce, in a timely and cost-effective manner, risk to human health, human safety, and the environment resulting from past DoD activities at these properties. Meeting environmental goals for FUDS properties depends on strong communication, partnerships, and community involvement among DoD and project stakeholders. Priorities for the FUDS program are based on an evaluation of relative risk and other factors, such as legal agreements, stakeholder concerns, and economic considerations.

Structure of Service

DoD is responsible for overall FUDS program policy and budget guidance, developing and defending the budget, and reviewing program performance. The Secretary of the Department of the Army is the program's executive agent and, through the Assistant Secretary of the Army (Installations and Environment) (ASA(I&E)), supplements DoD policies and oversees the program. The Director of Environmental Programs within the Office of the Assistant Chief of Staff for Installation Management establishes general program goals and, in concert with ASA(I&E), approves the annual work plan and program priorities. USACE headquarters is responsible for FUDS program management and execution. The FUDS mission within USACE is executed by the field organization, which consists of 7 geographic military divisions; 18 military districts, with necessary support from civil works districts; 1 HTRW center of expertise; and 1 OE center of expertise.

Organizational Structure of the FUDS Program



Program Accomplishments

USACE continues to emphasize executing projects, cleaning up sites, and ensuring that the public is an active participant in the cleanup process. Project execution figures for FY98 demonstrate that the FUDS program is making significant progress. As of September 30, 1998, 1,885 FUDS projects had reached response complete.

The following success story exemplifies the FUDS program's accomplishments in FY98.

Cleanup Program in Action:

Fire Training Simulators: Manchester Annex Superfund Site

In the fourth quarter of FY98, USACE, Seattle District, completed the demolition and cleanup of the fire training simulators at the former Naval Fire Training School at the Old Navy Dump / Manchester Annex Superfund Site.

This interim remedial action, which was completed in August 1998, involved removal and off-site disposal and recycling of 38,600 gallons of contaminated water, 876 gallons of petroleum product, 250 tons of concrete demolition debris, and 27 tons of scrap metal. USACE, Seattle District, closed the fire training simulator structures and the adjacent underground storage tanks and piping in place by cleaning them, demolishing them to below ground surface, and backfilling the site with approximately 700 cubic yards of clean fill.

Removing the fire training simulators early in the remedial design process has allowed USACE, Seattle District, to eliminate many unknowns in the design of the final cleanup remedy for the site. Remedial design of the overall cleanup remedy is scheduled for completion in the second quarter of FY99. Remedial action is scheduled for FY99 to FY00, at a current estimated cleanup cost of $5.4 million.

The successful cleanup of the former Naval Fire Training School was made possible by the relationships and partnerships that USACE, Seattle District, established with project stakeholders. As part of this effort, a work group, consisting of current property owners; community members; and representatives of state and federal regulatory agencies, state resource agencies, and tribal governments, was formed for the Manchester Annex Superfund Site. This work group provides a line of communication between USACE and project stakeholders. Several work group meetings were held at key stages in the design and cleanup stages of this project, facilitating progress and preventing delays.

Management Initiatives and Improvements

USACE continues to conduct initiatives to improve its efficiency and effectiveness in the use of its personnel and financial resources, administrative processing of resource documents, functional consolidation of resource responsibilities, and contracting.

In FY98, USACE finished converting the DOS-based FUDS database system to a user-friendly Web-based management information system (FUDSMIS). It also began developing the *FUDS Business Management Plan* based on DoD guidance. In addition, FUDS continues to work with the tri-service RACER (Remedial Action Cost Engineering and Requirements System) users group on the development of RACER 99 software and training requirements. RACER estimates the cost-to-complete for studies, remedial design, remedial action, and other site work; a FUDS version of the RACER 3.2 model was implemented in FY97 for HTRW, CON / HTRW, and BD / DR projects and reporting requirements. The FUDS cost-estimating policy has been modified to incorporate a quality assurance and quality control (QA / QC) process for selection of either RACER, a top-down parametric tool, or the bottom-up detailed cost-estimating tool, the Microcomputer-Aided Cost Engineering System (MCACES).

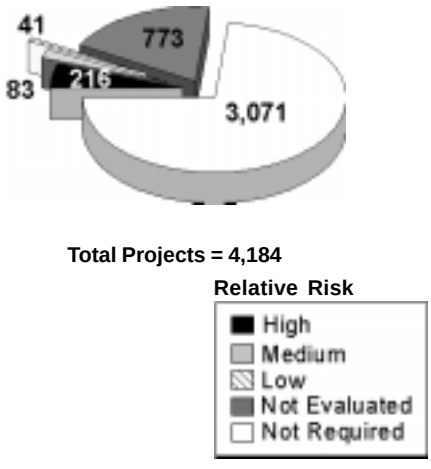
USACE has initiated a new cost management program to ensure that FUDS projects are executed at the lowest reasonable cost. Under this program, USACE determines the precise details of the work involved in various cleanup techniques and the work's typical cost.

The recent USACE reorganization has contributed to resource and organizational efficiencies that are expected to extend the usefulness of future environmental funding. In FY98, USACE management and support costs for the FUDS program fell to approximately 6.3 percent of total program costs, meaning that 93.7 percent of the environmental program's dollars go directly toward project execution at USACE districts.

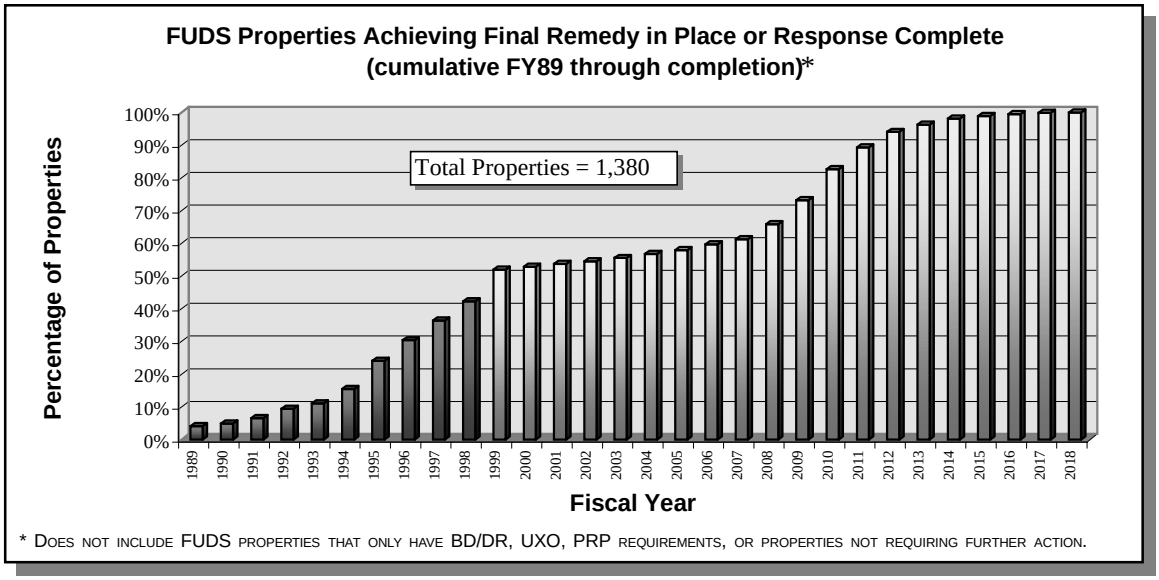
Relative Risk Implementation

New projects are continually being added to the FUDS program. USACE strives to evaluate as many projects as possible for relative risk to human health and the environment. As of the end of FY98, 26 percent of the 892 eligible HTRW projects no longer required relative risk evaluation because they had achieved Response Complete or Remedy in Place status. Another 41 percent of eligible HTRW projects had relative risk ratings. The remaining 33 percent of these projects, which are ready for site inspection, require future funding for data collection and relative risk evaluation. For CON / HTRW projects, removal of abandoned underground storage tanks has proved to be the most appropriate and cost-effective response. Thus, when funding becomes available, USACE will pursue removal responses at these sites instead of conducting expensive field sampling for relative risk evaluation. USACE has completed response actions for 51 percent of the 1,217 eligible CON / HTRW projects. Another 23 percent of the eligible CON / HTRW projects have removal responses under way. The remaining 26 percent of CON / HTRW sites require future funding for necessary removal responses.

Relative Risk Ranking for FUDS in Progress



USACE also is required to evaluate OEW projects for relative risk to human safety. OEW risk assessment is composed of hazard severity assessment and hazard probability assessment. Both are based on the best available information from record searches, reports of explosive ordnance disposal teams, field observations, interviews, and actual measurements. Of the 1,471 eligible OEW projects in the FUDS program, 578 have reached Response Complete status and therefore no longer require relative risk assessment. Relative risk assessment codes have been assigned for the remaining 893 OEW projects to indicate their potential impact on human safety.



Ratings of relative risk to human health, human safety, and the environment for HTRW and OEW projects have been used, along with other risk management factors, to aid in sequencing work during FUDS planning, programming, budgeting, and project execution.

Information and Technology Transfer

USACE works closely with the Army and other federal agencies to transfer information and innovative technologies within the environmental community. Innovative technology advocates (ITAs) have been established across the nation to promote such innovative technology transfer and use. The USACE ITAs are actively involved with the Interstate Technology and Regulatory Cooperation (ITRC) Workgroup, which assists state regulators and federal agencies in use of innovative technologies, technical protocols, and regulatory information. In addition, USACE is a primary member of the Web site development subgroup of the Federal Remediation Technologies Roundtable. This group is developing a Web site that will allow access to more than 140 completed case studies, including information on media and contaminant types and technologies used; provide links to other federal Web sites for environmental guidance and policy; and provide a matrix of field sampling and analysis technologies.

USACE is also using innovative technologies in the field to reduce the cost of environmental restoration on more than 225 projects, including those at FUDS. Two FUDS properties where innovative technology is playing a major role are the Naval Ammunition Depot in Hastings, Nebraska, and former Camp McCain in Mississippi.

Outreach

Public involvement is vital to the FUDS program's success. In FY98, USACE continued to work to expand its community relations efforts, ensuring that the public was made aware of the FUDS program and of the opportunities to participate in the cleanup process.

Although every effort is being made to establish Restoration Advisory Boards (RABs) at projects where there is sustained community interest, USACE recognizes that not all properties or projects lend themselves to RAB establishment. Nonetheless, some kind of community involvement and public outreach is required, and FUDS project managers and public affairs specialists are using a wide variety of community involvement techniques to reach out.

During FY98, the FUDS RAB program was extended by the addition of the Technical Assistance for Public Participation (TAPP) program. This program provides community members of RABs and technical review committees (TRCs) with access to independent technical support through the use of government purchase orders. The TAPP program is designed to help community members understand scientific and engineering issues pertinent to environmental restoration activities.

To implement the FUDS TAPP effort, DoD trained 25 district and division FUDS coordinators as trainers to disseminate the program information. The program's execution and benefits are illustrated by the TAPP contract awarded at the former Lowry Bombing and Gunnery Range. Among the tasks included in this contract (which was awarded in March 1998) were reviewing the Engineering Evaluation and Cost Analysis and other documents for the property; attending RAB meetings; and conducting presentations. The contract was essential in obtaining community acceptance of the USACE's procedures and the methodology for investigating and cleaning up the site. The community has been pleased with the results and wishes to continue these services in FY99.

The FUDS program now has 26 active RABs and 2 active TRCs for a total of 37 FUDS properties. No RABs were disbanded in FY98 and five RABs were established, although a few of these had already existed as TRCs before being converted to RABs.

An example of the FUDS program's RAB successes is the work of the former Nebraska Ordnance Plant's RAB. Public participation has been critical to the successful completion of the cleanup at this site. An aspect of the project that heightened the need for community involvement and trust was the construction and use of an on-site incinerator as part of remediation efforts. Because of public concern about this incinerator, a number of public events—beyond what is required by the Comprehensive Environmental Response, Compensation and Liability Act—were held at the site. The site's RAB,

Cleanup Program in Action:
Former Naval Ammunition Depot Experience

USACE, Kansas City District, was recently honored by the State of Nebraska for its innovative methods of cleaning up a formerly used Naval Ammunition Depot in Hastings, Nebraska. Contaminants at the site include volatile organic compounds from solvents, primarily trichloroethene (TCE), and TNT from explosives. Innovative techniques used on this project included horizontal air sparging, soil vapor extraction, in situ bioremediation, and recirculation. The work required cleanup of soil and water contamination at the property.

The district's decision to take a hard look at how it could get the job done in the best way possible led to the innovative techniques used at this site. Cleanup techniques used at the site were initially implemented as small-scale pilot studies and later put into full-scale application.

Use of these new techniques instead of the less efficient, traditional cleanup methods would not have been possible without the understanding and cooperation of the local citizens. This informed support was developed through the cooperation of the U.S. Environmental Protection Agency, the state, and local officials; implementation of RABs; and numerous public meetings. In addition, on October 9, 1998, agencies involved in the cleanup demonstrated to area junior high school students the techniques that environmental officials are using to clean groundwater at the site. Project consultant, Woodward-Clyde of Overland Park, Kansas, demonstrated the four contamination removal techniques. Other participants included the Little Blue Natural Resources District and the Nebraska Department of Environmental Quality (NDEQ).

USACE, Kansas City, has shared its cleanup ideas with local businesses, the state, and the engineering community so that the new methods can be used more widely. Locally, the City of Hastings and several businesses have become involved in the innovative technology efforts at Hastings subsites. Nationally, Nebraska's Governor Nelson has been a strong voice in support of innovative technologies, working through such organizations as the Western and the National Governors' Associations.

The techniques employed at the Hastings site have received several awards from the federal government and the professional engineering community. Several local businesses involved in the cleanup have also been honored. In addition, NDEQ recognized USACE, Kansas City, for its work at the site, presenting the district with its Environmental Excellence award "for the successful implementation of several innovative treatment technologies [at the Hastings site] to restore the environment in Nebraska."

which formed in FY97, received a tour of the incinerator during construction and was kept informed about project status. Public sessions were held in conjunction with the quarterly RAB meetings to allow community members to ask questions about all aspects of the project. In addition, risk assessment issues were presented and explained at several public meetings. Within 2 weeks of the incinerator's "trial burn," the results were summarized and presented to the public. This open presentation of the actual data alleviated many of the concerns of community members. By the end of the project, public trust was high and concern about any potential risk from the incinerator was very low. As a result, USACE was able to minimize down-time costs for the incinerator, and regulators were able to quickly review and approve steps to minimize the incinerator's presence on the site. An added benefit was that public participation in

Cleanup Program in Action:
Former Camp McCain Experience

The cleanup at the former Camp McCain illustrates how efficient use of available resources and technology, combined with implementation of new technology, can enhance the quality of work at ordnance-contaminated sites. The project's draft Engineering Evaluation and Cost Analysis is expected to be completed, ahead of schedule, before the end of the 1998 calendar year. Project costs are $100,000 under budget. In addition, the successful use of promising new technology may yield benefits for other Defense cleanup efforts.

Camp McCain is typical of many of the ordnance sites across the United States. During World War II, it comprised 42,074 acres and supported a wide variety of troop training activities. At its peak, the camp consisted of training, firing, and impact ranges; maneuver areas; and a troop housing and containment area. Today approximately 14,000 acres are used by the Mississippi National Guard; 29,000 acres are privately owned.

To determine the extent of ordnance contamination at the site and to develop and recommend risk reduction alternatives, USACE performed an Engineering Evaluation and Cost Analysis. Geophysical data collection was a key element of the study. Seven former bombing and gunnery ranges, comprising approximately 7,300 acres, were characterized.

USACE's and the contractor's experience with geophysical data collection (i.e., surveys) led to the selection of two types of detection equipment: electromagnetic and magnetic. The eletromagnetic EM-61 time-domain metal detector was used in relatively level, open areas; the magnetic 858 magnetometer was used primarily in wooded areas and on hillsides. Surveys were performed in area grids. To estimate the minimum number and approximate locations of grids for characterization of each sector, USACE used the SiteStats statistical package. Approximately 43 of the 7,300 acres were surveyed.

Three quality assurance checks ensured that the data were collected accurately and properly. Crews checked the data logger to ensure that data were collected; then again to ensure that the data were downloaded into a computer. The last and most important check was the contractors' performance of intrusive investigations to validate interpretation of the geophysical data.

The main objective of the intrusive investigation was to safely and efficiently excavate, identify, document, and remove ordnance. The excavations also established baseline readings for the ordnance-locating instruments to further validate the effectiveness of the technologies used and to identify which technologies work best. This check validated the accuracy with which the selected equipment distinguished between ordnance and nonordnance items.

No unexploded ordnance items were found during the excavations; however fragments of ordnance items were recovered at 71 of the 176 nonresidential grids and 29 of the 40 residential grids.

Schonstedt magnetometers were also used at the site to reacquire the anomalies identified, and the traditional "mag and flag" method was used for surveying 2.3 acres in a residential area. Unlike the other technologies used at the site, the Schonstedt magnetometer is not capable of classifying anomalies; however, all anomalies, to a depth of 4 feet, were excavated.

Promising new technology also was used to sample an additional area. A combination of the 858 magnetometer and the Global Positioning System (GPS) enabled USACE to conduct a geophysical survey without establishing grids. This technology shows promise, based on the data collected, because it allows quick, accurate geophysical and positional data collection for a large area.

Selecting the best technology and performing a cost-efficient, validated study are crucial to developing and recommending the best risk reduction methods. But the success of Camp McCain should be measured not only in these site-specific terms, but also in terms of the project's value for future ordnance investigations.

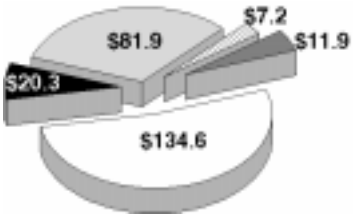
the project enhanced the community's trust in the USACE and other agencies in general. From the beginning of construction to the completion of operations, more than 16,000 tons of contaminated soil was treated.

Funding

Since the devolvement of Defense Environmental Restoration Account funds, funds for DERP cleanup efforts have been distributed into five separate accounts, including one for FUDS. Congress recognized the importance of the FUDS program and appropriated a budget increase of $40 million for the FUDS program in FY98.

FUDS Environmental Restoration Funding Profile
(in millions of dollars)

FY97 FUDS Funds Executed

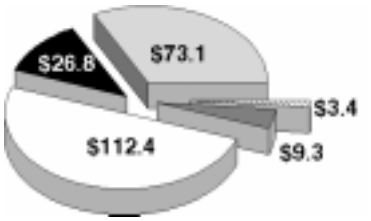


Total = $255.9 million

FY98 FUDS Funds Obligated

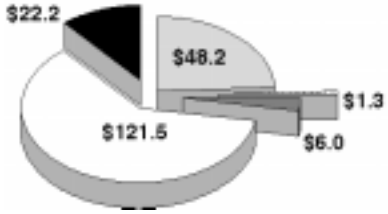
Total = $242.3 million

FY99 FUDS Execution Planned



Total = $225.0 million

FY00 FUDS Planning Estimate



Total = $199.2 million