
INSTALLATION RESTORATION PROGRAM FY01 STATUS AND PROGRESS



How is what we are doing throughout the DoD environmental restoration program relevant to the core mission of the Department and the Military Services? A healthy and productive environment is key to raising and supporting forces in the field. The business of our Department is to enhance in every possible way our national security strategy. Environmental restoration helps us meet that goal. Environmental restoration is good management of the resources entrusted to us by the American people. Each installation exists in the broader context of a community, a country, and a state. Our restoration efforts demonstrate that we are ready, willing and able to manage facilities prudently and responsibly. Restoration is a reflection of the high ethical values of our people and the Nation they represent. The world's greatest military deserves a world-class environmental program.

-John Paul Woodley, Jr., Assistant Deputy Under Secretary of Defense (Environment)

As discussed in Chapter 1, the Installation Restoration program (IRP) addresses the environmental impacts of hazardous substances remaining from past practices on Department of Defense (DoD) installations and former properties. This chapter presents DoD's environmental restoration activities on its 27,000 IRP sites. Activities associated with the Military Munitions Response program are covered in the next chapter. The considerable size of the Defense Environmental Restoration Program (DERP), particularly within the IRP—in terms of number of sites and time to complete—requires extensive resources, comprehensive planning, and rigorous oversight. To keep the program on track and measure its progress, DoD developed program and performance measures goals for its IRP sites and projects. These program goals focus on getting remedies in place and completing needed cleanup requirements at sites. DoD established performance metrics, called measures of merit, to assess progress in meeting these IRP goals. Each year the Department assesses progress in relative-risk reduction, phase progress, remedy in place (RIP) and response complete (RC)

progress, and making acreage at base realignment and closure (BRAC) property environmentally suitable for transfer.

DoD set program goals for its IRP sites at active installations and Formerly Used Defense Sites (FUDS) properties according to site relative-risk categories. These categories are discussed later in this chapter. DoD's system for prioritizing work and allocating restoration resources generally focuses on addressing the worst sites first. At active installations and FUDS properties within the IRP, 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 is nearing its FY02 goal, having reduced the number of high relative-risk sites by 44 percent as of September 30, 2001.

In fulfilling its environmental restoration obligations at BRAC installations, DoD places great importance on supporting reuse and having property quickly available for transfer. For this reason, BRAC installation goals are different from those at active installations. At these 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 with respect to hazardous substances. Acreage in Categories 1 through 4 satisfy the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements for property transfer. Acreage in Categories 5 through 7 requires some cleanup or evaluation.

The Department did not achieve its FY01 BRAC goals due to technical issues and fluctuating funding levels, which impacted planned accomplishments. Stable, adequate funding is required if DoD is to attain the FY05 program goals. Additional information regarding BRAC acreage is provided in Appendix E.

The Environmental Restoration Process

DoD installations and properties vary greatly in size and function. An installation may encompass thousands of acres and may contain industrial operations, office and commercial

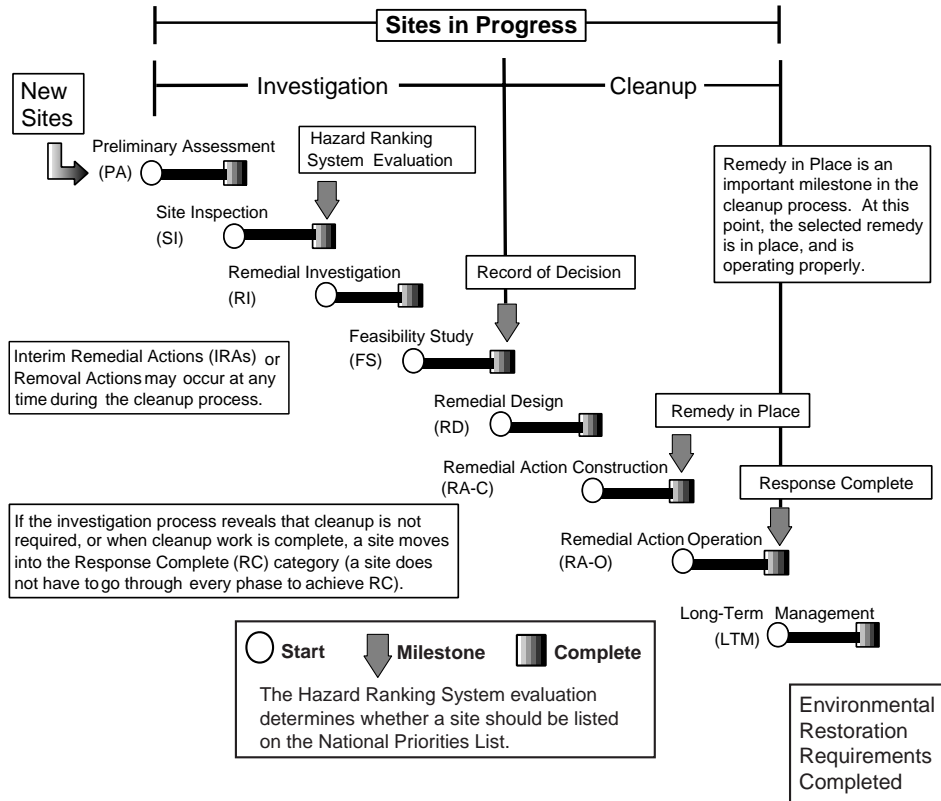
buildings, training ranges, runways, housing units, forests, or other pristine locations. These installations and properties generally contain only small areas of localized contamination within their boundaries, with no contamination impacting the remaining land. DoD terms these contaminated areas “sites” (except the FUDS program, which refers to these areas as “projects”). Defining these discrete parcels of land provides the Department a more effective approach to cleanup through tracking and managing the DERP on a site-by-site basis.

CERCLA and Section 2701 of Title 10 of the U.S. Code, which established the DERP, are the primary legal authorities governing cleanup activities at DoD installations and properties. The cleanup actions at each DoD installation and FUDS property, therefore, adhere to the requirements set forth in the response process outlined in CERCLA and its implementing regulation, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This response process consists of several phases, as illustrated in Figure 11. While some phases may overlap or occur concurrently, response activities at DoD sites are generally conducted in the shown order.

Investigation

When the presence of contamination is suspected at a site, DoD begins the investigation process by conducting a preliminary assessment (PA). The PA typically is a limited-scope investigation to determine whether or not a chemical release has occurred, and further investigation is warranted. A PA may include installation or property document reviews, visual site inspections, and interviews with installation or property personnel. The site inspection (SI) generally

**Figure 11
Environmental Restoration Process Phases and Milestones**



involves collection of additional information data to help DoD decide whether or not environmental restoration activities are necessary. DoD may determine during the SI that the site poses no risk and requires no further action.

If findings of the PA/SI indicate the site requires additional investigation, DoD will conduct a remedial investigation (RI). The RI involves more comprehensive data collection at the site, such as collection and analysis of soil and groundwater samples. Using these data, the Department assesses the nature and extent of and the potential risks posed by the contamination. DoD then evaluates the merits of various cleanup options and determines the best practical strategy for its cleanup response. This is the feasibility

study (FS). The completion of the investigation phase is documented in a record of decision (ROD) or equivalent decision document. DoD records the results of its investigation activities, including the selected cleanup strategy and remediation objectives it will reach, in the ROD. The ROD may also document that no further action will be taken, if DoD determines that the site poses no risk to human health or the environment. Under this process, sites reaching a no further action determination are considered to be RC.

Cleanup

If DoD determines that action beyond the investigation portion of the environmental

restoration process is required, the cleanup segment begins to implement the chosen remedy for the site. This stage comprises remedial design (RD) and remedial action construction (RA-C), and may include remedial action operation (RA-O). If required, operation of the remedy continues until the cleanup objectives required by the ROD for that site have been met. Some sites may require a review of the remedial action at least every five years after the remedial action is initiated. These reviews are performed to ensure that the remedy is functioning as designed and that any necessary operation and maintenance activities are taking place.

There are two important DoD environmental restoration milestones in the cleanup portion of the process. The remedy in place, or RIP, milestone marks the point at which DoD has completed constructing the remedy, and the remedy is operating effectively. The response complete, or RC, milestone is reached when all cleanup objectives specified in the site's ROD or decision document have been met. After reaching the RC milestone, a site may require long-term management (LTM) activities to ensure the implemented remedy remains effective. This phase, formerly called long-term monitoring, includes environmental monitoring, review of site



FOCUS ON THE FIELD:

Cooperative Multisite Agreement Leads to Successful Cleanup at the Scranton Army Ammunition Plant

The Scranton Army Ammunition Plant is the first Pennsylvania military facility to complete an installation-wide cleanup under a cooperative multisite agreement with the Pennsylvania Department of Environmental Protection (PADEP). Cleanup work at the plant included removing nine feet of soil underneath tanks where fuel oil had spilled, removing two feet of soil in an area where PCBs had spilled, and pumping and treating contaminated groundwater.

In 1998, PADEP signed a cooperative multisite cleanup agreement with the Departments of the Army, Navy, and Air Force and the Defense Logistics Agency to clean up environmental contamination at more than 1,000 military sites in Pennsylvania. It was the first such agreement in the nation. The agreement began a comprehensive effort to assess and eliminate the potential environmental and public health risks at all military sites in Pennsylvania.

Successes resulting from the agreement also included completing cleanups at several sites at the Defense Depot Susquehanna Plant in New Cumberland; soil cleanup at several sites at the Naval Inventory Control Point in Philadelphia; contributions to cleanups at the Marine Corps Training Center in Freemansburg, and the former Claysburg Air Force Station in Blair County; and soil cleanup at the former Olmstead Air Force Base, now the Harrisburg International Airport.

conditions, and/or maintenance of a remedial action to ensure that the established remedy continues to meet the objectives prescribed in the ROD. DoD is committed to ensuring human health and the environment are protected at all sites.

Readiness through Restoration

DoD uses several metrics to determine the progress of IRP sites as they advance through the environmental restoration process. Examining phase progress—the number of sites that are undergoing investigations or cleanup or that have achieved RC—provides DoD with a snapshot of the IRP's overall progress toward completion. Increasing the number of sites in the cleanup phase and that have achieved RC, coupled with decreasing site numbers in investigation, indicate progress through the environmental restoration process. The DERP's overarching goal is to move each site through the appropriate environmental restoration phases and complete all applicable remediation requirements.

Figures 12, 13, and 14 highlight the site status of all IRP sites at active installations, BRAC installations, and FUDS properties, respectively.

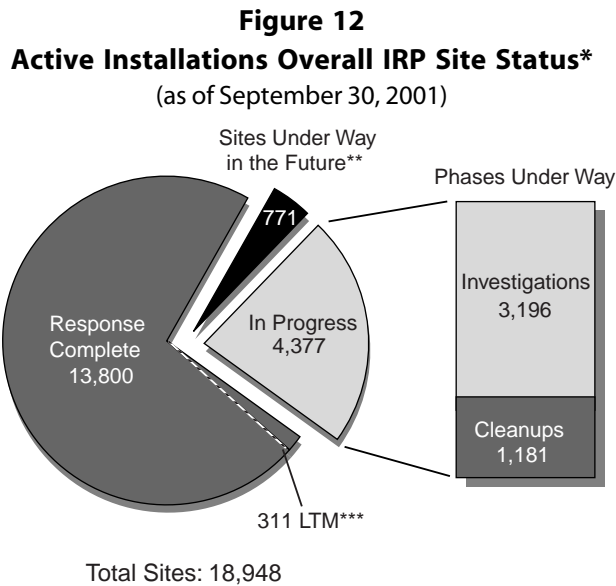


Figure 13
BRAC Installations Overall IRP Site Status*
(as of September 30, 2001)

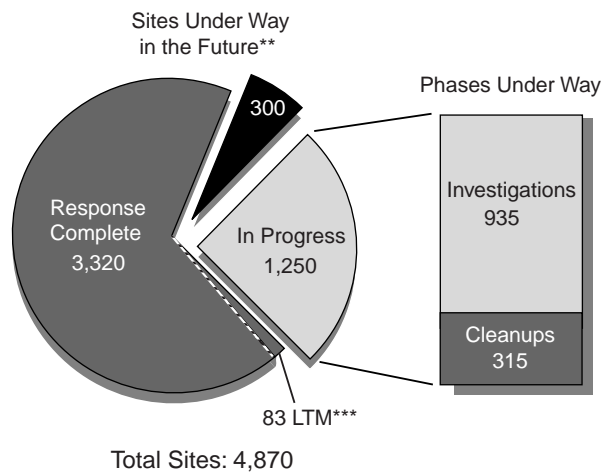
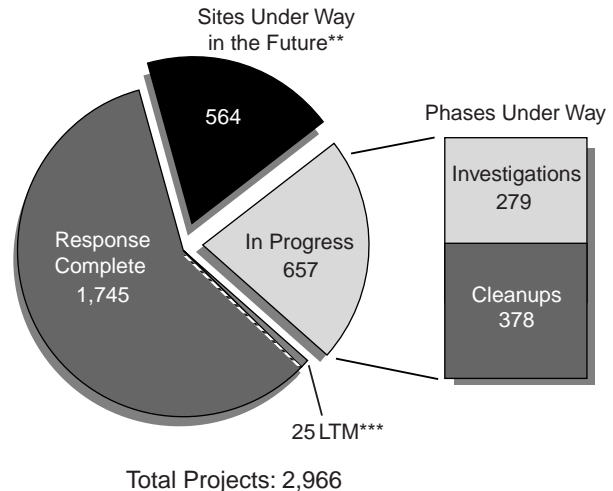


Figure 14
FUDS Properties Overall IRP Project Status*
(as of September 30, 2001)



*Includes incidental munitions work (i.e., non-MMRP)

**Includes sites with future preliminary assessment starts planned and sites that are between phases.

***LTM is a subset of Response Complete.



FOCUS ON THE FIELD:

Puget Sound Naval Shipyard Executes Aquatic Disposal Dredging Project

After more than a century of repairing naval vessels, the Puget Sound Naval Shipyard (PSNS), Washington, was faced with cleaning up historic contamination and a newer challenge of permanently basing nuclear-powered aircraft carriers in its homeport. In the mid 1990s, planning and permitting began to create deeper and wider berths for these aircraft carriers using a Military Construction (MILCON) project. To create these berths, PSNS had to dredge 368,000 cubic yards of sediment.

Also during the 1990s, under a process separate from MILCON, the Navy proposed cleaning up marine sediments in Sinclair Inlet, a historic fishing ground for the Suquamish Tribe. The Inlet was contaminated with polychlorinated biphenyls and mercury from past operations, and required removing 217,000 cubic yards of contaminated sediments.

Engineers developed a plan to combine both projects, which maximized the dredging rates while reducing project delays, reduced impacts to the marine environment and shipyard operations, and, most significantly, reduced overall project costs. As a result, the Navy planned, received approval, designed, constructed, filled, and capped the first underwater confined aquatic disposal (CAD) pit in the Puget Sound region in less than three years. Regulators also granted approval for contaminated sediments from both projects to be placed in the same CAD pit.

As the project neared completion, 40,000 cubic yards of sediment remained to be dredged. PSNS proposed using this remaining sediment, which was not contaminated, as a final cap for the CAD pit. Regulators approved the plan, which resulted in an additional \$400,000 in cost avoidance, compared to capping the CAD pit with imported sand. Overall, this innovative project avoided costs of nearly \$43 million over conventional cleanup alternatives.



Installing sheetpile wall at Site 1



Dredging the confined aquatic disposal pit

Sites are classified according to their end-of-year FY01 status, and are listed as undergoing investigation or cleanup (i.e., in progress), awaiting future work, or having achieved RC status. As shown in these figures, DoD had achieved RC at 73 percent of active sites, 68 percent of BRAC sites, and 59 percent of FUDS projects by the end of FY01. In total, DoD has

achieved RC at 70 percent of IRP sites, an increase of 4 percent from FY00.

In achieving RC at 1,594 sites and projects in FY01, DoD demonstrates continuing progress toward fulfilling its environmental restoration goals and responsibilities. Many sites achieve RC directly following investigation activities, when it is determined that the site poses no risk to human health and the environment. As shown in Figures 15, 16, and 17, respectively, 78 percent of active installation sites and FUDS projects have achieved the RC milestone through investigation only, while 73 percent of BRAC installation sites achieved RC in this way. In recent years, the ratios between RC through investigation versus cleanup has been declining.

Figure 15
Active IRP Sites with Response Complete*

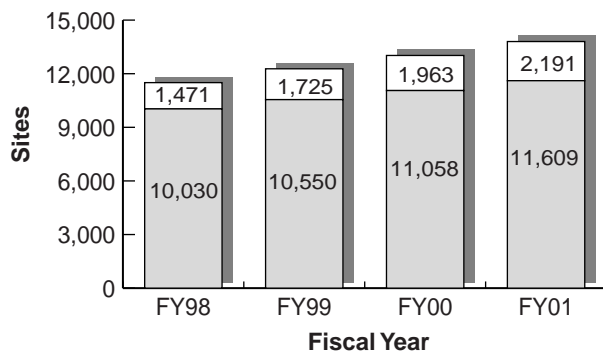


Figure 16
BRAC IRP Sites with Response Complete*

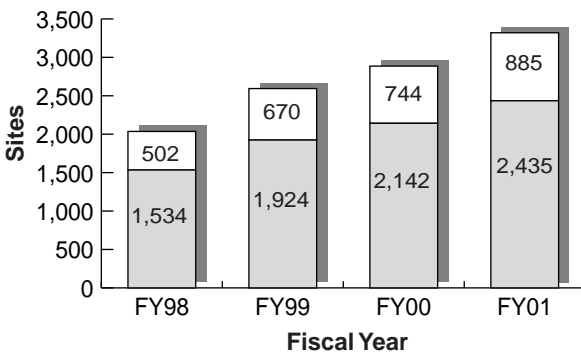
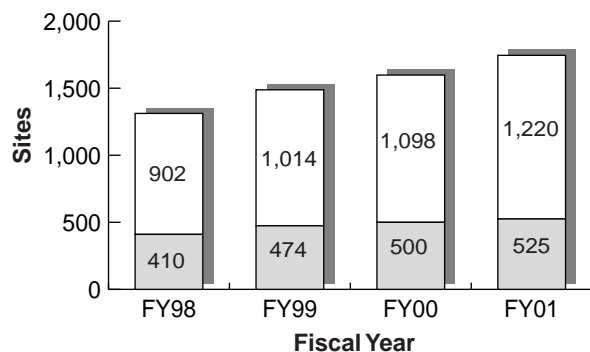


Figure 17
FUDS IRP Projects with Response Complete*



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

*FY98 through FY00 totals have been updated since the previous Annual Report to reflect new and revised data as of FY01.

Interim actions, which may be either interim remedial or interim removal actions, are vital methods of mitigating immediate risks to human health and the environment. Interim actions are typically short-term, and can be implemented at any point in the environmental restoration process. In some cases, these quick responses can eliminate or sufficiently reduce risk at the site, so that no further action is needed. Figures 18, 19,

and 20 display the number of cumulative interim actions completed at active and BRAC installation IRP sites and FUDS projects. As of the end of FY01, 4,716 interim actions had been completed at DoD sites and FUDS projects to address immediate concerns. Of that amount, 3,271 were implemented at active installation sites, 1,338 were performed at BRAC installation sites, and 107 were completed at FUDS projects.

Another measure DoD uses to monitor its progress is achievement of RIP/RC at the installation and property level. A DoD installation or FUDS property achieves RIP or RC status when every site or project at the installation or property has all remedies in place or has reached RC. By the end of FY01, DoD had achieved RIP or RC at 71 percent of its installations and properties. This represents 76 percent of active installations, 60 percent of BRAC installations, and 52 percent of FUDS properties. Figures 21, 22, and 23 display DoD's expected RIP/RC completion trends.

Figure 18
Cumulative Interim Actions Completed at Active IRP Sites*

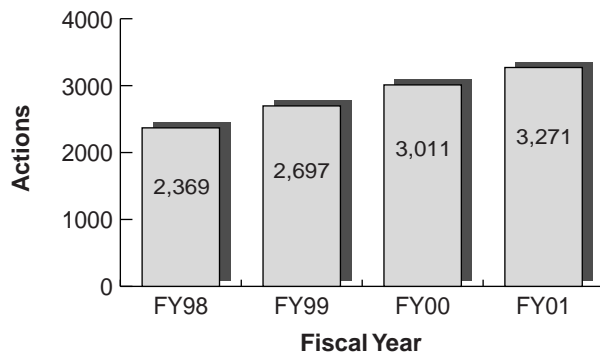


Figure 19
Cumulative Interim Actions Completed at BRAC IRP Sites*

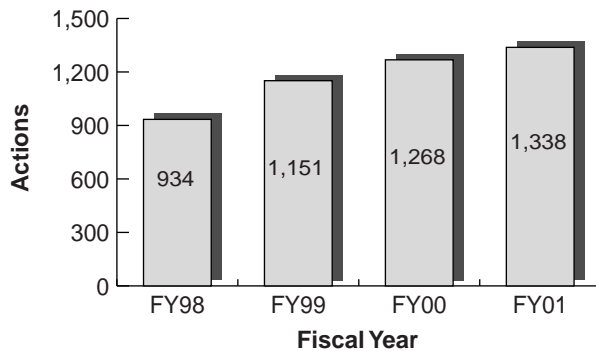
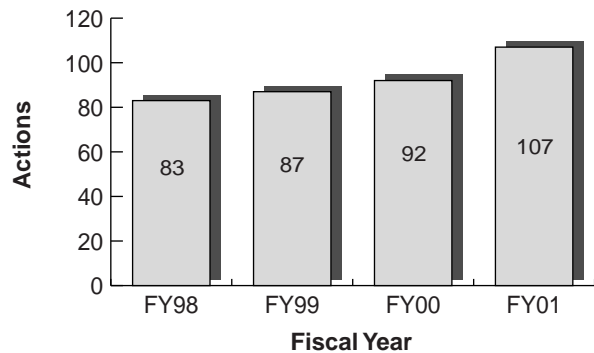
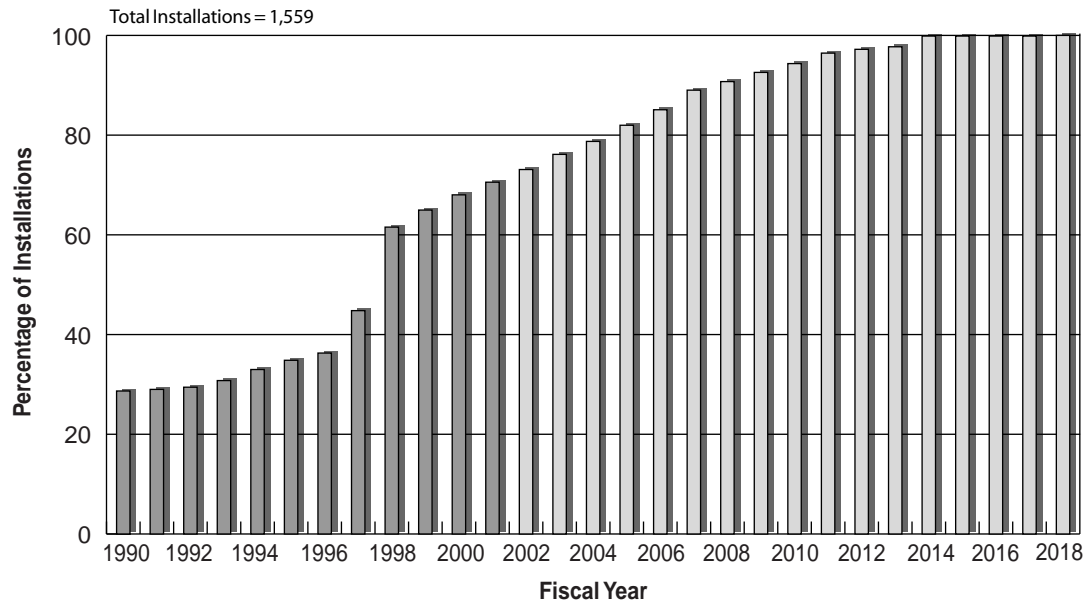


Figure 20
Cumulative Interim Actions Completed at FUDS IRP Projects*



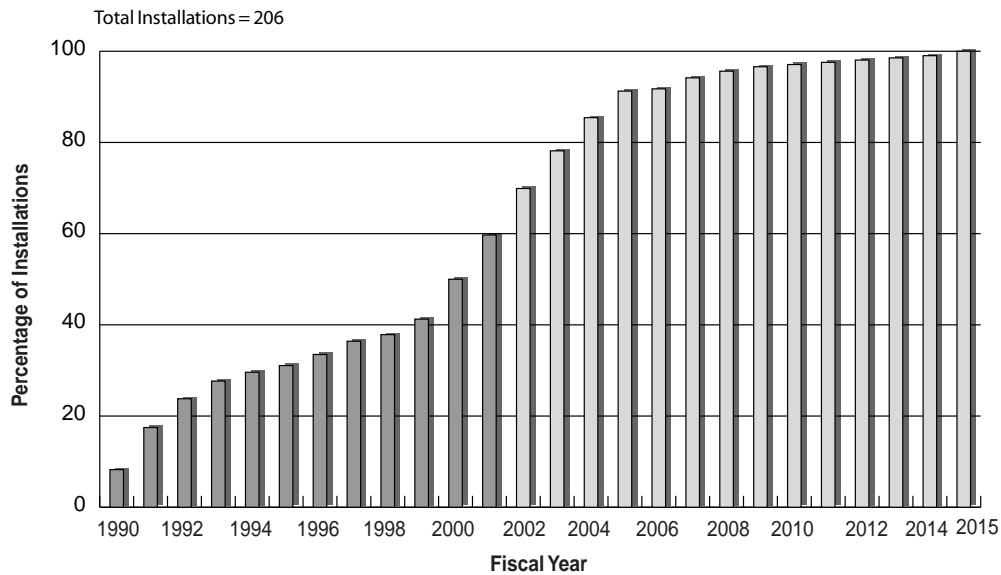
*FY98 through FY00 totals have been updated since the previous Annual Report to reflect new and revised data as of FY01.

Figure 21
DoD Active Installations Achieving Final Remedy in Place or Response Complete
at All IRP Sites*
 (cumulative and projected, FY90 through completion)



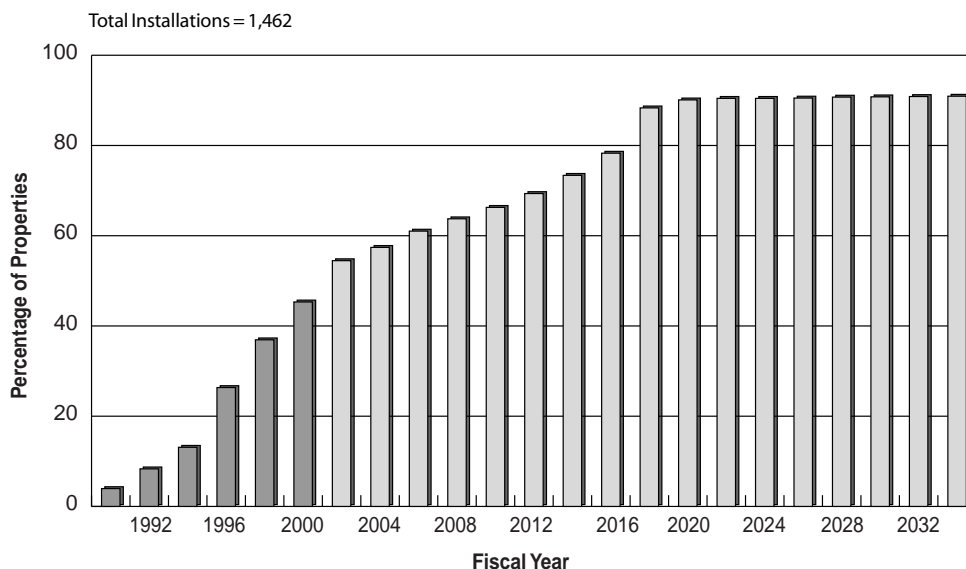
*Does not include MMRP sites or UXO sites incidental to IRP cleanup.

Figure 22
BRAC Installations Achieving Final Remedy in Place or Response Complete at All IRP Sites*
 (cumulative and projected, FY90 through completion)



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

Figure 23
FUDS Properties Achieving Final Remedy in Place or Response Complete at All IRP Sites*
 (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 MMRP, building demolition and debris removal, potentially responsible party, or No DoD Action Indicated properties or projects.

Preparing for the Future

A program that encompasses more than 28,500 sites and projects across the country and U.S. territories requires considerable resources. Not every site can be remediated simultaneously, which means that careful consideration and planning is required to prioritize sites for action. DoD aims to address all sites, but places emphasis on addressing first the sites that pose the greatest risk to human health and the environment.

To this end, DoD developed the Relative-Risk Site Evaluation (RRSE) framework, which evaluates the risk posed by each site relative to all other sites within the DERP. DoD evaluates each site based on three factors—

the nature and extent of the contaminant, the potential for it to migrate, and receptors that could be impacted by the contamination. Once DoD has assessed this information, the site or project is designated as having high, medium, or low relative-risk. DoD also considers other aspects in sequencing sites for cleanup; these include risk assessments, installation cleanup strategy, program goals, and stakeholder concerns.

In addition to the high, medium, and low relative-risk categories, the RRSE framework contains the designations Not Evaluated (NE) and Not Required (NR). Sites in the NE category have not been investigated thoroughly enough to allow DoD to determine their relative-risk ranking. Sites may also be categorized as NE if no comparison value is available for the

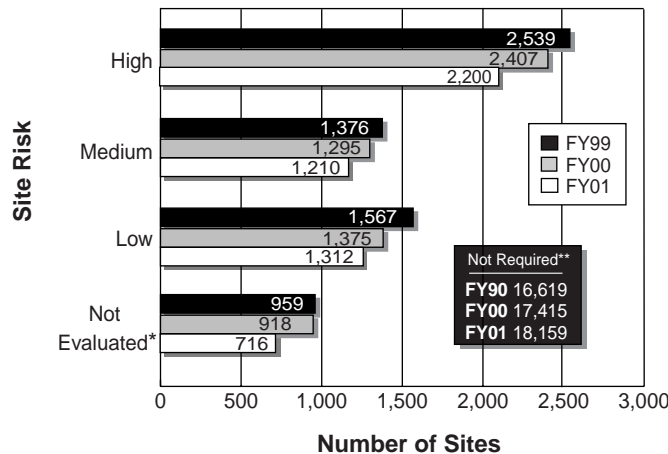
contaminant(s) or the site is not accessible due to safety reasons. DoD is working to reduce the number of sites in the NE category; over the past fiscal year it reduced the number of these sites by 15 percent. Sites listed as NR may either have already achieved RIP or RC, or RRSE does not apply to the site if the site only requires military munitions response, building demolition and debris removal (BD/DR), or potentially responsible parties are doing the work. There is no longer a need to apply RRSE to these sites, either because DoD has committed to funding the sites' RA-O and LTM requirements, or because no additional work is planned for the sites.

Reviewing the number of sites in each relative-risk category is another metric to measure progress in the program. Figure 24 shows the number of sites in each relative-risk category, from FY99

through FY01, for active installations and FUDS properties. As previously stated, one of DoD's goals is to reduce the number of high relative-risk sites by 50 percent by FY02 and by 100 percent by FY07. In FY01 alone, DoD removed 207 high relative-risk active sites and FUDS projects. In addition to reducing the number of high relative-risk sites, DoD has reduced the number of sites ranked as medium and low relative-risk, as well as those that have not been evaluated. As these sites are remediated, the number of sites that no longer require a relative-risk ranking continues to increase.

As shown in the previous chapter, DoD continues to spend increasing resources on cleanup over investigation which, is affirmed in Figures 25 and 26. These figures display DoD's estimated costs

Figure 24
Active Installation and FUDS Property
Relative-Risk Site Evaluation Progress



*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.

**The Not Required category includes other FUDS projects that do not require relative-risk rankings, such as ordnance and explosives waste, building demolition and debris removal, and potentially responsible party projects.

for active installations and FUDS properties through the end of the environmental restoration program.

Figures 27 and 28 display DoD's estimated costs by relative-risk category through program completion. These estimates are consistent with DoD's program goal of reducing high relative-risk sites by 50 percent by FY02 and 100 percent by

FY07. As the data show, DoD will spend the largest portion of funding on sites in the high relative-risk category through FY07 to meet this program goal. The Not Required category includes all sites that have achieved RIP or RC or require no further action. The number of sites in this category will continue to increase as

Figure 25
Active Installation and FUDS Property Cost-to-Complete Estimates
by Phase Category, FY02-Complete*

Phase	FY02	FY03	FY04	FY05	FY06	FY07	FY08 - Complete
Investigation	241,370	151,987	111,978	92,974	87,759	52,772	310,233
IRA	170,022	138,894	95,425	84,464	123,632	78,861	334,307
RD	35,673	57,471	49,042	38,972	27,562	17,934	114,493
RA-C	356,927	450,020	539,816	581,503	510,742	551,819	2,106,343
RA-O	128,412	138,744	159,864	169,493	201,342	216,233	2,681,391
LTM	38,571	53,579	58,071	80,831	89,977	97,856	1,256,044
Total	970,975	990,695	1,014,196	1,048,237	1,041,014	1,015,475	6,802,811

*Does not include program management, DTRA, other miscellaneous costs, and MMRP funding. MMRP funding is shown in Chapter 4 of this report.

Figure 26
Active Installation and FUDS Property Cost-to-Complete Estimates
by Phase Category and Component, FY02-Complete*

Phase	Army	Navy	Air Force	DLA	FUDS	Total
Investigation	251,622	405,492	145,864	920	245,175	1,049,073
IRA	104,093	547,903	347,346	0	26,263	1,025,605
RD	81,812	42,202	73,623	1,275	142,235	341,147
RA-C	1,687,984	862,694	918,663	31,435	1,596,394	5,097,170
RA-O	633,972	851,300	1,733,772	59,977	416,458	3,695,479
LTM	567,459	198,210	666,502	30,117	212,641	1,674,929
Total	3,326,942	2,907,801	3,885,770	123,724	2,639,166	12,883,403

*Does not include program management, DTRA, other miscellaneous costs, and MMRP funding. MMRP funding is shown in Chapter 4 of this report.

Figure 27
Active Installation and FUDS Property Cost-to-Complete Estimates
by Relative Risk, FY02-Complete*

Relative-Risk	fy02	fy03	fy04	fy05	fy06	fy07	fy08 - complete
High	597,578	645,304	676,143	717,362	720,181	624,834	3,219,853
Medium	118,914	132,785	115,171	109,048	104,968	144,698	1,247,265
Low	67,606	53,739	64,496	75,042	50,253	64,891	656,345
Not Evaluated	23,535	30,777	31,191	34,866	34,738	27,229	497,484
Not Required	163,342	128,090	127,195	111,919	130,874	153,823	1,181,864
Total	970,975	990,695	1,014,196	1,048,237	1,041,014	1,015,475	6,802,811

*Does not include program management, DTRA, other miscellaneous costs, and MMRP funding. MMRP funding is shown in Chapter 4 of this report.

Figure 28
Active Installation and FUDS Property Cost-to-Complete Estimates
by Phase Category and Component, FY02-Complete*

Relative-Risk	Army	Navy	Air Force	DLA	FUDS	Total
High	2,252,688	1,775,050	1,944,324	22,216	1,206,977	7,201,255
Medium	535,458	437,535	571,678	11,804	416,374	1,972,849
Low	168,814	262,695	412,498	15,337	173,028	1,032,372
Not Evaluated	10,884	51,309	8,710	5,835	603,082	679,820
Not Required	359,098	381,212	948,560	68,532	239,705	1,997,107
Total	3,326,942	2,907,801	3,885,770	123,724	2,639,166	12,883,403

*Does not include program management, DTRA, other miscellaneous costs, and MMRP funding. MMRP funding is shown in Chapter 4 of this report.

sites progress through the environmental restoration process.

Figures 29 displays DoD's estimated costs for BRAC installations through the end of the environmental restoration program. These data show that funding estimates consistently decrease

over time, corresponding with progress toward completing DoD's environmental restoration program requirements. The data presented in Figure 30 shows that, similar to restoration activities at active installations, the majority of remaining BRAC funding will be spent on

cleanup activities over investigation.



The information provided in this chapter and in Appendixes B and C of this report present detailed information on BRAC remediation costs, fulfilling the requirements of the FY02 Military Construction Act (Public Law 107-64, §131).

DoD is developing a protocol separate from RRSE to prioritize activities at military munitions response sites. DoD's Military Munitions Response program and accompanying prioritization protocol is discussed in the following chapter.

Figure 29
BRAC Installation Environmental Restoration
Cost-to-Complete Estimates by Phase Category, FY02-Complete*

Phase	FY02	FY03	FY04	FY05	FY06	FY07	FY08- Complete
Investigation	61,381	21,768	3,957	44	0	0	2,822
IRA	82,957	30,627	14,241	1,414	1,263	414	2,762
RD	23,989	18,826	5,793	2,014	762	466	3,174
RA-C	181,723	234,197	103,508	47,780	10,919	6,424	118,322
RA-O	68,945	79,979	85,248	98,964	73,092	74,019	1,388,074
LTM	23,286	25,163	27,049	22,755	26,571	21,496	292,051
Total	442,281	410,560	239,796	172,971	112,607	102,819	1,807,205

*Does not include program management, other miscellaneous costs, or MMRP funding.

Figure 30
BRAC Installation Environmental Restoration
Cost-to-Complete Estimates by Phase Category and Component, FY02-Complete*

Phase	Army	Navy	Air Force	DLA	Total
Investigation	25,768	27,468	36,736	0	89,972
IRA	3,864	59,834	69,980	0	133,678
RD	15,415	23,751	15,777	81	55,024
RA-C	238,519	399,771	62,145	2,438	702,873
RA-O	134,973	312,873	1,395,374	25,101	1,868,321
LTM	123,550	100,277	213,519	1,025	438,371
Total	542,089	923,974	1,793,531	28,645	3,288,239

*Does not include program management, other miscellaneous costs, or MMRP funding.