FY00 Status and Progress

The considerable size of the Defense Environmental Restoration Program (DERP)—in terms of number of sites, dollars, and years to complete—demands extensive resources, comprehensive planning, and hard work. To keep this large program on track and measure its progress, the Department of Defense (DoD) developed program performance goals for its installations and properties. These program goals focus on getting remedies in place and completing needed cleanup requirements at sites. DoD also has established performance metrics called measures of merit to assess progress in meeting these cleanup program goals. Each year, the Department uses these measures to make sure it is on track in relative-risk reduction, phase progress, remedy in place (RIP) and response complete (RC) progress, and making sites at Base Realignment and Closure (BRAC) property environmentally suitable for transfer.

DoD has established cleanup goals and set measures of merit to assess progress toward these goals.

DoD sets RIP/RC goals for its sites at active installations and Formerly Used Defense Sites (FUDS) properties according to site relative-risk categories, DoD's system for prioritizing work and allocating restoration resources. These categories are discussed in detail later in this chapter. In general, DoD aims to have remedies in place or to achieve RC status at—

- 50 percent of high relative-risk sites by end of Fiscal Year 2002 (FY02)
- All high relative-risk sites by end of FY07
- All medium relative-risk sites by end of FY11
- All low relative-risk sites by end of FY14.

DoD focuses on putting remedies in place and achieving response complete at sites.

As of the end of FY00, the Department had reduced the total number of high relative-risk sites at active installations by 41 percent and, in aggregate, expects to surpass its FY02 goal. FUDS, however, will have difficulty in meeting its goals without an increase in funding.

In fulfilling its cleanup obligations at BRAC installations, DoD considers the planned reuses either within the Department or by other parties. For this reason, BRAC installation goals are different from those at active installations. At these closing and realigning installations, DoD is working to achieve RIP or RC at—

- 90 percent of BRAC sites by end of FY01
- 75 percent of BRAC installations by end of FY01
- 100 percent of BRAC installations by end of FY05.

DoD classifies BRAC property in seven categories to describe the property's environmental condition. Acreage in Categories 1 through 4 is suitable for transfer under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Acreage in Categories 5 through 7 requires some cleanup or evaluation. DoD aims to make 75 percent of the property in Categories 5 through 7 suitable for transfer by FY01 and 100 percent by FY05. Additional information on BRAC acreage is provided in Appendix D.

GOOD NEWS From the Field:

Schofield Barracks Bids NPL Aloha

At Schofield Barracks on the island of Oahu, Hawaii, the Army has shown how its environmental restoration program can be navigated effectively and efficiently through a combination of innovation, cooperation, and common sense. On August 10, 2000, the U.S. Environmental Protection Agency (EPA) removed Schofield Barracks from the National Priorities List (NPL), making it the first entire Army installation, the third full DoD installation, and only the fifth complete federal facility to be removed from the NPL.

Schofield Barracks used packed aeration towers for TCE removal.

Schofield Barracks was placed on the NPL in September 1990 due to tricholorethene (TCE) contamination in the drinking water supply. In September 1998, just 8 years after its NPL listing and only 7 years after initial investigations began, the Army attained EPA's Construction Complete milestone, signifying completion of all of its Records of Decision and cleanup construction activities. Attainment of this milestone was followed by this year's delisting from the NPL.

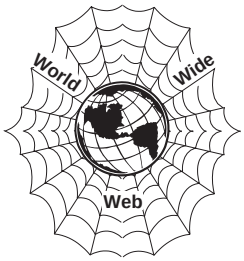
The Army's unique cleanup approaches at Schofield Barracks, such as wellhead treatment of groundwater and use of an on-site screening laboratory, an EPA presumptive remedy for landfills, and innovative technologies for optimizing use of groundwater data, resulted in an avoidance of approximately $15 million in investigation costs and more than $100 million in cleanup costs.

Navigating the Cleanup Process

DoD installations are similar to small towns or counties, often stretching for hundreds or thousands of square acres. Installations may contain office buildings, training areas, runways or depots, housing areas, and forests or prairies. Generally, most of the land on an installation is clean, with discrete areas of contamination distributed across the landscape. DoD calls these areas of contamination "sites" and organizes its cleanup program on a site-by-site basis. The FUDS program refers to its sites as "projects."

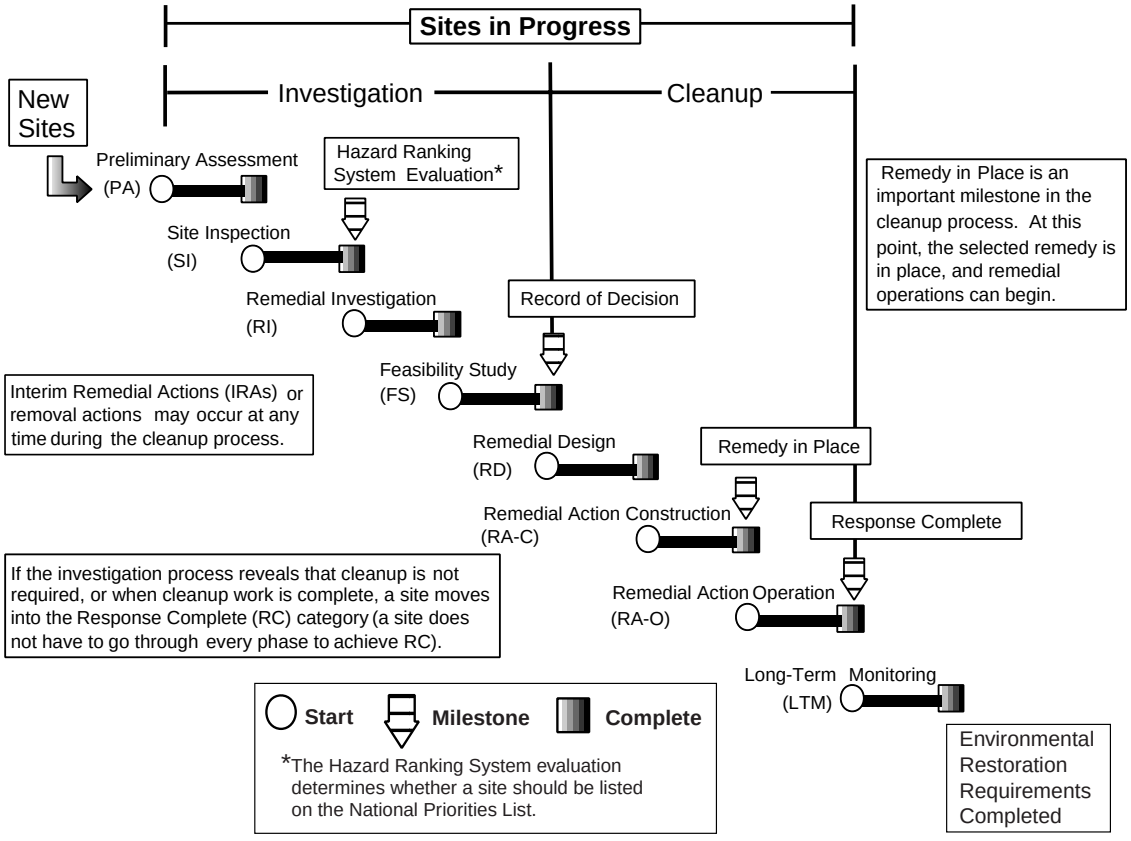
CERCLA is the primary legal authority governing cleanup activities at DoD installations and FUDS properties. All DoD installations and FUDS properties follow requirements consistent with CERCLA. The CERCLA response process consists of several phases, as illustrated in Figure 4. Although some of these phases may overlap, DoD generally conducts activities in this order when cleaning up a site.

CERCLA



http://www.denix.osd.mil/denix/Public/Policy/env-law-index.html

Figure 4
Restoration Process Phases and Milestones



Finding the Way with Investigation

Sometimes DoD studies determine that sites do not require any cleanup activities.

When a new site is discovered, it enters the investigation stage of the process, which consists of several phases. DoD first performs a preliminary assessment (PA), an investigation of limited scope to determine whether contamination may be present. The PA typically includes searches of installation records, visual site inspections, and interviews with installation or property personnel. The next phase, the site inspection (SI), involves collecting additional data to help DoD decide whether to pursue further environmental restoration activities or discontinue investigation (if it is determined that the site requires no additional assessment).

The remedial investigation (RI) and feasibility study (FS) phases follow the PA/SI. During the RI, DoD takes samples of soil and groundwater and analyzes the results to determine whether contamination is present. DoD evaluates various cleanup options and determines the best strategy during the FS. After the FS is complete, DoD documents the investigation activities and the selected cleanup option in a Record of Decision (ROD), or an equivalent document. At sites that pose no risk to human health or the environment, the ROD may document no further action.

Staying the Course in Cleanup

Remedy in Place and Response Complete are important DoD milestones.

Sites that require additional action continue to the cleanup phases of the environmental restoration process, which include remedial design (RD), remedial action construction (RA-C), and remedial action operation (RA-O). During these phases, DoD designs the selected remedy, constructs the remedy based on the RD specifications, and puts the remedy (for example, a pump-and-treatment system for groundwater) into operation. Operation of the remedy then continues until the site's cleanup objectives, as specified in the ROD, have been met.

DoD has established two primary milestones to mark program progress. The remedy in place milestone is the point at which DoD has finished constructing the remedy and the remedy is operating effectively. The second milestone, response complete, is reached when all cleanup objectives specified in the decision document have been met.

During RA-O, some sites may require 5-year reviews to ensure that the remedy is functioning as designed and that necessary operation and maintenance activities are being conducted. After a site reaches the RC milestone, DoD may conduct long-term monitoring (LTM) activities to

GOOD NEWS
From the Field:

Successful Cleanup Readies Naval Air Facility Adak for Transfer

The Loran Station UST was just one of the USTs removed from Operable Unit A.

Cleanup work by the U.S. Navy has gone a long way toward preparing Naval Air Facility (NAF) Adak Island for transfer. Successful cleanup of chemical contamination and ongoing remediation at petroleum-impacted sites are bringing the Navy closer to its ultimate goal of transferring NAF Adak, in Alaska's Aleutian Islands, to the Aleut Corporation, one of 13 corporations established under the terms of the Alaska Native Claims Settlement Act to manage lands for its tribal members.

Environmental problems at this facility are the result of military operations conducted there since World War II. These operations contaminated some areas of the island with hazardous substances. In view of this contamination, the U.S. EPA placed NAF Adak on the National Priorities List in 1994. Under the Base Closure and Realignment Act, the military mission of NAF Adak ended in 1997. Since then, the Navy has conducted environmental restoration and closure activities on and near the facility, which will lead eventually to the lease and transfer of the property.

The Navy's Engineering Field Activity, Northwest (EFA, NW) in Washington State provides oversight and funding for cleanup at NAF Adak, while EPA and the Alaska Department of Environmental Conservation oversee on-site investigation and cleanup. The Adak Reuse Corporation, the area's local redevelopment authority, has responsibility for planning future uses for the island. In addition, a Restoration Advisory Board (RAB) was formed as a link between the community and the cleanup team. Members of the RAB come from the local Adak community, EPA, and EFA, NW.

The areas of contamination on Adak are designated as Operable Unit (OU) A. This unit comprises 58 sites with chemical contamination and 128 sites with petroleum contamination. Cleanup work for the 58 chemically contaminated sites is complete, except for establishment of land use controls. These include fencing, signs, groundwater monitoring, landfill caps, deed restrictions, and educational programs for the community.

The Navy has also completed work on the 128 petroleum-contaminated sites in OU A and is now shifting its focus to long-term monitoring. Completed petroleum cleanup projects include the removal of leaking or potentially leaking oil-containing underground storage tanks (USTs). The Navy successfully closed other USTs in-place by filling them with sand. In some cases, the Navy conducted UST and soil removals; in others, the Navy installed petroleum product recovery systems. So far, these systems have recovered nearly 200,000 gallons of fuel.

verify that the remedy remains effective. At every site, DoD's goal is to fulfill environmental restoration program requirements and ensure that human health and the environment are protected.

Restoring the Environment Measure by Measure

Reviewing phase progress—that is, the number of sites that are undergoing investigations or cleanups or have reached RC—is one tool DoD uses to determine how well the environmental restoration process is progressing. An increase in the number of sites moving from investigation to cleanup to RC indicates program progress. The overarching program goal is for each site to move through the appropriate environmental restoration phases and complete all cleanup requirements.

Figures 5, 6, and 7 show the status of all DERP sites at active and BRAC installations and FUDS properties. Each site is classified as undergoing investigation or cleanup (in-progress), awaiting future work, or achieving response complete. DoD often conducts LTM at sites that have reached RC to ensure that the remedy remains effective. As Figures 5, 6, and 7 show, DoD has achieved RC at 70 percent of active sites, 60 percent of BRAC sites, and 52 percent of FUDS projects as of September 30, 2000. Overall, DoD has reached the RC milestone at 66 percent of DERP sites, an increase from less than 64 percent in FY99.

Figure 5
Active Installations Overall Site Status
(as of September 30, 2000)

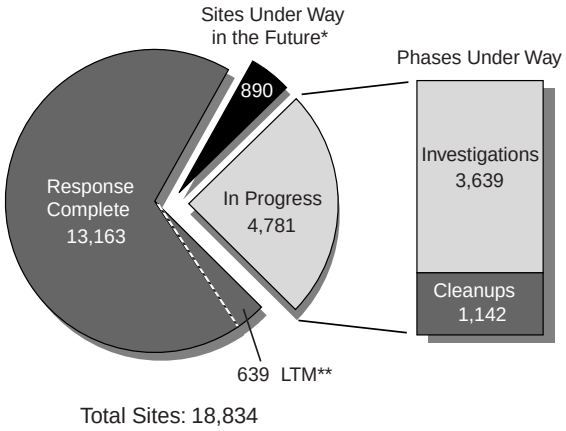
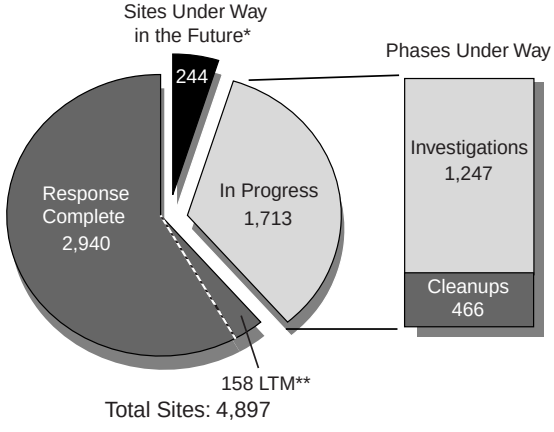


Figure 6
BRAC Installations Overall Site Status
(as of September 30, 2000)

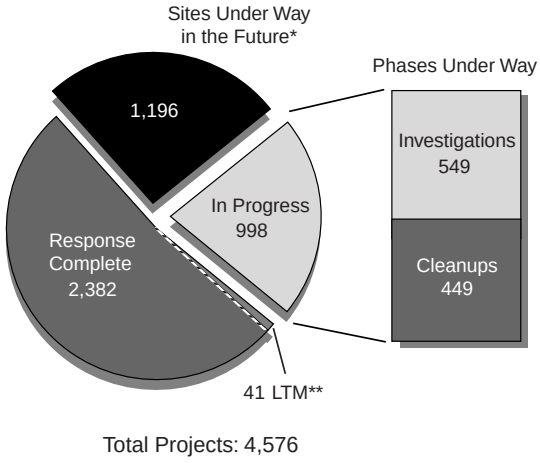


*Includes sites with future preliminary assessment starts planned and sites that are between phases.
**LTM is a subset of Response Complete.

DoD has made significant, continual progress in reaching RC. During FY00, DoD achieved RC at an additional 1,178 sites and projects, indicating a continuing commitment to fulfilling its environmental restoration goals. Based on the results of investigation activities, DoD often finds that sites do not pose a risk, and thus do not require remedial actions. As shown in Figures 8 and 9, at the end of FY00, 79 percent of the active installation sites and FUDS projects and 74 percent of the BRAC sites reached the RC milestone directly from investigation rather than through the cleanup process.

Removal actions and interim remedial actions (collectively called interim actions) are important ways to mitigate immediate risks to human health and the environment in the environmental restoration process. Generally, these actions are short-term measures and can be implemented in both the Investigation and the Cleanup stages. Removing leaking barrels to remove a source of contamination or installing fencing around a property to prevent a pathway are examples of interim actions. By the end of FY00, DoD had conducted 4,572 interim actions to address

Figure 7
FUDS Projects Overall Status
(as of September 30, 2000)



Total Projects: 4,576

*Includes projects with future preliminary assessment starts planned and cleanup projects that are between phases.
**LTM is a subset of Response Complete.

Figure 8
Active Sites and FUDS Projects with Response Complete*

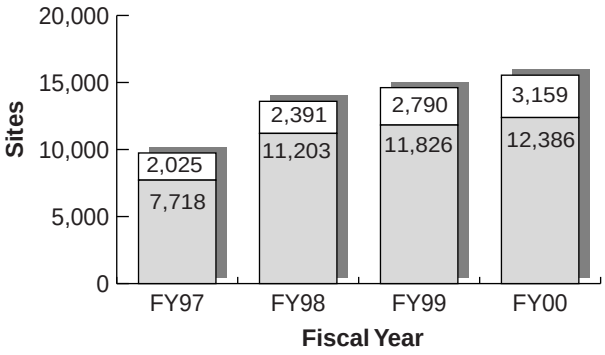
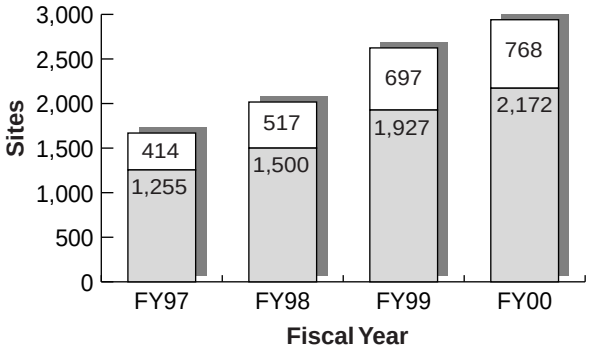


Figure 9
BRAC Sites with Response Complete*



Sites reaching Response Complete from Cleanup
Sites reaching Response Complete directly from Investigation

*FY97 through FY99 totals have been updated since the previous Annual Report to reflect new and revised data as of FY00.

immediate risks. This total includes 3,048 interim actions at active installation sites, 1,376 at BRAC installation sites, and 152 at FUDS projects. In some cases an interim action will eliminate or sufficiently reduce risk to human health or the environment so that remedial action is not needed. If studies show that this is the case, DoD may select the interim action as the final remedy. Figures 10 and 11 show the DERP's cumulative completed interim actions through FY97, FY98, FY99, and FY00.

Cleanup success begins at the site level; however, DoD's broader goal is to reach its cleanup milestones at all sites or projects on an installation or property. A DoD installation or FUDS property achieves RIP or RC status when every site or project has all remedies in place or has reached RC. Figures 12, 13, and 14 show the progress DoD has made toward this goal through FY00, as well as projections of when all installations and FUDS properties will reach RIP or RC. By the end of FY00, DoD had achieved RIP or RC at 69 percent of active installations, almost 49 percent of BRAC installations, and 50 percent of FUDS properties. DoD anticipates that it will achieve RIP or RC at all of its installations by 2015.

Figure 10
Cumulative Interim Actions
Completed at Active Sites and FUDS Projects*

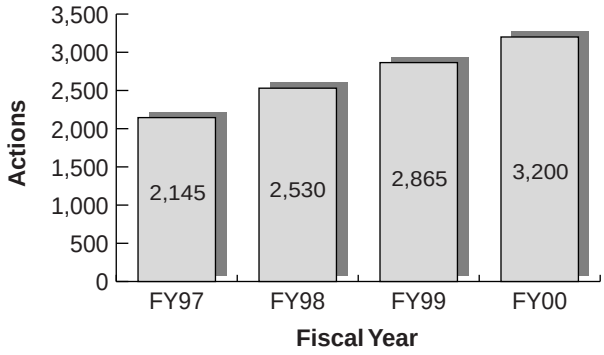
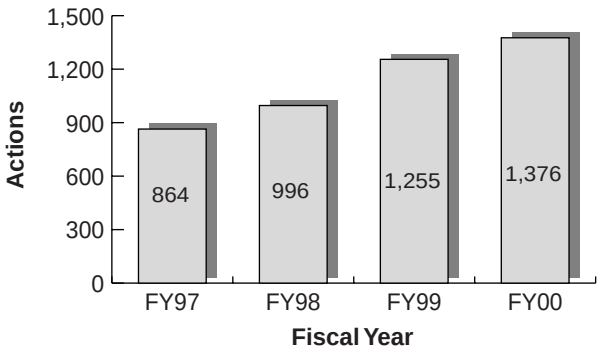


Figure 11
Cumulative Interim Actions
Completed at BRAC Sites*



*FY97 through FY99 totals have been updated since the previous Annual Report to reflect new and revised data as of FY00.

Figure 12
DoD Active Installations Achieving Final Remedy in Place or Response Complete
(cumulative and projected, FY90 through completion)

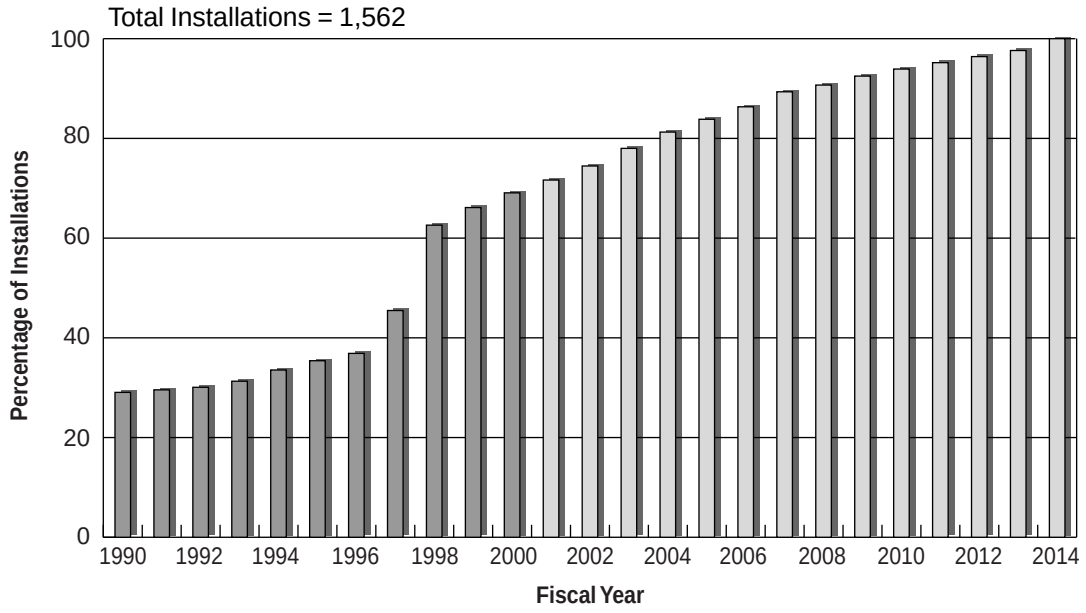
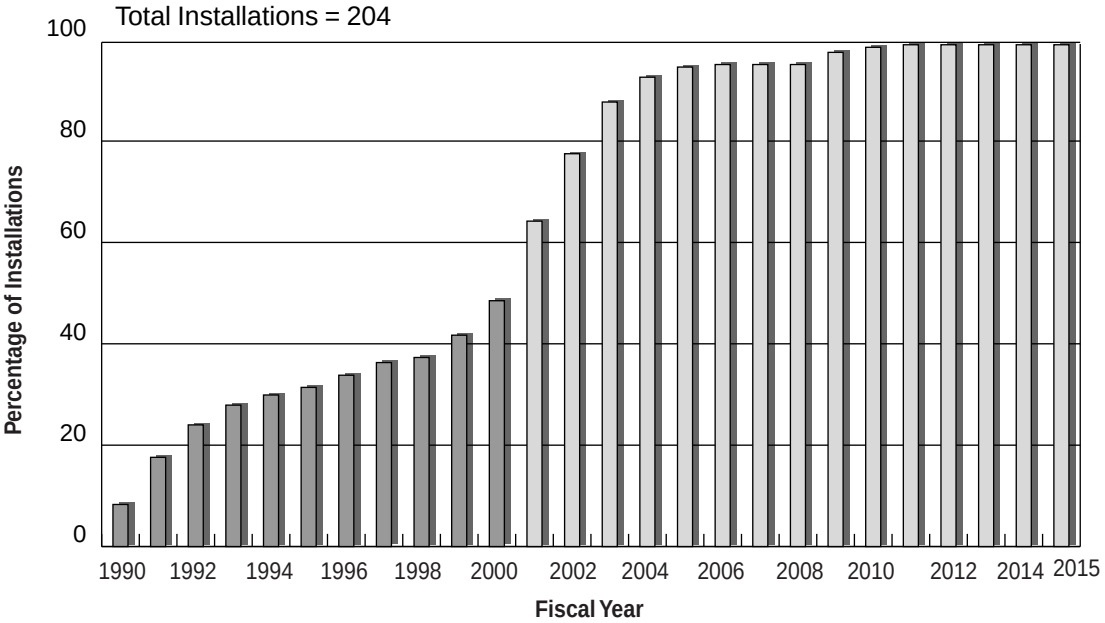
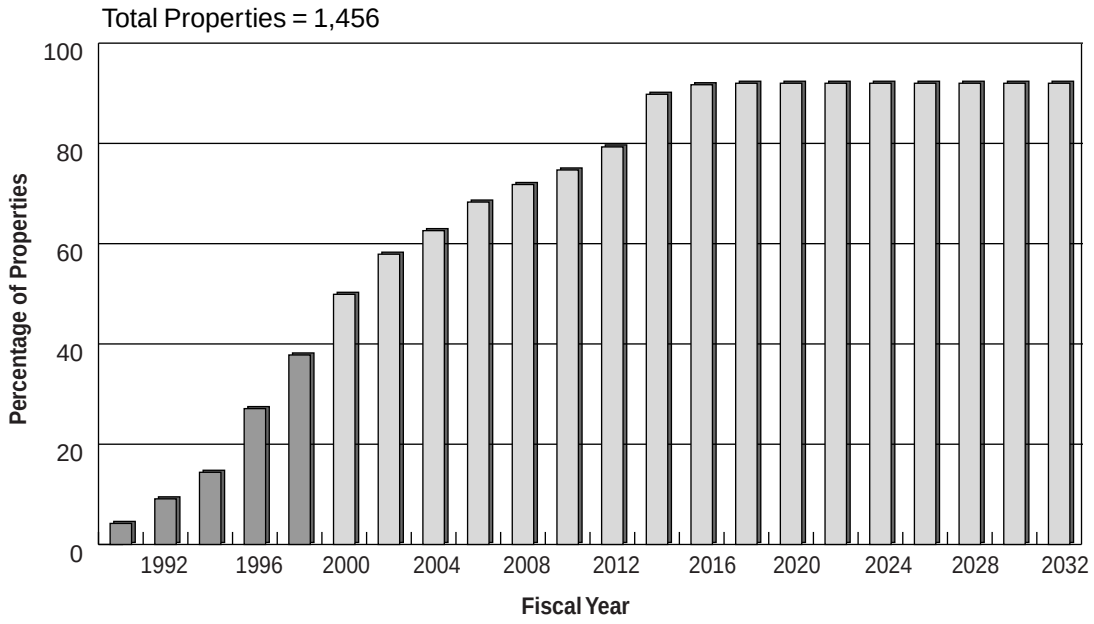


Figure 13
BRAC Installations Achieving Final Remedy in Place or Response Complete*
(cumulative and projected, FY90 through completion)



*Does not include three Army installations that have only unexploded ordnance and two Air Force installations that have no Installation Restoration Program sites.

Figure 14
FUDS Properties Achieving Final Remedy in Place or Response Complete*
(cumulative and projected, FY90 through completion)



*This graph does not show FUDS properties as reaching 100 percent RIP or RC because completion dates have not been determined for some properties. This graph does not include ordnance and explosives waste, building demolition and debris removal, potentially responsible party, or No DoD Action Indicated properties or projects.

GOOD NEWS From the Field:

Tobyhanna Army Depot Achieves Construction Complete Status

In FY00, Tobyhanna Army Depot, Pennsylvania, became the first federal facility in U.S. EPA Region 3 to achieve Construction Complete status. This means that all required restoration work has been completed. Construction Complete is an EPA milestone in its cleanup process. The success was due to the excellent partnering efforts of Army, EPA Region 3, and the Pennsylvania Department of Environmental Protection. Personnel from these three groups jointly wrote the environmental restoration documents.

EPA Region 3 will now petition EPA Headquarters to remove 62 of the 65 sites at Tobyhanna from the NPL. Groundwater on the three remaining sites is being remediated through monitored natural attenuation, and these sites will remain on the NPL until the groundwater meets established cleanup levels.

In 1994, the cost estimate for the cleanup of sites at Tobyhanna was $33 million. Through partnering and innovative techniques, Tobyhanna now projects that total costs will be $16 million, avoiding $17 million in costs for scheduled remedial activities. Of the $16 million projected cost, Army has used $12 million for investigations and operations to date. The remaining $4 million will be used for groundwater sampling and analysis for the monitored natural attenuation remedy.

GOOD NEWS From the Field:

DRMS Completes Remedial Action at Summit Equipment and Supply Superfund Site

Contractors work on final remediation of contaminated soil at the Summit Equipment and Supply hazardous waste site.

In November 2000, the Defense Reutilization and Marketing Service (DRMS), part of the Defense Logistics Agency, completed its cleanup of contaminated soil at the Summit Equipment and Supply Superfund site in Akron, Ohio.

This 6-acre facility originally processed iron and scrap metal for salvage. In 1987, U.S. EPA Region 5 began an emergency response action at the site to address soil contamination, including polychlorinated biphenyls (PCBs), heavy metals, asbestos, unexploded ordnance (UXO), a concrete vault containing barium chloride, a cylinder suspected of containing low-level radioactive material, and groundwater contaminated with volatile organic compounds and hexavalent chromium.

Identified as a potentially responsible party in 1991, DRMS entered an agreement with EPA requiring DRMS to conduct the investigation and cleanup at the site. EPA determined that the best option for cleaning up the contaminated soil was excavation and off-site disposal. All UXO had to be removed to a depth of at least 1 foot. For groundwater, monitored natural attenuation was the preferred cleanup method. During the cleanup, contractors removed and shipped off-site almost 2,800 truckloads of contaminated soil. Over 400 pieces of UXO were found, 75 of which were suspected to be live (these were detonated at a local landfill).

Although soil contaminated with PCBs and lead normally requires incineration, DRMS and the U.S. Army Corps of Engineers (USACE), with EPA concurrence, successfully treated 8,814 tons of lead-contaminated soil in the ground by mixing lime into the soil. To treat the remaining lead-contaminated soil, DRMS and USACE used an innovative technology called maectite treatment, which chemically binds the lead. Using the lime and maectite methods with subsequent disposal of treated soil, instead of traditional incineration and disposal of untreated soil, enabled DRMS to avoid more than $7.5 million in costs.

DRMS saved an additional $3 million by not backfilling the excavated areas to the original grade. Not only did this decision save money, but the site's lower grade level was actually a better blend with the existing neighborhood soil. Once the site was graded for proper drainage, a layer of topsoil was added and the area seeded with grass.

DRMS and USACE will continue to monitor the groundwater on site for 30 years. Sampling already indicates that natural attenuation of contaminants is occurring. To improve the accuracy of sampling data, DRMS and USACE plan to replace the current sampling devices (low-technology bailers) on the groundwater monitoring wells with state-of-the-art, low-flow purge pumps. At the same time, to reduce long-term costs, DRMS and USACE plan to discuss with U.S. EPA and Ohio EPA the possibility of reducing sampling area parameters and the number of wells being sampled. DRMS and EPA are supplementing their remedial and monitoring efforts with appropriate land use controls, which will govern future site activities.

Prioritizing Cleanup to Plot the Course Ahead

DoD classifies sites as high, medium, or low relative risk.

DoD has one of the largest environmental restoration programs in the world, with over 28,000 sites across the nation and in U.S. territories. Because of the resources required, DoD cannot address all of its sites at the same time. For this reason, DoD developed the Relative-Risk Site Evaluation (RRSE) framework to ensure that sites in the DERP are addressed in a systematic and safe manner.

DoD focuses on worst sites first.

At each site, DoD evaluates the extent of contamination, the potential for the contamination to spread, and the potential for humans or the environment to be exposed to the contamination. After evaluating all of this information, DoD designates each site as high, medium, or low relative risk. The term *relative* risk is used because the risk posed by each site is determined as compared with that posed by the other sites within the program. DoD is striving to complete its work at all sites, but emphasizes addressing first, and focusing its resources on, those sites that pose the greatest relative risk. Other factors, such as risk assessments, regulatory status, program goals, stakeholder concerns, and economic matters, are also considered when prioritizing work.

In addition to the high, medium, and low relative-risk categories, RRSE includes two designations, Not Evaluated (NE) and relative-risk evaluation Not Required (NR). Sites in the NE category have not been investigated to an extent that allows DoD to determine their relative-risk ranking. DoD is working hard to reduce the number of sites in this category. The NR category includes sites that used to be in the high, medium, or low relative-risk categories but have now achieved RIP, RC, or No Further Action status. These sites no longer need to be assigned to risk categories because DoD has already committed to funding their RA-O and LTM requirements. Sites or projects with unexploded ordnance (UXO), building demolition and debris removal, or potentially responsible party requirements are also categorized as NR.

DoD also uses relative risk as a program management tool to track the progress of sites in the cleanup program. A reduction in the number of sites in each relative-risk category is an indicator that DoD is cleaning up sites and reducing risk.

Figures 15 and 16 show the number of sites in each relative-risk category from FY98 through FY00. DoD particularly focuses on reducing the number of sites in the high relative-risk category to ensure protection of human health and the environment. As mentioned at the beginning of this chapter, one of DoD's program goals is to reduce the number of high relative-risk sites by 50 percent by 2002 and by 100 percent by 2007. In FY00, DoD removed 132 active sites and FUDS projects and 75 BRAC sites from the high relative-risk category through environmental restoration activities. Additionally, DoD has reduced the number of sites ranked as medium or low relative risk or that have not been evaluated, and has increased the number of sites that no longer require a relative-risk designation.

DoD has significantly reduced the number of sites in the high relative-risk category.

Figure 15
Active Installation and FUDS Property
Relative-Risk Site Evaluation Progress

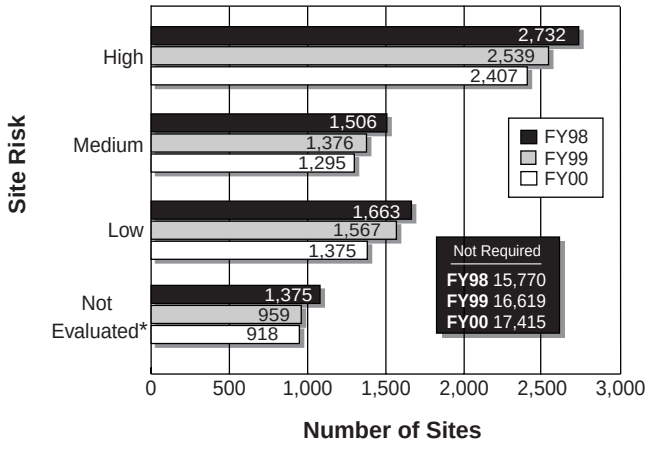
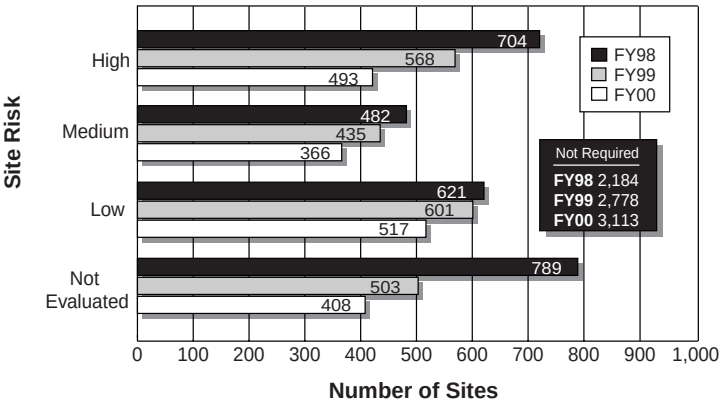


Figure 16
BRAC Installation
Relative-Risk Evaluation Progress

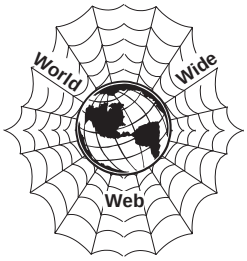


Sites that have RIP, RC, or No Further Action Required designations do not require relative-risk evaluation because DoD has committed to funding RA-O and LTM requirements at these sites. These sites are designated Not Required for relative-risk purposes.

* The Not Evaluated category includes a large number of FUDS projects that are exclusively associated with aboveground and underground storage tanks; these projects' need for Relative-Risk Site Evaluation will be determined after tank removal.

Funding Cleanup—Planning, Programming, Budgeting, and Execution

Guide to the DoD Environmental Security Budget



http://www.denix.osd.mil/denix/Public/Library/Envirsb/envirsb.html

Cleaning up one site requires accurate planning, funding, and execution of the plan. Cleaning up over 28,000 sites across the country requires careful coordination, prioritization, and tracking. Because funding for cleanup is limited, DoD must plan its activities years in advance to ensure that adequate funding is available and used most efficiently. Development of the overall DoD budget begins at the site level and builds to the Component level. DoD's ability to plan and conduct cleanup activities depends on receiving stable funding from year to year.

Funding for cleanup is influenced by many factors, including changing priorities in the cleanup process, identification of new sites, and, sometimes, changes in national security priorities. In addition to these considerations, each site's sequencing for cleanup is based on the factors used to determine its relative risk.

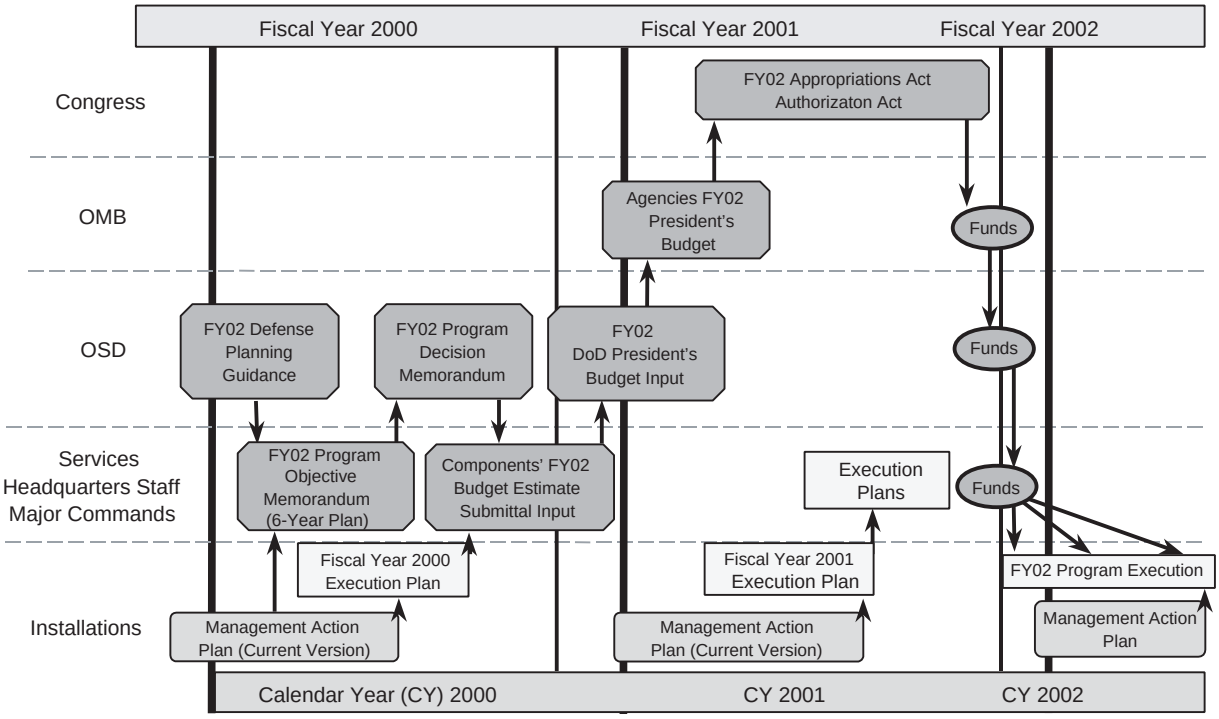
To ensure that the program progresses smoothly toward meeting its environmental restoration requirements and maintains continuity in changing circumstances, DoD must carefully and methodically plan its activities but also remain flexible and adapt to changes. Preparation for the cleanup process consists of four interrelated phases—planning, programming, budget development, and program execution. Figure 17 illustrates this complex process.

Planning at the Installation Level

DoD's program goals set requirements at the Component level for reducing relative risk, having remedies in place or achieving RC status, and making property at BRAC bases environmentally suitable for transfer. Each installation works toward the program goals by developing and maintaining a management action plan (MAP) or a BRAC cleanup plan (BCP) for managing its individual environmental restoration activities.

A MAP contains information about an active installation's past activities and current status, presents a vision for future site-level requirements, establishes schedules, and identifies funding requirements through site closure. The BCP is the equivalent planning document for installations undergoing transfer. Each installation updates its MAP or BCP at least once a year to reflect changes in priorities, additional cleanup information,

Figure 17
Cleanup Budget Process



policies, cleanup progress, and availability of funding. The best opportunity for stakeholder involvement and input is during this update process.

Programming at the Component Level

Components use the requirements identified in their installations' MAPs or BCPs to prepare long-range (5- to 6-year) plans called Program Objective Memorandums (POMs). The Office of the Secretary of Defense (OSD) reviews the POMs and then issues Program Decision Memorandums to the Components, if necessary, to help them prepare their budget estimate submittals.

Budgeting at the Top

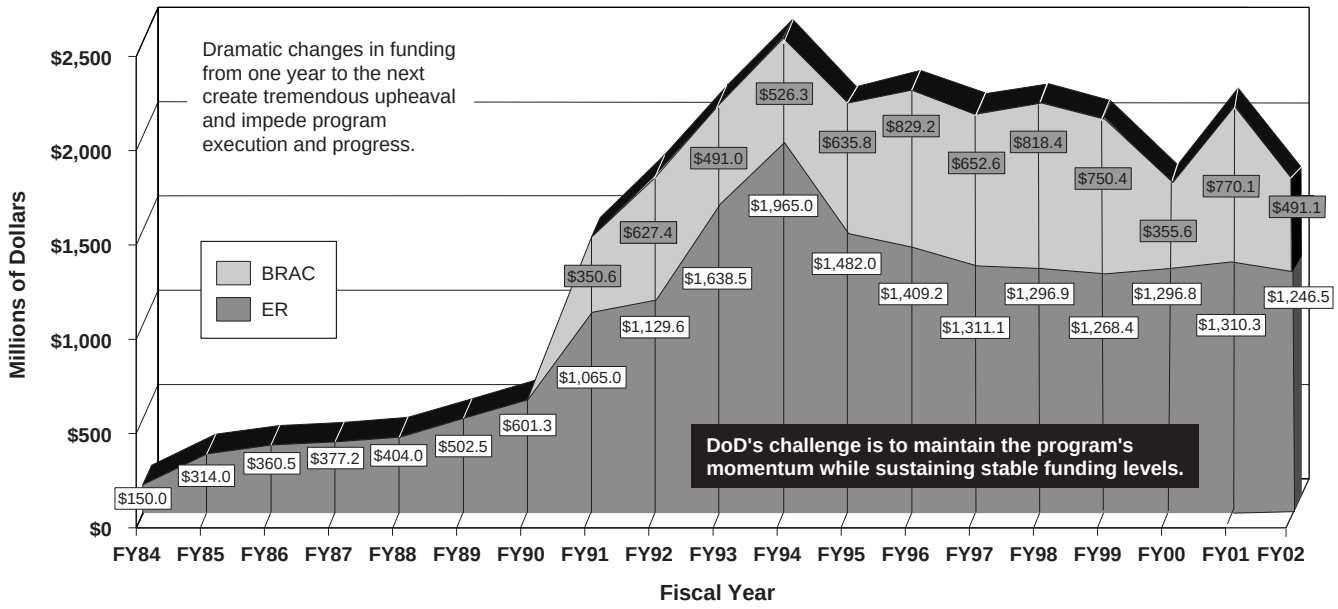
The Components develop and submit budget estimates to the Office of the Secretary of Defense for review and approval. Any issues are resolved during a rigorous 3- to 4-month review process. One of DoD's main concerns is making sure it can fulfill its Defense-wide requirements within

the budget targets set by the Office of Management and Budget. The Office of the Secretary of Defense, Cleanup believes it is critical that the Components receive adequate environmental restoration funding to meet their program goals.

Once the Office of the Secretary of Defense has received and approved the Components' budget estimates, it develops the overall Defense budget and submits it to the Office of Management and Budget for review and approval before forwarding the budget to the President for signature. The President submits the full budget to Congress early in the following calendar year. For a given fiscal year, Congress authorizes DoD's activities through the National Defense Authorization Act and provides funds through the National Defense Appropriations Act.

From FY84 through FY00, DoD spent over $22 billion on the DERP. In FY00 specifically, Congress appropriated $1,296.8 million for environmental restoration activities at active installations and FUDS properties, a slight increase over FY99 funding. Congress also appropriated well over $300 million for environmental activities at BRAC installations. DoD funds cleanup activities at these closing and realigning installations through the overall BRAC account, which Congress reauthorized in 2000. The BRAC account also covers closure-related environmental compliance and environmental planning activities. DoD is working expeditiously to make BRAC property environmentally suitable for transfer to other users. FY00 BRAC environmental restoration funding decreased significantly from FY99; however, estimated FY01 funding provides for the completion of projects begun in FY00 as well as funding FY01 projects. Congress also decreased FY01 BRAC funding by $150 million due to a perception of lagging expenditures of funds appropriated in prior years. Figure 18 shows DoD's funding through FY02. DoD depends on congressional support for predictable funding levels to accurately plan and estimate its future costs and activities, particularly as the DoD Components are striving to achieve their RIP and RC goals.

Figure 18
Environmental Restoration (ER) and BRAC Environmental Funding Trend
(in millions of dollars)

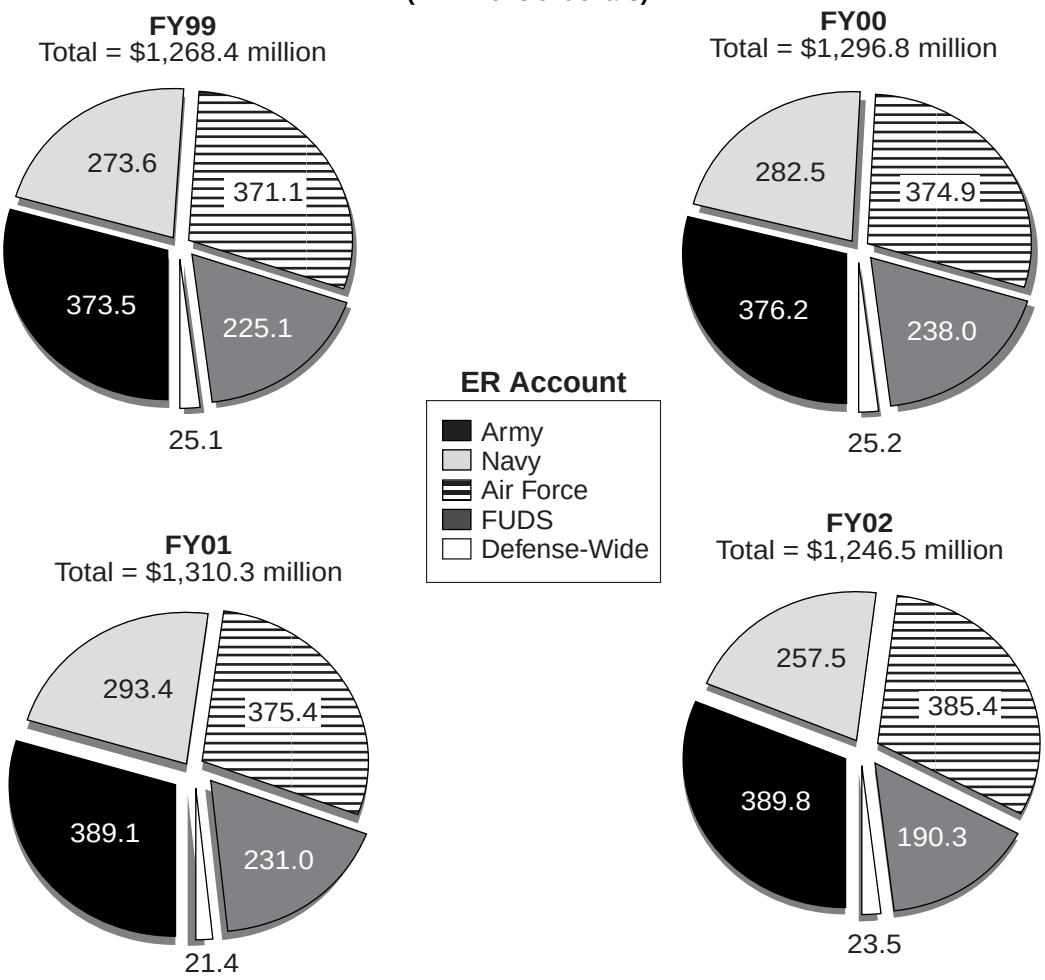


Executing the Program

After Congress approves the budget and appropriates the funding, DoD's environmental restoration funds for cleanup activities at active installations and FUDS properties are transferred to five accounts:

- Environmental Restoration (ER), Army
- Environmental Restoration, Navy
- Environmental Restoration, Air Force
- Environmental Restoration, FUDS
- Environmental Restoration, Defense-Wide (including the Defense Logistics Agency (DLA), the Defense Threat Reduction Agency (DTRA), and the Office of the Secretary of Defense, Cleanup).

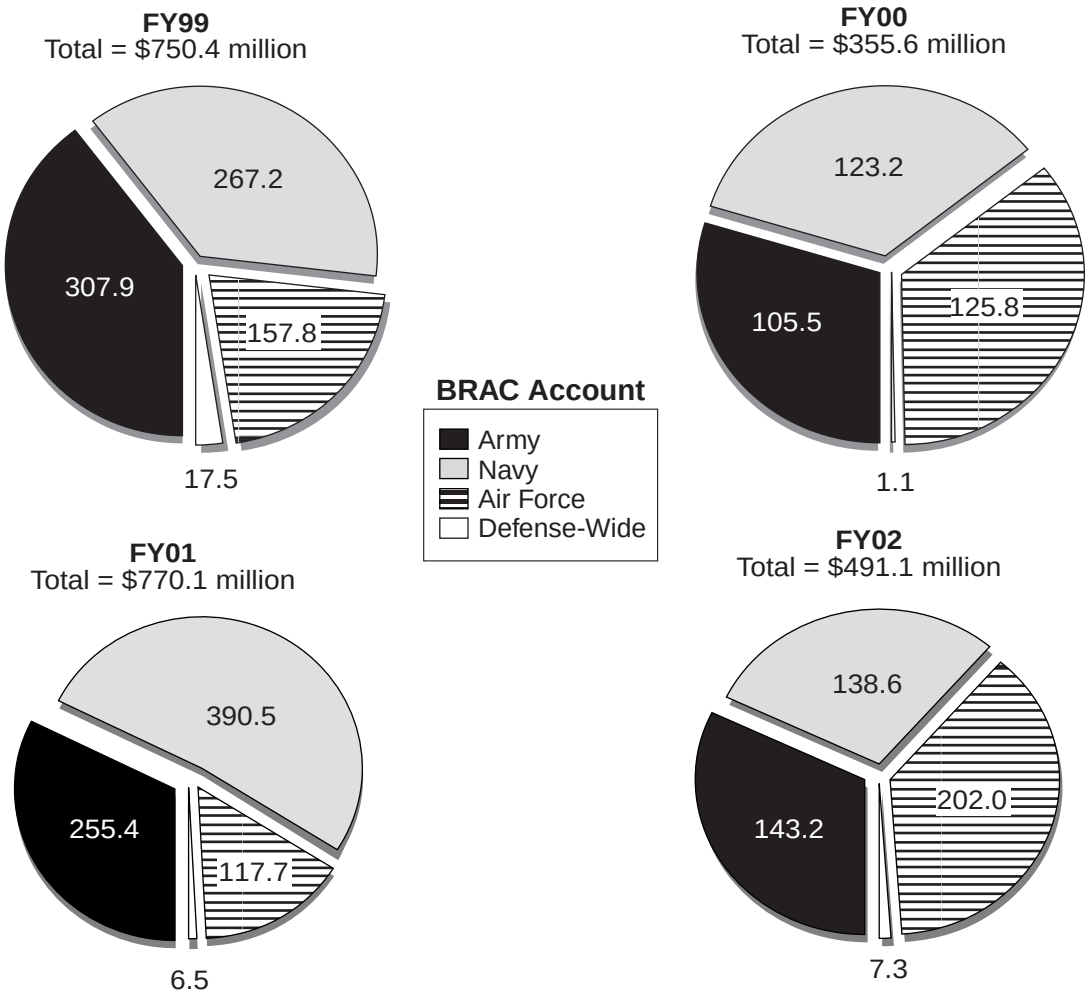
Figure 19
Environmental Restoration Funding Profile for DoD Program Oversight and Military Components*
(in millions of dollars)



*Due to rounding, Component subtotals may not equal FY totals.

Figure 19 shows actual and estimated FY99, FY00, FY01, and FY02 DoD funding, per Component, for environmental restoration activities at active installations and FUDS properties. For FY00, Congress appropriated $376.2 million for Army, $282.5 million for Navy, $374.9 million for Air Force, $238.0 million for FUDS, and $25.2 million for DLA, DTRA, and OSD oversight. The Components are responsible for allocating funds to their major commands and installations for executing the program.

Figure 20
BRAC Environmental Restoration Funding Profile for DoD Program Oversight and Military Components*
(in millions of dollars)



*Due to rounding, Component subtotals may not equal FY totals.

Figure 20 presents the FY99 through FY02 funding profiles for environmental restoration activities at BRAC installations. For FY00, Congress made available $105.5 million for Army, $123.2 million for Navy, $125.8 million for Air Force, and $1.1 million for DLA BRAC environmental restoration activities. Similarly to active installations, the Components allocate funds to their major commands and installations for execution.

GOOD NEWS From the Field:

FUDS Removes Suspected Chemical Warfare Materiel from Guam Residence

While excavating a waterline in July 1999, a Guam resident discovered chemical agent identification set (CAIS) canisters on his property. He contacted the Guam Environmental Protection Agency, which contacted Region 9 of the U.S. EPA.

CAIS canisters and chemical filters found in July 1999 on residential property, Mongmong, Guam.

EPA conducted an emergency response action to remove 16 canisters from the surface of the property. As there was a possibility of chemical warfare materiel being present, the cleanup was assumed by DoD's FUDS program. One week after the emergency response action, the U.S. Army Corps of Engineers (USACE) Honolulu Engineer District (HED) conducted thorough geophysical mapping of the area and excavated and removed 19 additional surface canisters within a 300-foot radius of the property.

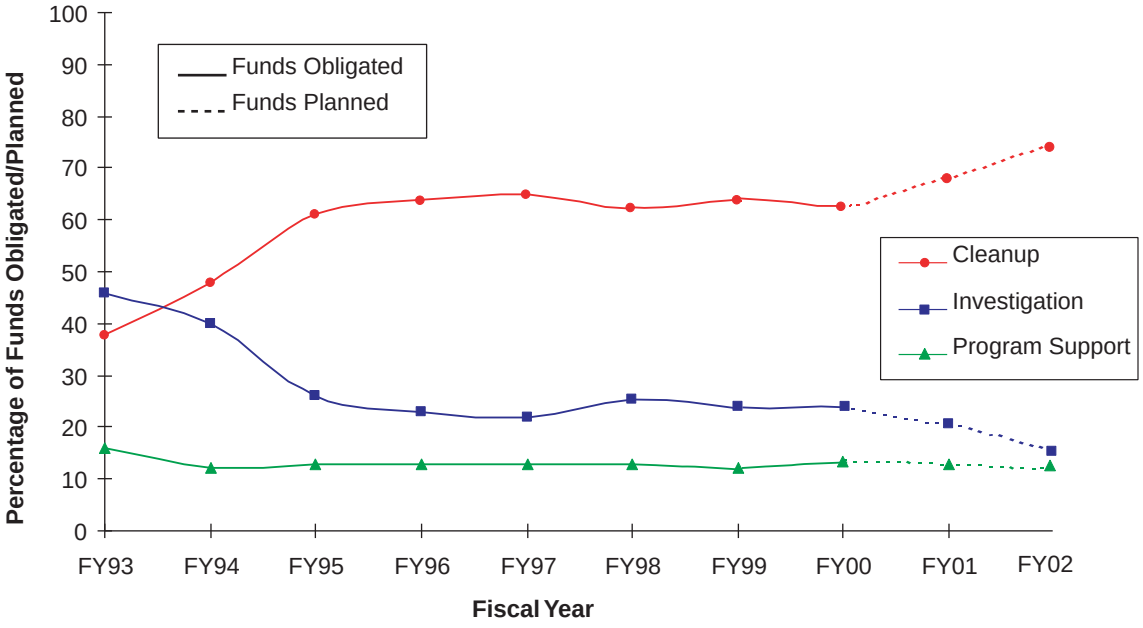
HED decided to conduct a full-scale removal action in the area in March 2000. Because the 6-acre area contained residential apartments, single-family residences, and commercial businesses, HED held numerous public meetings before, during, and after the excavation and removal of the surface CAISs. Before beginning the removal action to remove CAISs beneath the surface, HED held a successful media day and open house to acquaint the public with the upcoming action.

To complete the removal action, 588 residents were relocated for 2 weeks. HED also conducted excavation and removal operations during the night to avoid disrupting area commercial businesses. Before conducting the removal action, HED prepared a risk assessment, which provided HED with additional information to more efficiently focus its efforts and significantly reduced the costs and time required for the excavation and removal action. The risk assessment saved approximately $2 million and 6 months. As a result, this was the first chemical warfare materiel FUDS project to be completed within a year.

The project was successful because of the cooperation among federal and local agencies, including USACE's Huntsville Engineering and Support Center, the U.S. Air Force, the U.S. Navy Technical Escort Unit, Edgewood Chemical and Biological Command, U.S. EPA Region 9, the Guam Environmental Protection Agency, Guam Civil Defense, the Guam Police Department, the Governor of Guam, the Mayor of Mongmong-Maite-Toto, and the public.

N

Figure 21
ER Active Installation and FUDS Cleanup, Investigation, and Program Support Obligations and Planning Estimates



Millions of Funding Dollars Obligated/Planned
(% of Total Obligated/Planned Funds)

Category	FY96	FY97	FY98	FY99	FY00	FY01	FY02
Studies & Investigations	$334 (23)	$306 (22)	$329 (25)	$312 (25)	$345 (27)	$307 (24)	$210 (18)
Program Support	$178 (13)	$160 (13)	$161 (13)	$153 (12)	$171 (13)	$193 (14)	$177 (13)
Cleanup	$897 (64)	$845 (65)	$807 (62)	$804 (63)	$780 (60)	$809 (62)	$860 (69)
TOTAL DERA/ER FUNDING	**$1,409**	**$1,311**	**$1,297**	**$1,268**	**$1,297**	**$1,310***	**$1,247**

*Does not include $1.2 million applied against prior year DLA Huntsville U.S. Army Engineering and Support Center obligations.

Planning Funding for the Future at Active Installations and FUDS Properties

As the DERP has matured and sites have progressed from the Investigation to the Cleanup stages, DoD has spent an increasing amount of its funding on cleanup activities and a decreasing amount on investigating sites. Figure 21 shows the trends in DoD's actual and planned funding for cleanup, investigation, and program support activities, illustrating the growing proportion of DoD funds spent on cleanup and the declining proportion spent on investigations. This trend will continue as investigations are completed and more sites enter the cleanup phase.

Figure 22
Active Installation and FUDS Property Budget Year Cost Estimates by Phase Category, FY01-Complete*

Phase	Cost Estimates (in millions of dollars)							
	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08-Complete
Investigation	266,647	177,405	119,983	86,938	83,536	74,427	57,439	973,126
IRA	186,501	143,101	119,757	74,775	68,064	113,479	80,597	323,063
RD	46,683	53,589	40,784	44,526	22,681	28,290	10,600	112,161
Cleanup (RA-C)	400,486	456,023	561,734	615,412	634,641	578,986	592,333	8,408,870
RA-O	115,978	120,711	144,373	177,307	178,890	185,609	218,333	2,487,842
LTM	39,674	47,943	46,590	62,910	72,584	82,180	96,675	1,329,973
Total	**1,055,969**	**998,772**	**1,033,221**	**1,061,868**	**1,060,396**	**1,062,971**	**1,055,977**	**13,635,035**

*Does not include program management, DTRA, and some other miscellaneous costs

Estimating future costs through the end of the environmental restoration program is an important part of DoD's planning and program management efforts. This chapter has explained how DoD uses relative risk and the status of sites within the environmental restoration process to manage and execute the program. Consistent with the actual funding trend shown in Figure 21, Figures 22 and 23 show that DoD plans to spend more funding on cleanup and LTM activities and less on site investigations from now through program completion.

Figure 23
Active Installation and FUDS Property Cost-to-Complete by Phase Category and Component, FY01-Complete*

Phase	Cost Estimates (in millions of dollars)					
	Army	Navy	Air Force	DLA	FUDS	Total
Investigation	210,877	393,202	208,982	1,990	1,024,450	1,839,501
IRA	115,672	505,312	440,870	1,000	46,483	1,109,337
RD	96,454	90,702	50,476	4,323	117,359	359,314
Cleanup (RA-C)	1,818,046	1,139,270	847,920	51,398	8,391,851	12,248,485
RA-O	825,329	856,927	1,546,637	65,342	334,808	3,629,043
LTM	714,261	172,813	650,053	14,083	227,319	1,778,529
Total	**3,780,639**	**3,158,226**	**3,744,938**	**138,136**	**10,142,270**	**20,964,209**

*Does not include program management and some other miscellaneous costs

Figure 24
Active Installation and FUDS Property Budget Year Cost Estimates by Relative-Risk Category, FY01-Complete*

Relative-Risk Category	Cost Estimates (in millions of dollars)							
	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08 Complete
High	685,803	638,686	693,529	702,975	701,139	658,339	599,563	3,109,258
Medium	93,044	88,246	105,333	84,668	87,620	105,847	159,663	1,060,188
Low	53,842	66,045	64,988	67,623	71,635	78,574	87,664	484,538
Not Evaluated	37,064	28,668	25,182	27,894	31,059	36,994	22,412	462,784
Not Required	186,216	177,127	144,189	178,708	168,943	183,217	186,675	8,518,267
Total	**1,055,969**	**998,772**	**1,033,221**	**1,061,868**	**1,060,396**	**1,062,971**	**1,055,977**	**13,635,035**

*Does not include program management, DTRA, and some other miscellaneous costs

Figures 24 and 25 show DoD's estimated costs by relative-risk category through program completion. These estimates are consistent with DoD's program goals of reducing the number of high relative-risk sites by 50 percent by FY02 and by 100 percent by FY07. As shown cumulatively across the Department and by Component, DoD will spend the greatest amount of funding on sites in the high relative-risk category through FY07 to meet its goals. In later years, the greatest amount of funding is allocated to the Relative Risk Evaluation Not Required category. This category

Figure 25
Active Installation and FUDS Property Cost-to-Complete by Relative-Risk Category and Component, FY01-Complete*

Relative-Risk Category	Cost Estimates (in millions of dollars)					
	Army	Navy	Air Force	DLA	FUDS	TOTAL
High	2,615,378	1,900,558	2,049,060	21,190	1,203,106	7,789,292
Medium	555,570	492,651	427,365	14,210	294,813	1,784,609
Low	205,236	251,582	430,698	8,318	79,075	974,909
Not Evaluated	12,560	175,219	19,709	28,185	436,384	672,057
Not Required	391,895	338,216	818,106	66,233	8,128,892	9,743,342
Total	**3,780,639**	**3,158,226**	**3,744,938**	**138,136**	**10,142,270**	**20,964,209**

*Does not include program management and some other miscellaneous costs

includes sites that have reached remedy in place, response complete, or require no further action. More and more sites will move into this category as they progress through the environmental restoration process.

In FY00, the Components began funding for UXO requirements at closed, transferred, and transferring ranges in their environmental restoration budgets. Figure 26 shows funding levels for UXO cleanup by Component.

Figure 26
Planned Investments for UXO Cleanup, FY00 – FY02
(in millions of dollars)

ER	FY00	FY01	FY02
Army	0*	90,702	50,476
Navy	3,000	1,139,270	847,920
Air Force	25	6,700	1,375
FUDS	54,733	52,939	45,865
Total	**57,758**	**66,581**	**65,240**

BRAC	FY00	FY01	FY02
Army	19,243	24,153	15,116
Navy	0	0	0
Air Force	0	0	0
Total	**19,243**	**24,253**	**15,116**

* The Army executed $10.0 million in the FY00 Operations and Maintenance, Army Appropriation for planning and identification activities related to clearance and cleanup of UXO.

GOOD NEWS From the Field:

Storm King Mountain State Park Cleans Up UXO

Storm King Mountain State Park is nestled between West Point and Cornwall-on-Hudson in New York. It has long been a favorite spot for hikers, and many people are unaware of the military role this popular state park played between the mid-1800s and the mid-1900s. During that period, cadets from the U.S. Military Academy at West Point and workers at a foundry across the Hudson River used an area adjacent to the park for artillery practice. Unfortunately, some of the shells overshot the target area and landed in the park. This problem was not discovered until the summer of 1999 when a forest fire on the mountain caused ordnance to detonate. The park was immediately closed.

In March 2000, a decision was made to address this hazard under the Formerly Used Defense Site program. In subsequent meetings, the principal stakeholders made it clear that they wanted the park reopened as soon as possible and wanted the extent and nature of the hazard fully evaluated. A time-critical removal action was developed for the site, which included identifying and removing ordnance within 25 feet of the 8 miles of trails and roads in the park. The U.S. Army Corps of Engineers (USACE) began the preliminary fieldwork in June 2000, and by July the removal action was fully under way. Although rugged terrain and dense vegetation posed significant challenges, 235 anomalies within 1 foot of the surface were investigated. In total, USACE recovered and destroyed 16 75-millimeter shells and 7 M-1907 fuses, and the metal was recycled.

Work at the site is still in progress. In December 2000, a contract for an engineering evaluation and cost analysis was awarded to fully evaluate the nature and extent of the hazard and to determine whether further removal actions are warranted. This evaluation has begun and will take approximately 18 months to complete.

GOOD NEWS From the Field:

Keesler Air Force Base Converts Landfill to Wetlands

Environmental engineers at Keesler Air Force Base, Mississippi, are transforming a landfill on Biloxi Bay into a recreational area and wetland area for wildlife. Municipal and industrial wastes from the base deposited along the bay's bank created the 10-acre landfill, which operated from 1950 to 1974. Over the years, the base continued adding waste to the landfill until it created a peninsula into the bay. As more and more waste was added, the peninsula extended further into the bay.

In 1994, the U.S. EPA and the Mississippi Department of Environmental Quality determined that the landfill posed a potential hazard to the bay. Tidal influence, hurricanes, and stormwater runoff had caused landfill debris along the sides and top of the landfill to erode into the bay.

Aerial photograph of landfill at Keesler Air Force Base prior to containment and conversion to a wetland.

In response to this concern, the base worked with U.S. EPA and Mississippi regulators to design landfill-stabilization measures. Construction workers erected a vertical containment wall of steel piling sheets along the perimeter of the landfill to prevent debris from further eroding into the bay. Workers drove the long sheets through the water into underlying soil, stabilizing the landfill boundary. They also relocated stormwater piping to discharge runoff water past the sheet-piling wall. In addition, a wetland mitigation program created new wetlands west of the landfill. The landfill area was graded to promote positive drainage and will be capped with clay to reduce infiltration of stormwater into the landfill. Once the construction began to take shape, officials realized the potential for returning the site to productive use. Large pieces of concrete were placed along the outside of the sheet pile and the stormwater channel created new habitat for back bay water species. Now the former landfill serves as a productive wetland, providing habitat for wildlife and an area that people can enjoy. Not only does the new habitat prevent erosion and surface water runoff, but also what used to be an eyesore is now a safe haven for numerous species of fish, shellfish, plants, and wildlife native to the Gulf Coast.

GOOD NEWS From the Field:

Army Completes Interim Removal Action at Seabee Compound

The U.S. Army recently completed an interim removal action at the Seabee Compound, one of several contaminated sites at the Joint Forces Training Base, Los Alamitos, California. The installation is located in a well-developed area that includes a school and a residential neighborhood adjacent to the installation. The Seabee Compound was used by a U.S. Naval Reserve Construction Battalion Unit until 1994. The six buildings in this area were used for vehicle and heavy equipment maintenance, hazardous material storage, battery maintenance and storage, and administrative uses.

Groundwater samples collected from the compound indicated high levels of contaminants, particularly chlorinated solvents and fuel constituents, from both gasoline and diesel. Historic records confirmed that solvents had been used extensively at the installation. The site also contained a 7,500-gallon underground storage tank that was used to store waste solvents, and a three-stage clarifier that collected wastewater from parts- and vehicle-washing operations.

Shallow groundwater at the installation often rises to the surface during rainstorms, and contaminants transported with the water posed an immediate threat to human health. Because of this risk, a dual-phase vacuum extraction (DPVE) system was installed to clean up the shallow groundwater and soil. DPVE is like a large vacuum that can remove contaminants from soil and groundwater at the same time. The goal of using DPVE was to provide an effective, rapid, in-ground soil and groundwater contaminant removal system.

The full-scale interim removal action began in late October 1998 and was completed in August 2000. Accomplishments included—

- Completing the removal action in less than 2 years
- Removing more than 180 pounds of chlorinated solvents
- Obtaining site closure from the California Regional Water Quality Control Board
- Planning for reuse of the remediation equipment at another location.

To measure the effectiveness of the DERP, DoD has developed cleanup performance goals for its installations and properties, which it evalutes through established metrics. Illustrating progressive program success, DoD has achieved Response Complete status at 70 percent of active sites and 60 percent of BRAC sites. Looking ahead to FY01, DoD is pursuing several important initiatives, including incorporating UXO into all aspects of the program and updating the DERP Management Guidance to incorporate business process changes and evolving requirements. DoD also continues to pursue innovative and expanded community involvement initiatives, such as the environmental cleanup stakeholders forum. Cleanup success begins at the site-level, but the Department's ultimate goal is to complete environmental restoration activities at all sites on an installation or property. DoD's continued success depends on receiving predictable funding to meet cleanup requirements.