Mapping the Future of Environmental Restoration

Most Americans regard our military men and women as defenders of our nation and the foundation of U.S. national security. Many are not aware that in addition to defending our country at home and abroad, the Department of Defense (DoD) is fully engaged in fulfilling another part of its responsibilities—restoring the environment damaged by contamination from past defense activities.

To maintain the ability to defend our country against security threats, our forces have conducted—and must continue to conduct—training and operations on land, at sea, and in the air. DoD's continued commitment to cleaning up past contamination helps the Department sustain the support it needs to continue using the land it holds in the public trust. Through the Defense Environmental Restoration Program (DERP), DoD is working to clean up the environment and protect human health in all 50 states, the District of Columbia, and 8 U.S. territories. This program covers environmental restoration activities at active installations, installations that are closing or whose missions are being realigned, and formerly used defense sites (FUDS).

The Department is proud of its cleanup successes, but also acknowledges that it still has some complex issues to address. DoD has built a strong environmental cleanup program over the past two decades. Now the DERP is charting a course for completing environmental restoration requirements. By integrating innovative business approaches with DoD's best practices, embracing stakeholder involvement and new partnerships, and adopting innovative solutions and technologies, DoD is mapping the future of environmental restoration to achieve continued program success. Through this report and DoD outreach activities, the Department hopes to give stakeholders a better understanding of the DERP to enable them to assist DoD in guiding the environmental restoration program to completion.

Our cleanup program is charting a course to program completion. We built the structure, we have the tools, and we are focusing on completing all environmental restoration requirements.

DoD's Environmental Restoration Program

In the decades before industry, government, and citizens realized that common manufacturing and disposal practices were harmful to the environment, DoD carried out operations much like industry's. For example, accidental fuel spills from trucks and airplanes were not a concern, and it was common practice to dispose of wastes in unlined landfills.

Recognizing a growing awareness of environmental issues, DoD began environmental restoration activities in 1975 under its Installation Restoration Program. At that time, DoD was not legally required to address property impacted by past operations. This situation changed in 1980, when in response to growing public concern and increasing knowledge about the environment, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund. This law requires responsible parties to clean up releases of hazardous substances to the environment. The 1986 Superfund Amendments and Reauthorization Act (SARA) refined and expanded CERCLA, and formally established the DERP and its funding mechanism, the Defense Environmental Restoration Account (DERA).

The FUDS program, overseen by the Army, addresses environmental restoration at properties once owned or used by DoD.

Although other parties—local governments, businesses, or private citizens—now own these properties, DoD is responsible for impacts on the environment caused by its past activities.

Also during the 1980s, Congress recognized that DoD no longer needed some of its installations, and that realigning missions and workload at other installations could improve DoD's efficiency. This realization prompted Congress to authorize four rounds of base realignment and closure (BRAC) in 1988, 1991, 1993, and 1995. DoD is cleaning up both installations intended for transfer to non-DoD parties for other uses and realigned installations that remain DoD property. Environmental restoration at closing and realigning installations is funded through the BRAC account, but is managed as part of the DERP.

To increase the accountability of the Military Components and decentralize the program, in 1996 DoD devolved DERA into five separate Environmental Restoration (ER) accounts for funding cleanup at active installations and FUDS properties. Since the devolvement of restoration funding, the Army, Navy, and Air Force now manage their own ER accounts. The Army oversees the U.S. Army Corps of Engineers' (USACE's) execution of the ER account for the FUDS program, which addresses cleanup of properties that were once owned or used by DoD. A fifth ER account funds the Defense Logistics Agency (DLA) cleanup

program, the Defense Threat Reduction Agency (DTRA) cleanup program, and the Office of the Secretary of Defense, Cleanup, which provides program guidance and management oversight.

The timeline on the following page (Figure 1) highlights key events in the history of DoD's environmental restoration program.

The Components comprise the Army, Navy, Marine Corps, Air Force, DLA, and DTRA. The term "Services" refers only to Army, Navy, and Air Force.

GOOD NEWS From the Field:

"Must-HAVE" Technology at Pre-World War II Tank Farm Area

The tank farm area on Amaknak Island near Rocky Point, Alaska, was constructed in the early 1920s to store fuel to resupply ships in the area. It was dismantled during World War II after the Japanese bombed nearby Dutch Harbor in 1942. During the raid, tanks in the Rocky Point area were damaged and caught fire. The remaining tanks were drained immediately after the raid to prevent them from causing fires in subsequent raids. It is believed that when the tanks were emptied, the fuel was drained onto the ground. The contamination from this fuel is still present today.

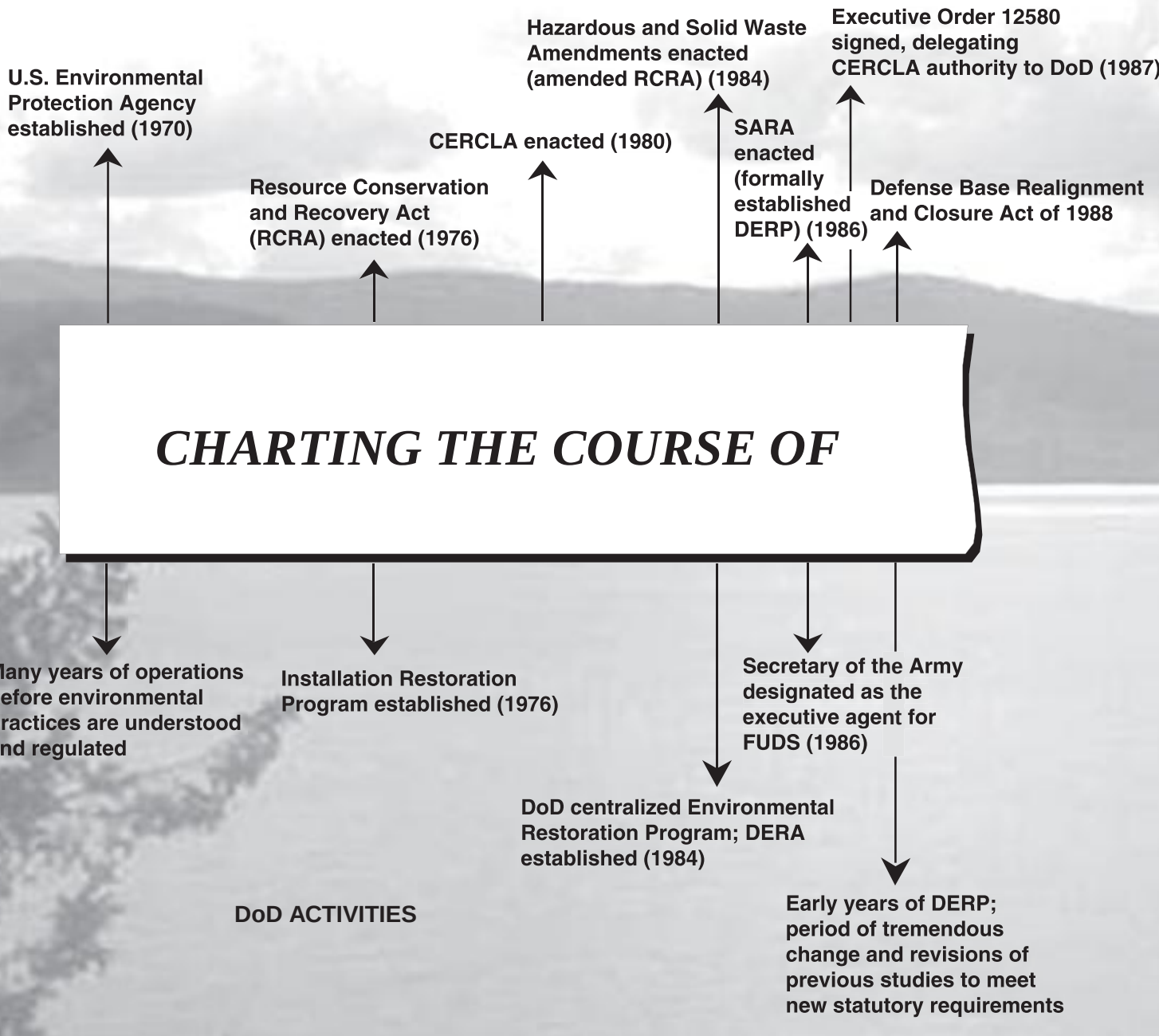
Aerial photo of the tank farm area on Amaknak.

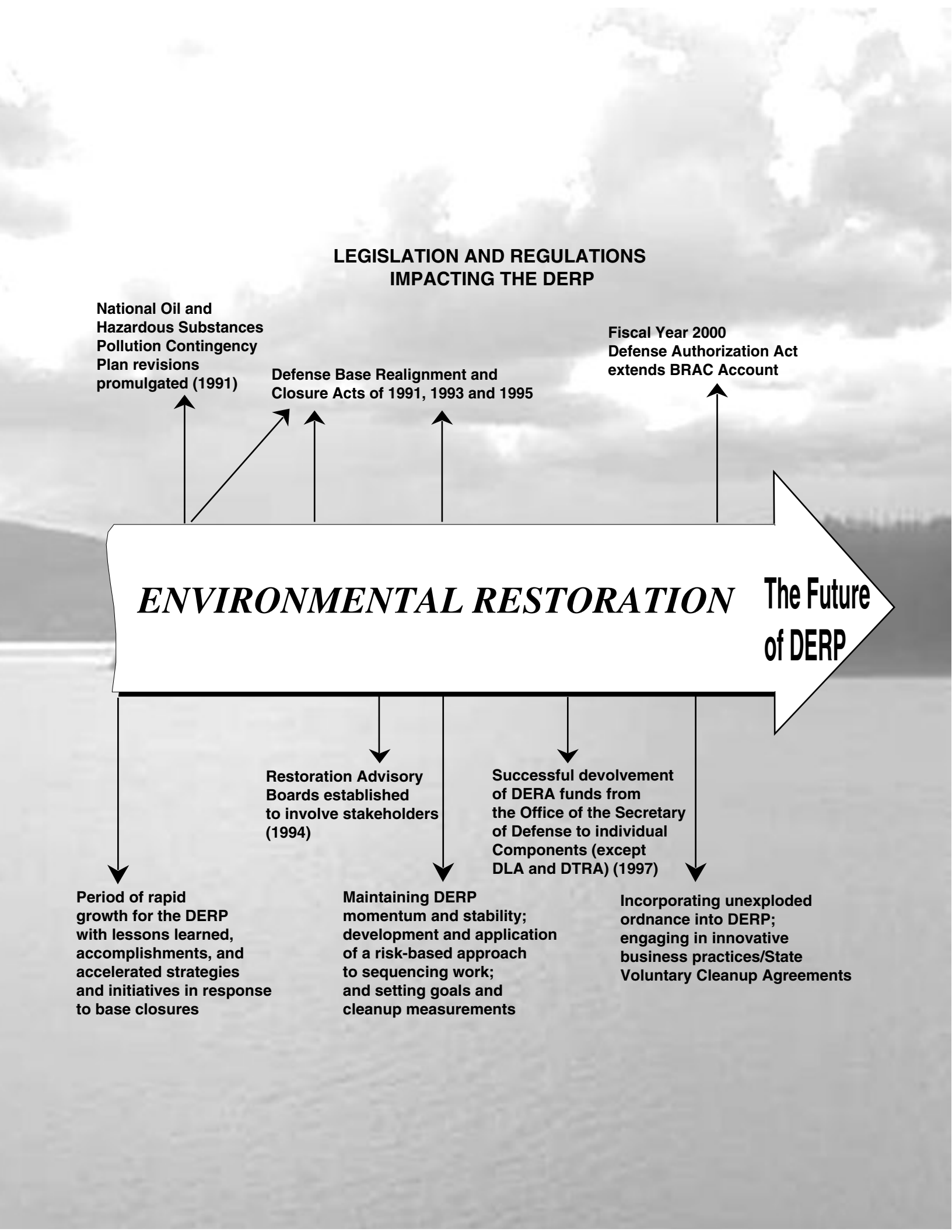
Based on a treatability study that considered both technical viability and cost, the U.S. Army Corps of Engineers began treating approximately 12,500 cubic yards of contaminated soil with hot-air vapor extraction (HAVE). This technology injects high-temperature air (900 to 1,000 degrees Fahrenheit) into an enclosed treatment stack via perforated piping. The contamination is driven off the soil, extracted out of the stack, and treated. Stack emissions meet all regulatory requirements.

With HAVE technology, USACE treats the soil on site, eliminating the need to transport contaminated soil to another location for treatment. In addition, the HAVE technology's impact on the surrounding community is minimal, because the system operates quietly and little heavy equipment is used on or around the site, minimizing noise, dust, and traffic. Finally, HAVE technology costs approximately $800,000 less at this site than the conventional thermal desorption treatment technology.

In addition to implementing this new treatment, USACE has instituted cost-saving measures, including sharing management and resources with other FUDS properties in the area. USACE also has incorporated the tank farm area into an ongoing community relations program at Dutch Harbor for other FUDS work. Activities include quarterly public meetings and biweekly conference calls with local community stakeholders and the City of Unalaska, as well as state regulators. These activities have involved local stakeholders in all decisions made for this site and others in the Dutch Harbor area, giving the community a voice in issues regarding the status of cleanup projects.

Figure 1
History of the DERP




LEGISLATION AND REGULATIONS
IMPACTING THE DERP
National Oil and Hazardous Substances Pollution Contingency Plan revisions promulgated (1991)
Defense Base Realignment and Closure Acts of 1991, 1993 and 1995
Fiscal Year 2000 Defense Authorization Act extends BRAC Account
ENVIRONMENTAL RESTORATION
The Future of DERP
Restoration Advisory Boards established to involve stakeholders (1994)
Successful devolvement of DERA funds from the Office of the Secretary of Defense to individual Components (except DLA and DTRA) (1997)
Period of rapid growth for the DERP with lessons learned, accomplishments, and accelerated strategies and initiatives in response to base closures
Maintaining DERP momentum and stability; development and application of a risk-based approach to sequencing work; and setting goals and cleanup measurements
Incorporating unexploded ordnance into DERP; engaging in innovative business practices/State Voluntary Cleanup Agreements

GOOD NEWS From the Field:

Team Seeks Ways of Improving Cleanup at Air Force Plant 44

A team of engineers and scientists is taking an in-depth look at environmental cleanup technologies operating at Air Force Plant 44 in Tucson, Arizona, to find new ways of cutting costs and optimizing the treatment systems.

Air Force Plant 44 engineer, John Adams, takes a soil sample at the Ranch Site to determine the level of contamination in the soil.

The Tucson cleanup technologies are part of the Remedial Action Operation Optimization initiative, managed by the Air Force Center for Environmental Excellence (AFCEE). Air Force Plant 44, a government-owned, contractor-operated facility managed by the Aeronautical Systems Center, is one of a handful of installations within the Air Force Materiel Command selected for the pilot study. "We are looking at the long-term operation of these systems to determine the best options for reducing costs while enhancing cleanup efficiencies," said John Matthews, AFCEE lead project engineer.

Funded by the Air Force Materiel Command, the $230,000, three-phase project involves evaluating the performance of existing equipment, including determining whether cleanup goals are being met, conducting a scientific study of selected cleanup sites, and implementing recommended modifications to the systems. According to Matthews, two recommended changes at Air Force Plant 44 are scaling down groundwater and soil treatment equipment or altering the treatment scheme.

In September 2000, the team conducted a scoping visit to Air Force Plant 44 to identify opportunities and sites where cleanup efforts could be improved. Based on that assessment, engineers recommended six cleanup sites for improvement. Soil vapor extraction systems are actively removing chemical solvents and other contaminants from the soil at these sites. These systems remove the contaminants by using a complex network of soil vapor extraction wells and carbon filters.

Another system recommended for study is the groundwater treatment plant, which has been in operation since 1987, removing primarily trichloroethene, or TCE, from a groundwater contaminant plume. This plant has treated more than 18 billion gallons of groundwater to date, and Air Force engineers estimate it could be in operation beyond 2020. "Considering the age of the plant and the projected time we'll be operating the system, we need to find viable ways to cut costs and ensure the groundwater treatment plant will continue to remove the TCE at a reasonable rate," explained Dennis Scott, integrated product team lead. "We won't know how or if the systems will be modified until the study is complete and the team has given us its recommendations."

During the second phase of the project, scheduled to begin in November, Scott will work with the U.S. Environmental Protection Agency and the Arizona Department of Environmental Quality to select the sites that will be included in the study. "From what I've learned so far, we'll probably concentrate on the groundwater treatment plant. This could include trying some new groundwater sampling techniques and doing groundwater modeling to evaluate different pumping strategies," Scott said.

A final report outlining all of the recommendations and proposed modifications to the systems is due out in October 2001.

N

Using Innovation to Map the Future

As the DERP moves further down the road toward completion, DoD continues to encounter new issues and challenges. In response, DoD seeks to incorporate innovative tools and techniques that are emerging in the public and private sectors into its cleanup program. Innovation is vital to the DERP's success—DoD is working to facilitate the cleanup process, incorporate regulator and public input, and complete environmental restoration program requirements. DoD is mapping the future of the environmental restoration program by—

- Collecting and disseminating best practices to move the environmental restoration process forward
- Embracing stakeholder involvement and new partnerships to streamline the cleanup process and improve decision making
- Promoting greater understanding of the environmental restoration process and programs to increase transparency to DoD stakeholders
- Developing new policies and guidance to address complex issues
- Incorporating new contracting and technological tools to expedite cleanup and facilitate property transfer.

Each of these measures is described in the remainder of this chapter.

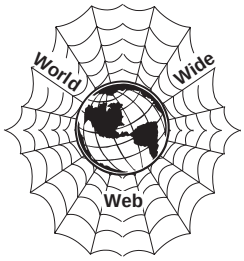
The Office of the Secretary of Defense collaborates with the Components to develop and implement innovative tools that support successful program execution.

Best Practices Move the DERP Forward

As its environmental restoration program matures, DoD is implementing the program improvements and process enhancements that best serve the needs of installations, communities, federal and state agencies, and other DERP stakeholders. In Fiscal Year 2000 (FY00), DoD sponsored several initiatives to give DERP stakeholders a forum for sharing, collecting, and describing the challenges and opportunities they have faced in closing bases, cleaning up past contamination, and redeveloping properties. By collecting and disseminating these best practices, DoD is leveraging current knowledge and maximizing resources.

In November 1999, the Office of the Secretary of Defense, Cleanup conducted a Cleanup Program Review—a forum for selected military installations and former properties to provide insight on program progress and barriers. Unlike other program oversight mechanisms, which focus on

Cleanup Program Review Best Practices Report



http://www.denix.osd.mil/denix/Public/ES-Programs/Cleanup/BP/cpr-bestpracticesreport.pdf

detecting and resolving specific programmatic issues, the Cleanup Program Review sought to identify ways in which individual military installations and properties have been successful in overcoming cleanup challenges.

Installation personnel identified to senior DoD officials the issues that continue to impede environmental restoration progress and suggested ways of improving environmental restoration performance. The goal of this roundtable discussion was for senior DoD officials to hear how barriers were overcome. To capture the participating installations' program successes, DoD prepared the *Cleanup Program Review Best Practices Report.* This report describes how various installations addressed program challenges through the use of existing and innovative tools. A summary of the DoD installation and property best practices that were captured at the Cleanup Program Review is provided below.

Hallmarks of an Ideal Installation's Environmental Restoration Activities

- DoD cleanup personnel and regulators work from the same plan describing the strategy for cleanup and the extent of cleanup required, and agree on how business will be completed.
- DoD cleanup staff maintain open channels of communication.
- Regulators are involved early and continually throughout the process.
- Stakeholders are involved throughout the cleanup process at the installation and are consulted by DoD cleanup personnel.
- DoD leads the partnering process and the cleanup team at installations.
- DoD cleanup staff and stakeholders agree early and consistently on the regulatory program, process, and standards to be used throughout cleanup at the installation.
- Project management practices at the installation level focus on effective contracting strategies, cost savings, compliance with schedules, and reliable cleanup projections.
- Remedial project managers and other on-site cleanup personnel are qualified, and there are sufficient staff to get the job done.
- DoD cleanup personnel use streamlined procedures for decision documents, such as Records of Decision.
- DoD cleanup personnel use expedited remediation approaches (e.g., interim remedial actions and removal actions, presumptive remedies, and innovative technologies) in managing cleanup.

Stakeholder Involvement and Partnerships Streamline the Cleanup Process and Improve Decision Making

DoD is responsible for and committed to protection of human health and the environment through cleanup at its installations and properties. But the Department needs assistance. DoD actively involves local communities, tribes, and government agencies in its cleanup efforts. Through open communication and cooperation with regulators, DoD works to expedite the cleanup process and ensure that human health and the environment are protected. Additionally, DoD established the Restoration Advisory Board (RAB) program to incorporate community participation into the DERP. DoD believes the hallmarks of successful partnering are trust, open communication, positive leadership, and commitment to process improvement. The Department has worked diligently to promote these elements in all areas of the DERP.

Expediting Cleanup through Partnering with States

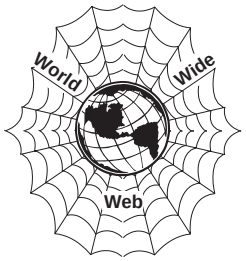
Agreeing to expedite the cleanup process, improve partnering and communication, and cut red tape, the Department of Defense and the New Jersey Department of Environmental Protection (NJDEP) signed a joint voluntary cleanup agreement in August 2000.

Voluntary cleanup agreements are tools commonly used by state environmental agencies to facilitate private-party cleanup of contaminated properties. Federal agencies have not used this mechanism. Continuing to break new ground, the DoD–New Jersey agreement is the second signed between a state and the Department of Defense. DoD forged its first voluntary cleanup agreement of this type with the Commonwealth of Pennsylvania in July 1998.

Voluntary cleanup agreements allow DoD and states to build on and improve the process that has already been established through the DERP. Each agreement has the same intent—to effectively and safely clean up military sites and return them to productive use. Each agreement, however, is uniquely designed to comply with a state's laws and regulations, and to meet each state's particular concerns.

DoD and the NJDEP expect to save time and resources by promoting partnerships, better communication and planning, common standards, and the use of innovative technologies. Not all DoD sites in New Jersey are covered by the agreement (for instance, those on the U.S. Environmental Protection Agency's (EPA's) National Priorities List (NPL) are not covered).

DoD Voluntary Cleanup Agreements



http://www.denix.osd.mil/denix/Public/Library/Cleanup/VCA/NJ/vca-final.html

GOOD NEWS From the Field:

Innovative Treatment Solution Yields Safety, Savings, and Beauty

Established in 1913, the Naval Undersea Warfare Center (NUWC) in Keyport, Washington, routinely performs maintenance and repair work on underwater weapons. Now the facility is extending its ingenuity to battling groundwater contamination on its property by using an innovative treatment technology.

Like many other military installations, NUWC Keyport has a landfill on site. This landfill has contaminated groundwater with volatile organic compounds (VOCs), which could migrate off the property if not controlled.

Traditional control methods involve pumping out the groundwater and treating it to remove contaminants. The Keyport RAB, composed of Navy, community, federal, tribal, and state representatives, suggested that the Navy try something different: phytoremediation.

Phytoremediation involves using plants to do the cleanup work by drawing contaminated groundwater up through their roots and converting the contaminants to nontoxic constituents. The Navy liked the idea and decided to use the method as part of the remedy for VOC contamination at the landfill.

Planting hybrid poplars produced an efficient natural cleanser for contaminants.

The Navy's plan called for planting 1,000 trees over two 1-acre hot spots of groundwater contamination. The type of hybrid poplar selected is ideal for this kind of project. Each tree, once fully grown, can draw up to 30 gallons of groundwater per day and naturally convert the contaminants into nontoxic substances.

The phytoremediation project also involved removal and recycling of 694 tons of asphalt that had served as pavement over the landfill. In addition, the Navy installed monitoring wells and instrumentation, tilled the soil exposed by the asphalt removal, and covered the exposed area with planting soil.

In phytoremediation, the depth of the roots is more important than the height of the tree. The roots of the poplars planted at NUWC Division Keyport have not yet reached the water table, so they have not started drawing out the VOC-laden groundwater from beneath the site. The Navy expects the poplars to start doing their job in summer 2001, when their roots reach the groundwater. A long-term monitoring program will track the progress and effectiveness of this natural cleaning process.

The cost of the project is estimated to be $1.5 million, including 5 years of operation and maintenance. The alternative—installing a conventional pump-and-treat system with wells, pumps, piping, and monitoring equipment—was estimated to cost up to $10 million. An added advantage of using the phytoremediation technology is that the choice acknowledges the advice and contribution of the installation's RAB, nurturing a valuable partnership.

N

NJDEP Commissioner Robert Shinn said about the agreement, "The state and the communities that surround these sites will benefit from having a known plan for addressing future assessments and cleanups. The NJDEP and the military will be better able to manage time and budgets for the projects, and the communities will enjoy sites that can be returned to productive use."

Partnering with States through DSMOA

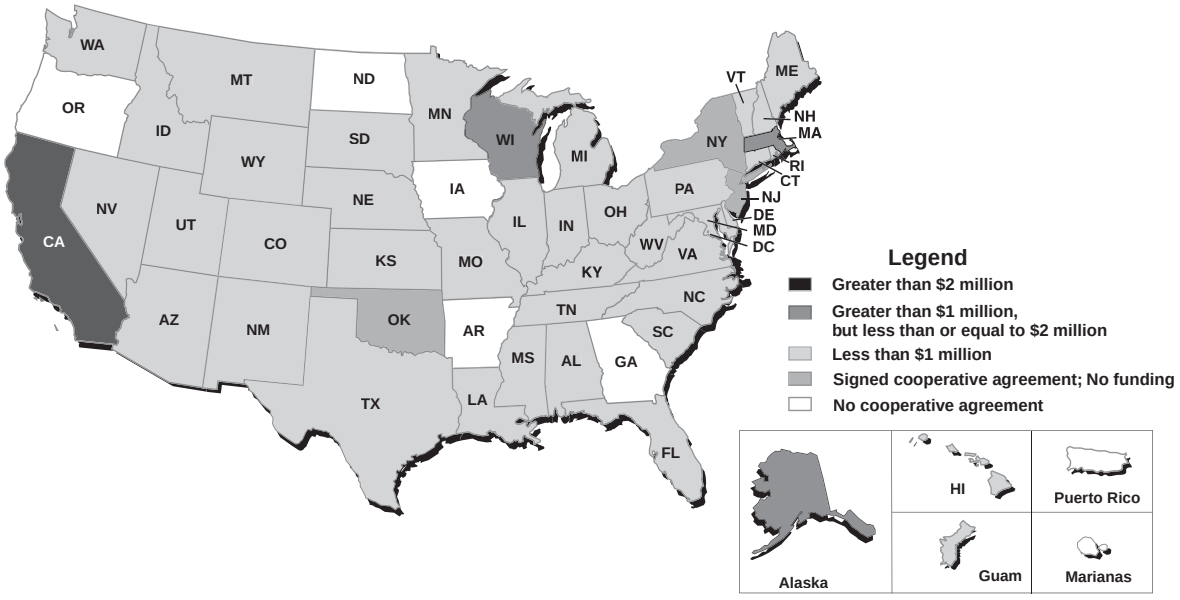
Through the Defense and State Memorandum of Agreement (DSMOA) program, DoD provides states and territories with funding to reimburse their contributions to the DERP at its installations and properties. As of September 30, 2000, DoD had signed 51 DSMOAs with 46 states, 4 territories, and the District of Columbia.

After a DSMOA is established, DoD and the state sign a two-year cooperative agreement that outlines remediation activities planned at an installation and the reimbursement process. DSMOA reimbursements by state are shown in Figure 2. During FY00, DoD reimbursed almost $26.8 million to states for their regulatory review services, such as

DSMOA Program

http://hq.environmental.usace.army.mil/programs/dsmoa/dsmoa.html

Figure 2
DSMOA Reimbursements in FY00



Note: Figure 2 represents actual reimbursements paid through the DSMOA program. It does not represent obligated funds (funds set aside for a state that are not yet distributed).

document reviews, site visits, and community education efforts. Additional information on DSMOA and cooperative agreements is provided in Appendix C of this report.

We are extremely proud of the progress we have made in partnering with federally recognized tribes.

Partnering with Tribal Governments through Cooperative Agreements

Central to our efforts to address environmental impacts on Indian lands are the collaborative relationships DoD is building with American Indians and Alaska Natives. DoD has engaged in operations, training, and testing throughout the United States, and inevitably, some of these activities have impacted Indian lands. We are addressing those issues attributable to past DoD activities in a manner that is consistent with the principles of tribal sovereignty outlined in the DoD American Indian and Alaska Native Policy.

DoD uses cooperative agreements with tribal governments as a partnering tool to take advantage of tribal expertise and traditional cultural knowledge concerning environmental restoration activities. These agreements allow DoD to provide funding to tribes for services; to provide tribes with a greater say in, and responsibility for, DoD environmental projects that may affect tribal lands and resources; and to fulfill DoD's commitment to respecting tribal sovereignty and working with tribes on a government-to-government basis.

In FY00, DoD entered into a cooperative agreement with the Suquamish Tribe of the Port Madison Indian Reservation, Washington, to address the potential impacts of former military activities on treaty-reserved Tribal resources. Encompassing a significant portion of the Puget Sound, the Suquamish Tribe's adjudicated "usual and accustomed" fishing area includes several DoD sites on the NPL from the Puget Sound Naval Shipyard, Bremerton, and the Naval Undersea Warfare Center, Keyport. Currently, DoD and other federal agencies are working to clean up these contaminated sites.

In initiating its cleanup efforts, DoD recognized a need for local knowledge to enhance decision making and planning for the Puget Sound's diverse geographic terrain. DoD sought the Suquamish Tribe's expertise to gain a better understanding of the area's ecological and traditional cultural resources. The Tribe's involvement has led to a more efficient and comprehensive review of remediation activities, expediting cleanup while ensuring that the Tribe's treaty resources are restored and protected.

GOOD NEWS From the Field:

Cleanup for Recreational Reuse Begins at NAS Patuxent River

On February 8, 2000, Naval Air Station (NAS) Patuxent River Commanding Officer, Captain Paul Roberts, and U.S. EPA Region 3 Director of Hazardous Site Cleanup, Abraham Ferdas, signed a Record of Decision (ROD) for the Fishing Point and Rifle Range landfills at NAS Patuxent River, Maryland. Captain Roberts and Mr. Ferdas gathered with station environmental personnel, U.S. EPA staff, and community members of the Patuxent River RAB at Fishing Point for a site tour and signing event.

The NAS Patuxent River ROD details the remedial action selected by the Navy and EPA, with the concurrence of the Maryland Department of the Environment, for the cleanup of both landfills. The three agencies worked as a team to develop the cleanup remedy for the site. Community involvement was critical in selecting the final remedy. During a public meeting and public comment period, the community was encouraged to give the Navy feedback about all the cleanup alternatives evaluated. These comments were considered and evaluated before plans were finalized. The responses to comments received during the public comment period are included in the ROD.

Installation restoration program team members review plans for the landfill.

In the spring of 2000, the Navy began constructing the remedy—vegetative soil covers over the two landfills. In contrast with conventional concrete caps, the vegetative soil covers minimize direct human and ecological contact with landfill contents. The remedy also includes stabilization measures along the western shoreline of the Fishing Point landfill to preserve habitat along the shoreline and maintain access to the western beach.

Both of these landfills are in the north-central part of the installation, which is located along the Patuxent River. The Fishing Point landfill consists of 23 acres covered by sparse grasses and small trees. Between 1960 and 1974, it was used for the disposal of liquid and solid wastes generated by the NAS. The Rifle Range landfill consists of about 2 acres. The Navy used it as a disposal site for trash and construction debris from the mid-1950s until 1960.

Navy and U.S. EPA personnel join with community members at Fishing Point.

Fishing Point was once a thriving community gathering spot known for its beach shoreline and recreational activities. Because of beach erosion and environmental problems resulting from the landfill, Fishing Point was closed to the public. The NAS now hopes to resume many of these recreational activities, and the Patuxent Installation Restoration Action Partnering Team has supported the installation's plan for recreational reuses, such as more access roads, parking areas, beach access walkways, and camp site areas.

DoD is working to make the DERP more transparent and more meaningful by looking at how we can reduce costs to ensure more dollars go to active cleanup, promoting innovation, and keeping Congress and other stakeholders informed of progress.

Promoting Understanding Increases Program Transparency and Accountability

One of DoD's major goals for 2000 and beyond is to promote a greater understanding of DoD processes and programs. The environmental restoration program is large and encompasses the cleanup of thousands of very different sites, with varying time scales and participants. Navigating these lengthy and complicated processes can be a challenge. By raising awareness, DoD hopes to make the cleanup program more accountable to Congress and more easily understood by its stakeholders. Accountability and transparency lead to an environmental restoration program that is cost-effective, less bureaucratic, and more responsive to the people the program most affects. To ensure that the DERP is meeting these goals, DoD has engaged in several initiatives to bring stakeholders, regulators, and the Department together. These initiatives include community forums, RABs, and a user-friendly Web site. In addition, DoD has planned an environmental cleanup stakeholders forum in FY01 to enable the public to share environmental restoration experiences and concerns with DoD.

Information Technology and Outreach Efforts Bring DERP Closer to Stakeholders

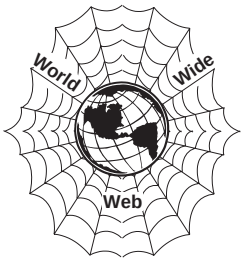
The Internet offers immediate access to an abundance of information from many sources. DoD is working to make the most of this valuable information tool. The Internet brings our program to the public so that stakeholders can increase participation in and understanding of what is happening at installations and in their communities.

For the past several years, DoD has offered this report and many other reports, guidance documents, policies, fact sheets, and newsletters over the Internet. In 2000, DoD expanded its efforts by offering an interactive, queriable DERP Annual Report to Congress for FY99, with geographic information system (GIS) features for its larger installations. These features allow the user to generate custom reports rolled up by state, county, congressional district, and zip code. An example of a GIS query from the FY99 DERP Annual Report is provided in Figure 3.

DoD continues to enhance this effort to provide faster, more user-friendly, and more varied sources of information to its stakeholders. Appendix F of this report provides Internet addresses for numerous DoD, U.S. EPA, and state environmental Web sites.

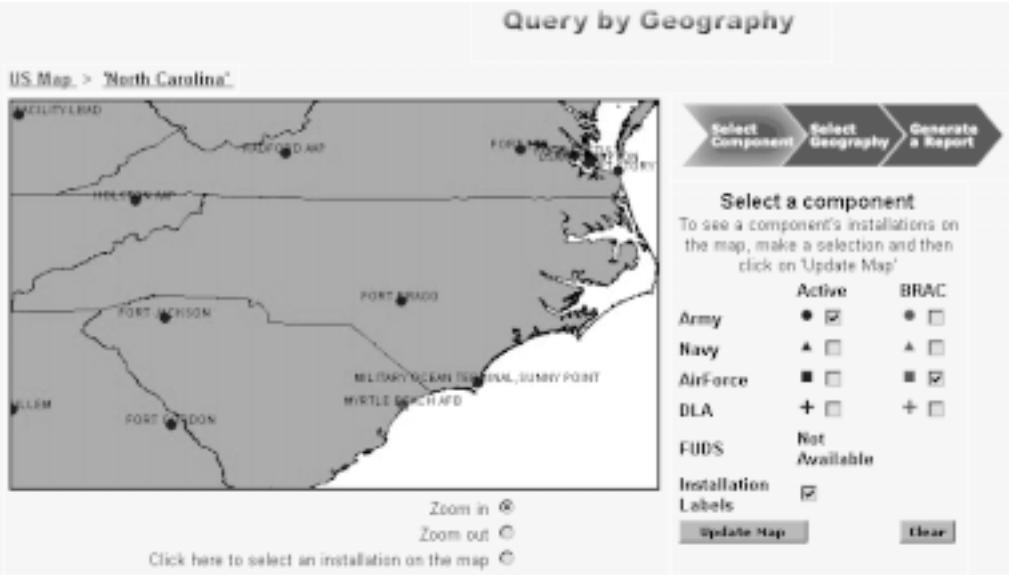
In addition to using technology to share information about the DERP, DoD continues to use traditional outreach and communication outlets, including information repositories at local libraries or installations, educational installation and program fact sheets for communities and RABs, and on-site tours. To increase effectiveness, DoD also communicates with stakeholders in other ways, including providing cleanup information in different languages, sponsoring meetings in the evenings, and posting information in community-oriented locations and outlets such as libraries and local newspapers.

FY99 DERP Annual Report to Congress



http://www.denix.osd.mil/denix/Public/ES-Programs/Cleanup/cleanup.html

Figure 3
FY99 DERP Annual Report GIS Query



RABs Promote Community Involvement in the DERP

Recognizing the importance of community participation in the environmental restoration process at military installations and FUDS properties, DoD created Restoration Advisory Boards (RABs) in 1994. Since then, the Department has established more than 300 RABs in the United States and its territories. RAB members typically are

GOOD NEWS
From the Field:

Fort Sheridan RAB Uses TAPP in Innovative Way

The Restoration Advisory Boards (RABs) at Fort Sheridan, Illinois, used assistance provided through DoD's Technical Assistance for Public Participation (TAPP) program in an innovative way to gain community acceptance on a sensitive environmental restoration project and to generate improved, cost-saving remedial design recommendations on a multi-million dollar project. The RAB's TAPP project focused on cap designs for two Fort Sheridan landfills located adjacent to Lake Michigan, a valuable ecological resource as well as a source of local drinking water.

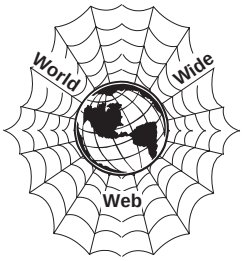
When the Army selected a capping remedy for the two landfills in 1997, there was some community support, but also public opposition. Since then, RAB members had remained uncertain about the protectiveness of the remedy, particularly because a previous cap on one of the landfills had failed. The TAPP program provided an opportunity for the RAB to seek independent assistance to understand the complicated scientific and technical issues related to the remedy, and, as a result, to build confidence that the remedy would be protective of human health and the environment.

The project's success stems from its innovative and cost-effective format. It consisted of a 2-day workshop, modeled after those at participatory planning and design studios typically used by planners and architects. About 25 technical experts participated in the project, representing a cross-section of academics, private consultants, and public agency representatives. The group reviewed and commented on various aspects of the remedial design in an open, productive exchange of ideas aimed at finding the best approach to cap the landfills. Workshop participants and the Army's design consultants discussed the details of site hydrogeology, leachate collection and treatment, and cap design. Ideas generated, such as increased automation, improved drainage, and a reduction in cap height may provide significant cost savings, far exceeding the cost of the workshop.

The detailed discussions built public confidence in the remedy because they enabled people to understand how and why the remedy will work. Additionally, the TAPP project format proved to be a cost-effective way to bring technical experts from a variety of disciplines together to review and comment on the remedial design plans, helping to ensure that remedies are the best they can be. This relatively small investment in a technical assistance workshop can generate potentially large cost savings, enhance public understanding, and ultimately increase support for remedies on sensitive, and even routine, projects.

representatives of the people living or working on the DoD installation or property, the U.S. EPA, state and local governments, tribal governments, and the affected local community. RABs provide all stakeholders with an opportunity to meaningfully participate in the cleanup process and make community views known to the DoD installation decision makers. They also report information back to the community on DoD's environmental restoration projects. Although RABs are not decision-making bodies, they provide important input to the installation commander concerning environmental cleanup at military installations. Additional information on DoD's RAB activities is provided in Appendix G of this report.

DoD RAB Web Site



http://www.dtic.mil/envirodod/rab/index.html

GOOD NEWS
From the Field:

Hill Air Force Base Web Site Provides Another Link to the Community

Hill Air Force Base's Environmental Management Directorate is showing a new face to the public in the form of a Restoration Advisory Board (RAB) site on the Web. The Web site features an easy-access home page, as well as new content previously not available. It is the first time information about Hill's RAB has been available on the Web.

Aside from the new home page, which provides an overview and brief history of the RAB, the highlight of the site is the pertinent information now available to users. For example, anyone with a computer and access to the Internet can learn the date, location, and time of the next RAB meeting; view the agenda for upcoming and previous meetings; review minutes from past meetings; and read about training opportunities.

The site also offers answers to frequently asked questions, information about RAB funding, and a list of helpful links to related Web sites. Another recent addition to the Web site is a list of commonly used environmental terms. The RAB site currently consists of more than 30 individual pages, but that figure is expected to nearly double within 6 months. Future plans call for all environmental-related documents to be included on the site.

A recent survey of local community residents revealed that the Internet is the fourth most popular medium for obtaining information about Hill's cleanup program. Some advantages of communicating information through the Internet include reduced printing costs, timely distribution of information, and convenience in learning about and responding to environmental cleanup issues quickly. In addition, Hill Air Force Base environmental personnel are considering sending e-mail messages to subscribers of *EnviroNews*, Hill's quarterly environmental newsletter, to inform users when the latest edition is posted on the Web site.

You can view the Hill RAB Web site at *http://www.em.hill.af.mil/restoration/rab/index.htm*

DoD is committed to working with all appropriate federal, state, and local agencies and prospective property owners to ensure that land use controls on property being transferred are effective and remain protective.

New Policies and Guidance Address Complex Issues

As new issues come to the forefront in the environmental restoration process, DoD plans for and addresses these challenges by developing new policies and guidance for Components to implement. DoD often works with other agencies, such as U.S. EPA, in developing these policies, which serve to facilitate cleanup and the transfer of property for other uses. The following section discusses recent policy initiatives during FY00.

GOOD NEWS From the Field:

Implementing LUCs at Fort McClellan

Implementing land use controls (LUCs) can help protect the public. To ensure LUCs' effectiveness, an installation or property must have a long-term management strategy in place. Fort McClellan, Alabama, became the first Army BRAC installation to complete such a management strategy: the Fort McClellan Land Use Control Assurance Plan (LUCAP).

Officials signed the LUCAP in December 2000.

This plan was developed in 1999. In April of that year, Fort McClellan personnel began preparing a memorandum of agreement for LUCs in consultation with EPA Region 4 and the Alabama Department of Environmental Management (ADEM).

Bringing all the stakeholders together proved extremely beneficial. The LUCAP was signed in December 2000 after discussions between Fort McClellan, EPA, ADEM, and the Anniston-Calhoun County Joint Powers Authority (the local reuse authority).

The advantage this approach holds for the Army and the local community is that the agreed-upon management process will facilitate land transfers involving LUCs. The LUCAP focuses on the use of LUCs in the CERCLA decision-making process. The LUCAP may also be used in conjunction with other programs, such as the Resource Conservation and Recovery Act and the cleanup of unexploded ordnance, or as needed when LUCs are needed for protection of human or environmental health and safety. LUCs will be documented in a site-specific land use control implementation plan and further integrated into the supporting real estate documents so that long-term LUC management will reduce the risk of future land users overlooking the established LUCs.

Tackling the Land Use Control Challenge

Ensuring that DoD property is environmentally suitable for transfer from military to public use, and efficiently and expeditiously completing needed cleanups are important goals of the environmental restoration program. DoD is exploring various mechanisms that overcome the barriers to property transfer while maintaining crucial protections for human health and the environment. Ways of controlling property use in the future, collectively known as land use controls (LUCs), are one tool DoD is using to better manage land use restrictions and facilitate property transfer.

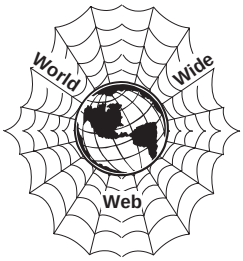
LUCs are physical, legal, or administrative mechanisms that restrict or limit access to contaminated property in order to reduce risk to human health and the environment. Examples of LUCs include:

- Posting signs to warn of the danger associated with a contaminated area or range to discourage unauthorized access to the area
- Legally restricting incompatible land uses through restrictive covenants.

LUCs do permit limited development of a property, but only if the activities are appropriate for the contaminated site.

DoD wants to ensure that LUCs on military properties remain compatible with all future land use decisions. In August 2000, DoD developed the Interim Policy on Land Use Controls Associated with Environmental Restoration Activities. The policy provides a framework for implementing, documenting, and managing LUCs, for both active installations and transferring real property. To make the policy more applicable in the field, DoD developed two guidance documents that provide detailed information on how to implement and manage LUCs. DoD plans to finalize this guidance in FY01.

DoD LUC Policy



https://www.denix.osd.mil/denix/Public/Library/Cleanup/lucpolicyguidance.pdf

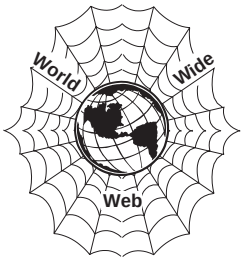
Navy and California Sign Landmark LUC Agreement

In FY00, the U.S. Navy and the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) signed a landmark memorandum of agreement (MOA) on the use of land use controls (LUCs) at closing bases in California. The MOA reinforced the Navy's commitment to ensuring that LUCs stay in place and are honored by all future owners and occupants of the property. The Navy also recognizes the importance of a formal restrictive covenant that is held with the land as it transfers from one owner to another. The Navy and the DTSC both agreed to enforce the LUCs during any property transfer. The MOA between the Navy and DTSC is the first agreement to provide a negotiated framework for establishing long-term enforcement of land use controls at Navy installations.

DoD Lead-Based Paint Policy Protects Public Health

Lead-Based Paint Policy

http://www.dtic.mil/envirodod/brac/DoD_LeadPaintPolMem.pdf



Lead-Based Paint Field Guide

http://www.dtic.mil/envirodod/brac/LeadPaintFieldGuide.pdf

Managing, handling, and disposing of lead-based paint and other lead hazards are of great concern to DoD. Lead was a common ingredient in residential interior and exterior oil-based paints. These paints were widely used in the United States, including DoD installations, until the 1970s when the health hazards posed by lead compounds became widely known. While exposure to lead is a serious threat for all, childhood lead poisoning is a common pediatric health problem. DoD is working diligently to minimize the impact of lead-based paint on children and all people who work and live on DoD installations.

When lead-based paint deteriorates due to age or mechanical forces, lead is released into the environment. The most immediate lead hazards are found in structures with peeling lead paint or excessive levels of lead dust from deteriorating paint. Wooden window areas are often a hazard because the friction of opening and closing the window generates lead dust. Also, if renovations to old structures are not performed correctly, lead dust can spread throughout the structure and the surrounding environment, including surrounding soil. When this occurs, lead can be ingested.

Addressing lead-based paint concerns on BRAC properties has proved to be a challenge for DoD because federal, state, and local environmental laws associated with lead-based paint have often been varied and conflicting, causing delays in the remediation and transfer of these properties for non-DoD use. In January 2000, DoD issued the Lead-Based Paint Policy for Disposal of Residential Real Property to achieve consistency in the application of lead-based paint laws and to reaffirm DoD's commitment to managing lead-based paint in a manner that protects human health and the environment.

In conjunction with this policy, DoD developed a field guide with EPA to provide a general road map for DoD and EPA personnel on how to evaluate and control lead-based paint at DoD residential real property built before 1978. The field guide also identifies DoD policies and procedures that provide protections going beyond the requirements of the federal lead-based paint program. The policies and procedures provide children with additional protection from lead exposure.

New Tools Expedite Cleanup, Property Transfer, and Completion of Program Requirements

Cleaning up contamination from former military activities and putting the sites back to productive use are challenging tasks. New tools and approaches are emerging in the private sector that can streamline the cleanup process and allow cleanup to be better integrated with redevelopment. DoD is seizing these opportunities to improve the cleanup process by using new contracting and technological tools to expedite cleanup, facilitate property transfer, and achieve program completion. These innovations include—

- Integrating processes that allow DoD to transfer cleanup or redevelopment responsibilities to non-DoD parties while retaining ultimate liability for the restoration
- Using innovative mechanisms for contracting with private contractors to provide more accurate estimates of cleanup costs and greater accountability for meeting timelines, protecting the installation from cost overruns
- Promoting the use of environmental insurance, which mitigates the uncertainties associated with contaminated property
- Developing and fostering the use of new technologies to solve the military's unique contamination problems.

These innovative measures continue to refine and improve the DERP. The following examples highlight DoD's initiatives.

DoD/Private Sector Partnership Expedites Redevelopment

DoD has shown that contamination and redevelopment issues can be addressed expeditiously and economically through the private sector. Building on such successes, DoD is partnering with the private sector to pursue cleanup and redevelopment initiatives.

On August 10, 2000, the U.S. Army transferred Joliet Arsenal to CenterPoint Properties Trust, the region's largest owner and developer of industrial properties, for redevelopment. The transfer of ownership created one of the nation's largest private developments. It offers lessons learned about efficiently converting closed military installations to private use and turning potentially negative economic impacts into opportunities for jobs, investment, and tax revenues.

Our focus and our commitment centers on effective cleanups that are faster and better and, for BRAC, support property transfer and reuse.

Formerly used by the Army for munitions manufacturing, the arsenal was designated an NPL site and required environmental remediation before it could be transferred by the Army. The Army completed the cleanup at the site, transferred the property, and supported large-scale redevelopment by providing assurances to future users regarding any known or currently unknown environmental issues.

For local communities, BRAC can mean opportunity for economic diversification and expansion, meeting community and social needs, and protecting our environment.

The project will consist of two phases. The first phase is a $265-million, 600-acre transit and railway facility, which will be operated by the Burlington Northern and Santa Fe Railway Company. The second phase is a 17-million-square-foot distribution and manufacturing space called Deer Run Industrial Park. Eight thousand jobs were lost when the arsenal closed in 1976. Now, the project is expected to create between 8,000 and 12,000 permanent jobs for the surrounding communities, 20,000 union construction jobs, and as much as $27 million in annual property tax revenue.

The landmark agreement was commemorated by an official transfer ceremony. Illinois Governor George H. Ryan remarked, "This project will bring thousands of new jobs to the state and revitalize a large portion of the Joliet Arsenal. It also represents the most ambitious effort ever undertaken to convert a former U.S. military base for private industrial use."

Innovative Fixed-Price Contracting and Environmental Insurance Accelerate Cleanup

Using an innovative contracting and insurance mechanism, the U.S. Navy is accelerating environmental cleanup and transfer of the Charleston Naval Complex (CNC) in South Carolina. In February 2000, the Navy outsourced the CNC cleanup under a fixed-price contract to a private firm, which will take over the cleanup responsibility. The extensive site investigation and characterization conducted at CNC reduced the probability of unknown contamination problems and therefore made a fixed-price contract with insurance plausible.

As specified in the terms of the agreement, the contractor's use of environmental insurance will indemnify or insure the government against any environmental claims. Although *legal* liability under CERCLA and RCRA cannot be transferred, the insurance option allows the Navy to

transfer all or a portion of the *financial* liability to the private contractor and insurer. The contract ensures completion of the cleanup at a fixed cost to the Navy and protects the Navy from liability.

The prevailing philosophy has been that the government must retain all risk and liability as the property owner and permittee. The CNC project, however, has shown that fixed-price contracting and environmental insurance can be effective mechanisms for accomplishing restoration, accelerating property transfer, and reducing cost. It is anticipated that the CNC project will allow—

- The Navy to accrue a 17 percent avoidance in cleanup costs
- The CNC Redevelopment Authority to accelerate the cleanup, which will allow it to meet its goals for long-term property use, creation of new jobs, and new tax revenue
- The insurance policies to protect potential developers from losses caused by unanticipated remediation delays and to encourage quicker conversion of the property to productive reuse
- The community to be guaranteed that, if new contamination is discovered, the situation will be quickly resolved.

The initiative the Navy has taken at CNC illustrates DoD's ongoing commitment to the environment and interest in seeing BRAC facilities quickly returned to positive use.

Technological Tools Address Cleanup Challenges

DoD's technology initiatives have resulted in the development, production, and use of innovative environmental technologies, allowing DoD to address cleanup challenges efficiently, cost-effectively, and safely. Once DoD establishes the need to clean up a site on an installation or former property, it must select a remedy to address risks to human health and the environment. DoD is constantly seeking such new technologies to clean up environmental contamination and enable site restoration to take place faster, with increased effectiveness, and at a lower cost. At the same time, DoD strives to choose the most appropriate and effective remedy for each site and perform cleanups that can achieve the remediation goal for the site. Lessons learned and presumptive remedies are also valuable tools.

To ensure the application of the most effective and appropriate cleanup technologies, the Components identify environmental technology needs by prioritizing the problems identified by the installations. Then the technology is validated for technical soundness and cost feasibility. If no

GOOD NEWS From the Field:

Corps Technology Choice Promotes Army Environmental Stewardship

T-10 Donovan Blast Chamber safely detonates UXO in place.

The U.S. Army Corps of Engineers successfully used a new technology to safely detonate unexploded ordnance (UXO) in-place at two FUDS properties. The new technological device, the T-10 Donovan Blast Chamber, is a transportable and contained detonation chamber that destroys ordnance without causing collateral damage to the environment. USACE personnel used this off-the-shelf, commercially developed technology in a way that promotes environmental stewardship, resulting in a new and better way of performing ordnance disposal.

To use this new technology, USACE personnel place the UXO inside the detonation (blast) chamber after wrapping it in a special material to suppress the energycreated by the detonation. The chamber captures generated particles as small as one-half micron. Gases generated by the blast are filtered through an air pollution control system before being released into the air. The chamber can be used for rapid and repetitive UXO disposal, allowing detonation of munitions equivalent to two 81-millimeter mortar rounds, plus the donor charge used to initiate detonation, every 5 minutes.

This environmentally safe cleanup alternative has several advantages over the traditional open burn and open detonation methods. The chamber—

- Reduces movement and handling of munitions
- Eliminates residues that could contaminate soil and groundwater
- Reduces noise to acceptable industrial standards
- Eliminates shock waves that could disturb nearby populated areas.

In addition, the chamber can be operated 24 hours a day in any weather, thereby decreasing costs through increased productivity.

This technology is now in use at the St. Louis Downtown Site in St. Louis, Missouri, and at Camp Edwards on the Massachusetts Military Reservation on Cape Cod, Massachusetts. The St. Louis property contained ordnance dating back to the Civil War. Rather than trying to transport this ordnance from a crowded urban area, USACE decided to use the chamber for safe and immediate on-site disposal of the potentially unstable munitions. At the Massachusetts Military Reservation property, there was concern that explosives residue could contaminate the underlying groundwater. The Donovan Chamber solved this disposal problem by controlling any unexploded waste products generated by the demolition.

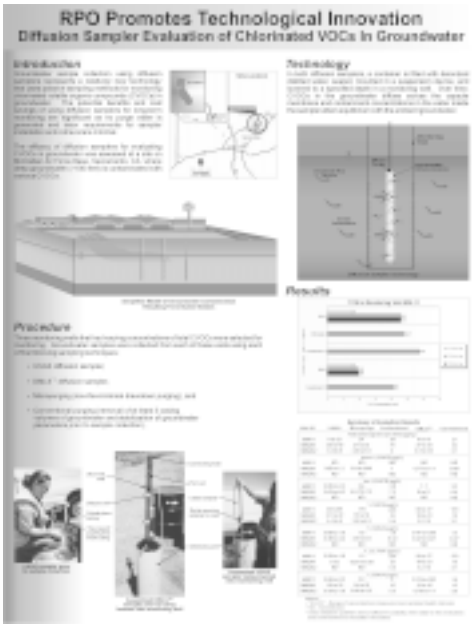
USACE's experience at these two properties illustrates the environmental, safety, and cost benefits of this technology. These advantages may also be applicable at other sites.

technology exists to meet a particular cleanup need, the potential solution becomes a candidate for research and development. DoD then works with the science and technology community to develop projects and program proposals based on the prioritized list of technology requirements.

GOOD NEWS From the Field:

McClellan Air Force Base Uses Simple Methods to Evaluate Contaminated Groundwater

At McClellan Air Force Base in Sacramento, California, scientists are using an innovative technology to collect samples of contaminated groundwater more than 100 feet below the surface. This technology, called diffusion sampling, uses passive sampling methods to monitor contaminants in groundwater. Traditional, more active, sampling methods (such as bailers and pumps) can create too much disturbance in the water, rendering the sample inaccurate.



An illustration of how diffusion sampling works.

Traditional sampling methods are also labor-intensive—requiring sending two or three workers to a monitoring well, setting up pumps, removing water from the well, taking several samples from that water, labeling and handling the samples, icing the samples down, and shipping the samples to a laboratory for testing. With the use of a diffusion sampler, one person inserts a bag into the sampling well. Over time, contaminants in the groundwater migrate across the container's membrane, and contaminant concentrations in the water inside the sampler become equal to those in the groundwater in the monitoring well. Once equilibrium has occurred, the bag is removed and sent to a laboratory for analysis.

The potential benefits and cost savings from using diffusion samplers for long-term monitoring are significant, since no purge water (water drawn from an aquifer or well for testing) is generated and labor requirements for sampler installation and retrieval are minimal. The absence of purge water eliminates problems associated with that water's disposal. In addition, one person can conduct several tests in a day using a diffusion sampler, while it may take several people two or more days to conduct one test using traditional sampling methods. The Air Force Base Conversion Agency hopes to implement this sampling procedure at other installations in the near future.

To address its technology needs, DoD also works with other federal agencies through interagency groups, such as the Strategic Environmental Research and Development Program (SERDP), to research and assess development of new technologies. SERDP is DoD's corporate environmental research and development program, planned and executed in full partnership with the Department of Energy and U.S. EPA. This program is charged with identifying, developing, and implementing environmental technologies that minimize or eliminate environmental impacts during DoD operations and training. SERDP has been successful in leveraging private and federal initiatives and resources to meet environmental remediation challenges.

As new technologies move toward use in the field, DoD uses demonstration and validation programs, such as the Environmental Security Technology Certification Program (ESTCP), to test and certify them. ESTCP has been instrumental in advancing innovative technologies that target DoD's most pressing environmental needs.

DoD is committed to environmental restoration at its installations and former properties. The best practices collected and disseminated through the cleanup program have helped DoD installations move the environmental restoration process forward. DoD's involvement with stakeholders and the formation of new partnerships have streamlined the cleanup process and improved decision making. DoD is increasing program transparency and accountability through information technology and outreach, promoting greater stakeholder understanding of the DERP. DoD is also using new mechanisms to expedite cleanup and facilitate property transfer. DoD has used these innovations to chart a successful course for the DERP and ensure that DoD meets its commitment to completing program requirements.