

**RECORD VERSION**



**STATEMENT BY**

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**OASA (IE)**

**before the**

**SENATE ARMED SERVICES COMMITTEE**

**SUBCOMMITTEE ON READINESS**

**UNITED STATES SENATE**

**106TH CONGRESS**

**regarding**

**THE ARMY ENVIRONMENTAL PROGRAM**

**April 13, 1999**

## OVERVIEW

Mr. Chairman and Members of the Committee:

It is a pleasure to come before the Subcommittee today to discuss the Army Environmental Program. My testimony will describe how we integrate environmental considerations and technology solutions into base operations, acquisition, logistics, and training to support the Army's ground forces and warfighting mission – it describes what we have accomplished and how we intend to improve our program to support the Army of the future.

### **The Army's Environmental Vision and Mission**

#### **The Vision:**

The Army will integrate environmental values into its Mission to sustain readiness, improve the soldier's quality of life, strengthen community relationships, and provide sound stewardship of resources.

#### **The Mission:**

The Army will develop and implement cost-effective measures to protect and sustain the environment in support of the military operations, installation management, and materiel development.

### **The Army Environmental Commitment.**

The Army Environmental Program supports readiness and improves the quality of life for our soldiers and their families. It fulfills the public trust to manage Army lands by protecting natural and cultural resources in accordance with Federal, state, and local laws. The Army is fully committed to complying with laws and regulations, and

conserving natural and cultural resources, and to clean up “active sites” and closing bases. To accomplish this, we are continuing to integrate pollution prevention practices into all that we do, and expand the focus of our technology program to comprehensively address environment, safety and health needs to cost effectively achieve these goals.

By dedicating our efforts to these activities, we will become increasingly successful in identifying efficiencies to support the Army’s core business practices; developing creative solutions to environmental stewardship; protecting soldier, civilian and community health and safety; and in helping to fulfill the Army’s commitment to support and execute the National Military Strategy.

### **Mission Essential Support.**

Readiness. The readiness of America’s soldiers demands sound environmental management to protect the land entrusted to the Army. In no other military services’ mission is success so closely linked to the land. The Army must provide our soldiers with tough, realistic, battle-focused training in preparation for a wide variety of mission essential warfighting scenarios ranging from tropical, desert, to cold region operations. Ensuring our soldiers have access to the most realistic training possible is a challenge for both our operations and environmental communities. Our environmental programs help support this core mission by conserving training lands, preventing pollution, complying with laws and regulations, partnering with local communities, and cleaning up contamination at Army installations.

In fact, one of the primary concerns of this hearing involves the renewal of three Army ranges withdrawn under Public Law 99-606. These major Army training ranges, two in Alaska (Fort Wainwright and Fort Greely) and one in New Mexico (McGregor Range, part of Fort Bliss, Texas) – represent 12 percent of the Army’s total training capacity, nearly 1,500,000 acres. All of these ranges not only provide the ability to train in different types of climates, but also maintain the capacity for current and future weapon systems training and testing which can not be duplicated anywhere else. The

Army's conservation program has been collaborating with the Bureau of Land Management to help manage those lands. It is through our conservation and partnering efforts that we are able to sustain training lands, preserve the environment for future generations, and provide the kind of realistic landscape required for "train-as-we-fight" maneuvers.

Force Modernization. Modernization is essential for the Army to continue to meet the needs of the National Military Strategy. Being ready to fight and win our nation's wars at affordable cost with the fewest casualties remains our foremost responsibility and the prime consideration for Army modernization. The Army continues to search for ways to reduce total ownership costs of weapons systems that will be in service for decades. To help achieve this, we are addressing impacts to human health and the environment in the planning, design, production, operation and disposal phases. Through the use of new technologies and material substitution, we intend to reduce the generation of wastes and minimize pollution throughout all phases of the acquisition process from the earliest concept development through final disposal. Life-cycle environmental analysis, compliance with the National Environmental Policy Act, and an aggressive pursuit of opportunities to further our efforts to integrate and institutionalize pollution prevention into the Army's acquisition program represent just a few examples of environmental support to force modernization, acquisition and material development.

Base Operations. Quality of life is one of the most important factors in recruiting new soldiers and for our current soldiers' decisions to re-enlist. Our Army family deserves a good quality of life and our environmental programs on Army installations worldwide support this important goal. Through Base Operations, we assist in making military communities safe and desirable places to live which indirectly supports the execution of training and directly effects the quality of life we can provide to our soldiers. Army environmental programs are vital to improving quality of life for thousands of soldiers and their families, Army civilians, and our neighbors in surrounding communities. Clean air, clean water, and a healthy natural environment are key to a good quality of life. Our Army installations often have high quality natural habitats that

are large, undeveloped parcels of land that not only harbor diverse wildlife populations, but also provide a wide variety of recreational opportunities for our soldiers, families and local communities.

Environmental management on our installations is a big job. As an example, the Army manages 14.1 million acres of land, processes 1.7 million tons of solid waste and 55 billion gallons of sewage on an annual basis, protects 175 endangered species on 91 installations, and maintains 12,000 historic buildings and 50,000 archeological sites. Army environmental professionals support our installation commanders in fulfilling their base operations requirements by helping to oversee all of these areas, and more, while fully complying with the wide variety of Federal, state, and local regulations and laws.

### **Improved Business Practices.**

The Army has been making great progress in increasing the effectiveness of its business processes. We continue to implement proven management practices and seek new techniques to improve our business approaches in managing our overall environmental program. One particular business improvement is how we manage our environmental technology program; a program that will lead us into the next century as we continually seek management and process improvements.

We are proud of recent developments in our Environmental Quality Technology program, a new corporate approach to manage our environmental technology base via a senior leadership council, that is representative of the Total Army, and whose focus is high priority research, development, testing and evaluation (RDT&E) requirements developed from the bottom up by the user community. The result is a balanced growth in our engineering and scientific knowledge base, with innovative technologies ushering the era of comprehensive solutions to our environmental responsibilities, and curtailing the cost of our future environmental stewardship.

In addition, we are exploring how to better use environmental management systems adopted from the private sector, leveraging industry capabilities. Like industry, we strive to go beyond performance reporting and target the root causes to achieve greater efficiency and effectiveness in program management. By evaluating core management process improvements, we expect to reap benefits through reduced environmental and health risks, improved regulatory compliance and pollution prevention, enhanced stewardship of natural and cultural resources, and cost containment or avoidance.

We are also achieving success in our cleanup program. The Army is evolving towards a results-oriented restoration program with increased efficiency so that we can accelerate cleanup consistent with planned investment levels. We want to meet Defense planning goals and close out sites, reducing the Army's liability and freeing resources for warfighting and modernization. Key mechanisms for achieving this efficiency are use of competition, outsourcing, privatization, and partnering with Federal and state regulators and local communities. On June 26, 1998, the Secretary of Defense recognized the Army's effort in achieving these goals at the largest DOD cleanup site, Army Rocky Mountain Arsenal, Colorado.

### **The Army's FY 2000 Budget Request.**

The Army is committed to keeping its environmental programs tightly focused and responsive to national policy and law. The Army program is directed at supporting the warfighting and other specialized missions by enhancing the training environment, removing environmental threats to soldier health at home and on the battlefield, removing compliance distractions from commander's shoulders and fostering continued national support for an environmentally attuned Army.

We are further determined to accomplish our environmental program tasks with effectiveness and resource efficiency. Restoration and compliance still require the majority of our budget dollars. Programs in conservation, pollution prevention, and

innovative technology provide venues for primary investments to reduce future compliance and restoration requirements; recapturing dollars for the Army's core missions. In addition, and important to this year's budget, there is a new category for unexploded ordnance (UXO) to address concerns at closed training ranges on active installations. Overall, our fiscal year (FY) 00 budget request below provides for a lean, but effective program implementation and investment in both corrective and preventive actions to continue eliminating past problems and preventing future ones.

**Army Environmental Budget (\$Millions)**

	<b>FY98 Actual</b>	<b>FY99 Current Est.</b>	<b>FY00 Request</b>
Compliance	559	531	494
Environmental Restoration, Army	375	370	378
BRAC-Environment <sup>(a)</sup>	199	236	<sup>(c)</sup> 85
DOD FUDS <sup>(a)</sup>	<sup>(b)</sup> 242	<sup>(b)</sup> 225	199
UXO	0	0	10
Conservation	62	54	55
Pollution Prevention	86	77	61
Technology	<sup>(b)</sup> 69	<sup>(b)</sup> 79	28
<b>Total (rounded)</b>	1,592	1,572	1,310

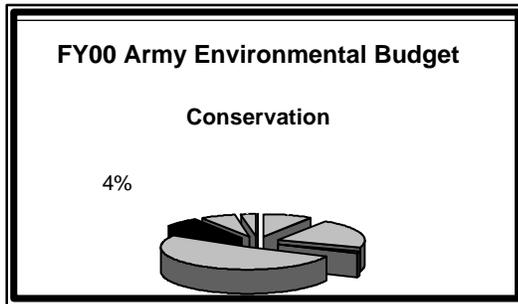
(a) Separate appropriation.

(b) Amounts include Congressionally directed additions to Army budget request --

FUDS, \$40 in FY98 and \$30 in FY99; Technology, \$41 in FY98 and \$51 in FY99

(c) \$85 million of the \$261 million authorized is requested in FY00. The balance will be requested in FY01.

## CONSERVATION



The FY00 budget request of \$55 million (4 percent of the Army's environmental budget) will allow the Army to continue to execute its conservation programs by developing land

resource information, integrating environmental land management throughout Army operations, developing viable management plans, and fostering partnering efforts to leverage available funds. These programs continue to improve our business practices and maximize the return on our conservation dollars. Though lower than the past two years, the funding levels allow for the preparation of integrated natural and cultural resources management plans and continued compliance with threatened and endangered (T&E) species, wetlands, and historic properties.

### **Land Withdrawal Agreements for Training Ranges.**

As was mentioned in the introduction, three ranges, Forts Wainwright and Greely in Alaska, and McGregor at Fort Bliss, Texas, are near the end of their 15-year withdrawal period in 2001. Renewal of these ranges, which comprise 12 percent of the Army's total acreage, is of critical importance to the Army for meeting its readiness requirements. It is because of our conservation program that the Army can assert that it has indeed been a good steward of the natural resources while maintaining these training areas.

The Army worked with the Bureau of Land Management (BLM) to carry out stewardship programs at both Alaska locations. Their agreement delineated responsibilities for each member to coordinate the preparation of the Integrated Natural

Resources Plans. On the McGregor range, the Army and BLM jointly manage available grazing lands for cattle in general, and a trophy pronghorn herd in particular.

The Sikes Act Improvement Act (SAIA) further defines DOD's stewardship responsibilities, in the context of the military mission. The Army must now provide for the conservation and rehabilitation of natural resources; sustain multipurpose use of the resources; and grant public access to the extent that safety and security allow. These three installations will require that Integrated Natural Resource Management Plans be prepared in cooperation with the Secretary of the Interior/US Fish and Wildlife Service and that they have mandatory revision cycles. The existing laws outline an appropriate stewardship responsibility that the Army has, and will continue, to support while making these 1.5 million acres available for critical training:

- McGregor supports live firing for Hawk, Patriot, Stinger, and Roland missiles.
- Greely and Wainwright support glacier training; mountaineering; river rafting; mountainous and cold regions weapons and equipment testing; large and medium range weapons, artillery and rocket testing.

These sites cannot be easily or economically duplicated and their loss would jeopardize military readiness. The Army's stewardship in the past decade, coupled with our expanded natural resources management responsibilities under SAIA, will ensure that the Army will effectively carry out its stewardship and military readiness responsibilities.

### **Natural Resources Programs.**

In many cases, increasing development of land adjacent to Army installations has left our training lands as the last "habitat islands" for federally protected species. As this trend continues, Army natural resources managers must provide for the military mission, while acting as stewards for an increasing number of threatened or

endangered plants and animals that are important national resources. The following programs demonstrate the Army's natural resources management approach.

Integrated Natural Resources Management Plans (INRMP). Sound management practices based on good science and technology help the Army avoid future problems and lead to a reduction in costs required for repairing disturbed soil, vegetation, wildlife habitats, and archaeological sites. The SAIA of 1997 requires that by November 2001, installations that require INRMPs will define management goals and identify actions required to achieve stewardship and readiness objectives. The nature of these plans is changing the Army's approach by shifting from a focus on separateness to collaboration and bringing all relevant managers to the table to make planning and management decisions together. Army guidance requires that 184 installations have INRMPs; of these, 30 were already completed in FY98. To provide a better information base for the plans, the Army is conducting planning level surveys of wetlands, T&E species, plant and animal communities, topographic relief, surface water, and soils. Surveys required to complete the plans are complete or in progress at 90 percent of the installations. Completing plans for the remaining installations will be one of our highest priority for the next two years. This effort is funded in the FY00 budget.

Managing Land for Training and Threatened and Endangered (T&E) Species. The Army's integrated approach to T&E species emphasizes maintaining our ability to train to standard while complying with T&E requirements. Restrictions on soldier training at Fort Bragg, and other installations with red-cockaded woodpecker (RCW) habitats have been greatly reduced as a result of the Armywide RCW Management Guidelines. Mission compatible RCW management goals were established in the Fort Bragg endangered species management plan to assure that soldiers can train to standard. Fish and Wildlife Service officials recently reviewed the RCW recovery progress on Army land that identified an increase in RCW populations. For example, there was a 4 percent increase in RCW populations at Fort Bragg, North Carolina, an 8 percent increase at Fort Polk, Louisiana, and a 9 percent increase Fort Stewart,

Georgia. At the same time, these Army installations have also experienced a 60 percent increase in available training area; a result of sound science and technology efforts to better define essential RCW habitat and a good working relationship with Fish and Wildlife Service. This good news story tells us that species recovery and Army readiness are compatible goals.

These successes provide more evidence that the standard, single-focused approach to training land management is turning a corner. In the past, these installations segregated T&E species management, revenue-generating programs, and the mission. Land management practices had a single focus: manage for production. Their approach to T&E species was to keep the military activities off of T&E species habitats. Practices at these installations now suggest that we can take a more holistic look at our sustainable resources. The approach to T&E species management can utilize the revenue-generating programs along with directed conservation practices to achieve a multiplicity of readiness, conservation, and compliance goals. Installations are actually producing:

- a better quality landscape by growing long-term, sustainable habitats where T&E species flourish and can accommodate training requirements.
- quality of life benefits, recreation for military families and, when possible, for surrounding communities.
- environmental benefits such as soil erosion and noise control, cleaner air and water.

Ecosystem and Regional Management. Recognizing that natural ecosystems do not respect jurisdictional boundaries and are better managed on a larger scale, the Army has partnered with regional stakeholders to promote a regional ecosystem management focus. The payoff is more efficient management and reduced land use conflicts; and, ultimately, sustainable land management and good stewardship of our resources. Five current examples of programs where the Army partners with other services and federal agencies are:

- Chesapeake Bay
- The Mojave Desert Ecosystem Program /Fort Irwin
- Ecosystem Management in Hawaii/Schofield Barracks
- Alternative Futures Project/Fort Huachuca, AZ (Legacy Funding)
- Southwest Initiative

Pest Management Program. By protecting health, property, and natural resources from pests and associated diseases, this program contributes to readiness and quality of life. At the end of FY98, 85 percent of the active and reserve installations manage their programs using approved pest management plans. The Army's nearly 40 percent reduction in pesticide use is on target to meet DOD's goal to reduce pesticides by 50 percent of the FY93 levels by the end of the decade. In FY99, we will continue to seek alternatives to chemical treatments, (such as innovative biological approaches), increase emphasis on pesticide safety training, and improve mechanisms for contracting with outside service providers.

### **Cultural Resources Programs.**

The spirit and goals of the Army are reflected in its cultural resources. Many of our posts are national treasures. Historic buildings support the Army's mission as post headquarters, soldier housing, and a myriad of other functions, and their architecture and craftsmanship reflect our presence and our institutional self-esteem. Archaeological sites and Native American resources reflect the extensive history of the land on which our installations rest. These resources are managed in a spirit of stewardship that balances the Army mission with the preservation of significant assets. The Army's historic and cultural resources serve as daily reminders to the soldier of the Army's irreplaceable heritage and the Nation's history. The Army is leading the way in cultural resource management, having won the DOD Cultural Resources Awards in both

best installation and individual/team categories for the past two years.

Integrated Cultural Resources Management Plans. Cultural resources management plans, now required by AR 200-4, emphasize an integrated approach to cultural resource compliance, stewardship and support of the mission. Army policy promotes installation management of cultural resources on military installations from a holistic perspective. FY98 data show that we have 179 installations that require these plans. All of these Army installations have either completed or are in the process of completing these documents.

Historic Buildings. The breadth of historic building management for the Army is enormous. The Army now has over 12,000 buildings that are officially designated as historic properties. In the next 30 years, 70,000 additional properties will become eligible for this designation. We are addressing the challenge that comes with owning so many historic buildings with three important strategies: 1) streamlining compliance requirements, 2) preserving buildings that can be used by the Army, and 3) working with communities to explore ways that under-utilized historic properties can be reused as office space or event facilities, thereby, reducing the Army's maintenance burdens while bringing added value to the community. Most recently, the Army has prepared documentation to evaluate historic properties related to the Cold War era, as many of these facilities are now approaching 50 years of age. Some of the most renowned historic Army facilities are those at Fort Monroe, Virginia (neoclassical, 19<sup>th</sup> and early 20<sup>th</sup> century), Fort Sam Houston, Texas (Spanish revival, 19<sup>th</sup> and 20<sup>th</sup> century) and the U.S. Military Academy, New York (gothic revival, 19<sup>th</sup> and 20<sup>th</sup> century).

Archaeological Sites. Over 50,000 sites have been identified on Army lands, ranging from remnants of pre-Columbian human habitation (including Native American burials), to more contemporary historic events such as the early pioneer settlements, to paleontological sites containing fossilized dinosaur remains.

A primary accomplishment in FY98 was drafting the policy and guidelines for the curation of archeological artifacts. Army policy contained in AR 200-4 requires installation commanders to focus on retaining only the most significant archeological artifacts that are collected during archeological site excavation for permanent curation. Several commanders have helped identify a number of public-private partnerships that can help manage the curation responsibilities at their facilities. In FY99, the goal is to obtain cooperative agreements with these partners to transfer artifacts for curation.

Consultation with Indian Tribes. A number of federal laws require the Army to consult with Indian Tribes, Native Hawaiians and Alaska Natives regarding access to sacred sites now on military lands, graves protection and repatriation of human remains, funerary objects and cultural artifacts, and Native American issues on religious freedom. For example, U.S. Army Garrison-Hawaii has made access available to a sacred area known as an "Heiau" to Native Hawaiian groups on Oahu while protecting the confidentiality of the site's location, and integrating this access in a manner that is compatible with the training mission.

The Army is actively fostering better communication with tribal representatives before engaging in activities that may affect Indian Tribes, Alaskan Natives, and Native Hawaiians or cultural resources of interest to these groups. The fourth Army Native Peoples Conference is planned for FY00. This forum provides the opportunity to discuss federal regulations that affect historic properties, transfer of human remains, sacred objects in Army archaeological artifact collections, and access to sacred sites. Past conferences have brought together Army personnel and tribal representatives from all regions of the country.

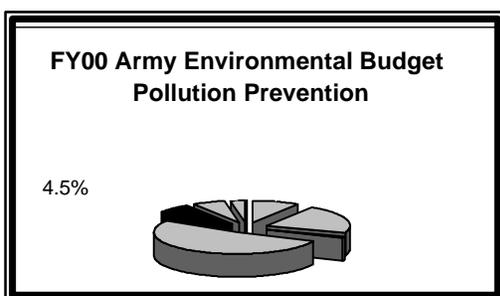
## Conservation Success Stories.

### Conservation Success Stories

Installation	Activities /Successes
Fort Drum, NY	Forest blowdown cleanup --Ice storm damaged 25,000-plus forest acres at Ft. Drum, making soldier training difficult and dangerous. Forest cleanup/salvage is restoring and improving forested training areas (e.g., creating training-needed forest openings.
Camp Blanding, FL	Controlled burns –Summer '98 wildfires caused much greater damage off- than onpost. Blanding's burning regimen reduced fuel loads in training areas, with resulting low loss of structures and available training areas.
Fort Stewart, GA	Fort Stewart forest management provides a training environment where commanders are able to successfully train to standard. The endangered red-cockaded woodpecker is successfully managed which avoids impacts to the mission as a result of compliance issues.
Fort Lee, VA	A program manager partnership with GIS Support Centers, to share GIS data on ranges and T&E species, vegetation cover, hydrology, soils, and many others.  Analysis of current and proposed training facilities resulted in the expansion and construction of training facilities that minimized impacts to the environment and maximized training benefits.
Fort Hood, TX	A program with installation environmental office cleared 13,000+ acres of invasive Ashe Juniper Trees.  The juniper degraded training by limiting laser engagements during non-live fire exercises and degraded wildlife habitat. Managing the Juniper enhanced training and improved wildlife habitat.
Chesapeake Bay Initiative	Volunteers from 18 installations in the watershed planted 4,500 trees to build riparian forest buffers. Built fish ladders to help open spawning habitat for migratory fish. Protective features save installation money in mowing, maintenance costs
Camp Ripley, MN	1998 Army Award Winner, Natural Resources Mgt. Partnership with DNR produced some of the best research on endangered species in the state.  Strong community outreach and education programs, such as the one where students "shadow" the environmental staff, getting hands-on environmental training.
Fort Belvoir, VA	1998 Army Award Winner, Natural Resources Mgt. (less than 10,000 acres) Have model wetlands conservation and stream restoration programs. Established a forestland corridor to protect passage of various wildlife species. Cultivated partnerships to coordinate work for the Chesapeake Bay program.
Fort Bliss, TX	Participates in Water Issue Workgroup, part of the Southwest Strategy, organized to address cultural, economic, environmental quality issues in AZ and NM.
Fort Carson, CO	Contributing to recovery of greenback cutthroat trout. Implemented biological weed control program. Oral history project with Cheyenne and Arapaho.
Fort Meade, MD	Demonstrates Bay Scapes project, using native vegetation for conservation Reduces maintenance costs

Fort McCoy, WI	1998 Army Award Winner, Cultural Resources Mgt. Now has a state of the art archaeology lab, providing inventory, surveys, GIS mapping and data analysis, and report preparation to the US Army Reserves and other DOD customers. Produced an innovative Integrated Cultural Resources Mgt. Plan that is now the model for the entire Army.
Fort Riley, KS	A remote sensing tool was demonstrated on four buried farmsteads and a town from the 1920's known as Army City. The results provided more detailed mapping of cultural materials, the structure of the sites, and the configuration of subsurface structures. The maps will target excavation requirements and provide for better land use decisions. Accuracy reduces costs of excavations and helps release sites for training that are proven to have no archaeological significance
Fort Wingate, NM	Property was transferred to Bureau of Indian Affairs in trust for Navajo Nation and Zuni Pueblo. A MOA addresses restoration of the installation.
Missouri National Guard, MO	1998 Army Award Winner, Natural Resources Conservation – Team Effort. Environmental Mgt. Office team partnered with state agencies and universities to capitalize on its limited resources. Received help with a GIS system, soil conservation projects, and wildlife & plant surveys.
US Army Garrison, HI	1998 Army Award Winner, Natural Resources Conservation – Individual Effort. Developed and implemented an Integrated Cultural Resources Mgt. Plan for the 150,000 acre site, inventorying over 800 buildings & structures in 3 years. Innovative photography techniques were used to locate archaeological sites in impact areas, including where there was UXO. Information was used to plan appropriate range activities.
Yakima Training Center, WA	Restores riparian habitat to support waters flowing into Colombia River and eliminates livestock grazing.

## POLLUTION PREVENTION



The Army requests \$61 million (4.5 percent of the Army environmental budget) to support pollution prevention (P2) programs in FY00. P2 is the Army's preferred approach to meet compliance requirements, reduce

operating costs, and maintain environmental stewardship.

Our P2 program focuses on tomorrow, minimizing pollution up front instead of paying the ever-increasing costs of control, cleanup, and demilitarization. We are striving to reduce total ownership costs of weapons systems by designing for

performance and environmental protection requirements to improve operations, materials and energy use. In the face of increasing environmental requirements, these programs are critical to containing and reducing compliance expenditures as well as minimizing disruption of mission operations due to regulatory constraints. The majority of the \$64 million will be used to incorporate new technologies and improve business practices at installations; reduce hazardous materials and waste; reduce solid waste; and improve hazardous materials management.

The Army is implementing pollution prevention solutions that are clearly a result of our ongoing efforts to institutionalize environmental awareness and fully integrate environmental programmatic concepts throughout the Army. Environmental issues may not always be readily identified when considering individual organizational activities that support the Army's primary mission. Nearly every Army decision, however, has a ripple effect for a wide variety of program areas, to include the environmental one. Due to our growing success in institutionalizing environmental considerations in all that we do, environmental solutions that may be a second or third order benefit are now being realized by Army organizations outside of our environmental community. The following examples show how improving training and operations, or simply addressing sound management practices and cost reduction, has provided environmental benefits.

- Fuel cells are being utilized to provide soldiers with lighter battlefield loads to power their equipment, to improve the tactical stealth of weapons systems on the battlefield, and for longer, more reliable energy sources for field command posts. At the same time, fuel cells reduce toxic and hazardous waste streams as compared to traditional batteries; and have greater potential to reduce greenhouse gas emissions than current mobility energy sources.
- The Fort Carson training area required innovative erosion reduction techniques to maintain and improve a realistic and safe training environment. Program managers recycled 2,000,000 pounds of scrap armored vehicle track to fortify water crossings in maneuver areas—better mission support, better care of the environment.

- To reduce operating costs and decrease hazardous wastes, Fort Irwin has been recycling air filters for the Abrams and Sheridan tanks. The tanks keep running and the operations budget nets a \$5,000,000 annual savings for 10 training rotations.

### **Pollution Prevention Programs.**

Pollution Prevention Investment Fund (P2IF). The Army recently implemented the centrally managed P2IF. Its objective is to fund cost-effective, high-payback installation level P2 projects that reduce solid waste disposal and hazardous materials purchases, use, and disposal, thereby reducing or eliminating compliance requirements. Projects are prioritized based on reducing waste and toxicity, return on investment, and applicability of the approach across all Army installations.

Eight projects were funded in FY97 for \$325,000. In December 1998, these projects eliminated \$888,000 in potential costs and reduced the waste stream by 53,000 pounds. In FY99, 83 projects received \$7.5 million. Payback is projected to be in just over a year.

To increase the effectiveness of the P2 program and to better focus overall program funding, the Army is developing a strategic pollution prevention plan in FY99. The plan will address a wide range of activities including procurement, base operations, logistical operations, and weapon systems acquisition. Redesigning system specifications, procedures, and policies will be critical if we are to take advantage of new environmental products and processes. This document will provide guidance for implementation of FY00 funding and planning for subsequent years.

Hazardous Materials Management Program. The Army has made fundamental adjustments to move away from end-of-pipe treatment and control of waste by revising policies and removing requirements for hazardous materials in military specifications and standards that help lead to elimination of processes and activities that generate

wastes or emissions. A specific management process being fielded is the Hazardous Substance Management System (HSMS), a software system which tracks hazardous material from the time of request until it leaves an installation either through use, return, or as hazardous waste. HSMS centralizes hazardous material management and promotes better overall installation management in this area through more accurate environmental and logistics reporting that includes our Safety, P2, and Industrial Hygiene offices as part of the process.

Currently 49 installations have or are installing HSMS. The remaining 42 installations will be scheduled over the next 4 years, with a \$7 million annual funding level available to completely install the system. This program has become a commander's program—integrating logistics, environment, and installation management in order to improve materials management practices and meet reporting requirements for hazardous materials/wastes. Based on initial use, installations have avoided from \$200,000 - \$400,000 per installation in disposal costs.

Hazardous Waste Minimization and Disposal. Hazardous waste disposal includes off-site disposal, treatment, recycling, and incineration of: wastes and spills associated with Army operations; demilitarized residue; and PCB, asbestos, and lead paint remediation. Examples of processes that contribute to the problem include cleaning and degreasing, metalworking, painting, electroplating, ash and residue from open burning/open detonation (OB/OD) of energetics, vehicle maintenance, and off-site solvent recycling. As expected, the industrial facilities of the Army Materiel Command (AMC) account for the majority of all hazardous waste disposals each year, and through innovative management practices, they are leading the way by reducing their hazardous waste streams by over half since FY92.

Overall, the Army continues toward this goal, down to 35.2 million pounds in the 1999 reporting cycle, 8.6 million pounds less than 1997 reporting cycle. Reductions have come primarily through recycling, alternative processes (e.g, blasting surfaces with ground walnut shells in lieu of paint stripping) and substitute chemicals. We realize

further reductions will require more aggressive environmental management and we are changing technology and processes (e.g., metal plating alternatives) and requiring non-hazardous substitute materials to help achieve greater hazardous waste reductions.

Solid Waste Management and Disposal. The goals for the solid waste management program are to minimize the generation of solid wastes, develop cost-effective waste management practices, save energy, protect the public health and the environment, and recycle to conserve natural resources. Army policy mandates recycling programs at all installations, and that they be available to all contractors and contractor facilities on installations. Army recycling efforts emphasize waste stream reduction, closed-loop approaches, resale of materials, and innovative technology developments. Over 90 percent of Army installations recycle, which translates into less landfill space requirements and approximately a \$6 million savings for solid waste disposal costs from FY97 to FY99. The Army's solid waste recycling is at 288,000 tons or a 397 percent increase over calendar year (CY) 92 totals. In FY98, however, reporting for the prior calendar year showed a slight increase in solid waste disposal (2.4 million tons). This increase is due to a major Army installation improvement initiative to dispose of old World War II wood structures, and once this effort is complete, we expect to continue on our downward glide path to meet the new DOD Measure of Merit which calls for the diversion of 40 percent of the nonhazardous solid waste stream by reduction, recycling, and reuse by FY05.

Toxic Release Inventory (TRI). The Army continues to reduce the amount of toxic on-site releases to air, land, and water and off-site transfers for disposal or treatment. We have already achieved two critical goals years ahead of schedule: the DOD target for 1999 and the National Performance Review goal for 2000, with releases down to 677,000 pounds. Reduced by 74 percent of the 1994 baseline, the current total for all installations is less than that required at one of our industrial facilities in 1994. Current releases are primarily from ammunition and weapons manufacturing sites and depot maintenance.

## Strategy for the Future: Integration into Acquisition.

The Army’s ability to maintain readiness is linked to its ability to modernize weapon systems and minimize infrastructure costs. The Assistant Secretary of the Army for Installations and Environment (ASA-IE) and the Assistant Secretary of the Army for Acquisitions, Logistics, and Technology (ASA-ALT) have formed a partnership to address these concerns. Army installations and logistics communities are addressing necessary policy and procedural changes to examine the environmental ramifications of new weapons systems in the design and operations phases. An integrated systems engineering approach being tested will enable the Army to:

- Strengthen and unify its environmental policies as applied to the acquisition of weapons systems, material development, and
- Reduce the total ownership costs while mitigating risks.

Environmental considerations will be addressed from concept exploration through demilitarization and disposal—cradle to grave. The study is focusing on the environmental requirements and how these affect cost and performance of the weapon system, to include potential risks, operational impacts, and potential compliance costs; weapon systems affect the environment; and the hazardous material management and pollution prevention activities that will minimize negative impacts. This study will result in development of a weapon systems program manager handbook to assist in identifying pollution prevention opportunities and process changes.

### Pollution Prevention Success Stories

Installations	Results
Aberdeen Proving Ground, MD	1998 Army Award Winner – Pollution Prevention / Non-Industrial Completely eliminated toxic chemical releases and transfers by substituting water-based paints, rechargeable batteries, and nontoxic alternative chemicals. Reduced output by 18.7 K pounds from 1994. Also, APG studied 1,300 paint products; 24 were recommended as “environmentally preferable.” Also won a 1998 White House Closing the Circle Award for Pollution Prevention
Army Research Lab, MD	P2 Investment Project: Digital Photographic Lab eliminated the need for photo processing chemicals – avoiding \$12,500 to date.

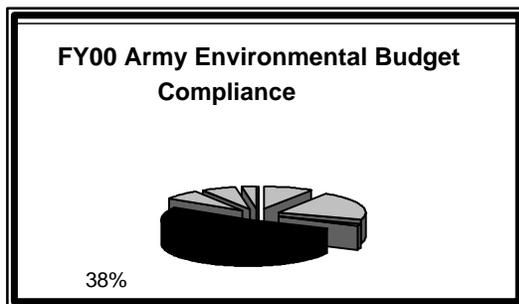
### Pollution Prevention Success Stories

Installations	Results
Fort Campbell, KY	In FY98, avoided \$1.6 million in waste disposal costs because of better business practices and HSMS software. Reduced hazardous waste disposal from 736,000 lbs. in 1992 by over 90 percent to 71,000 lbs. in 1998
Fort Leavenworth, KS	Operates a Household Hazardous Waste Management Center that helps recycle or dispose of these items as well as other products like packing boxes. Projection is \$180,000 saved annually in disposal fees
Fort Monmouth, NJ	P2 Investment Project: Solvent recovery system avoided costs of \$24,000 and reduced toxic wastes by 340 pounds.
Detroit Arsenal, MI	Avoided over \$215,000 in costs shortly after implementing the HSMS program.
Fort Carson, CO	<p>P2 Investment Project: Portable system reduced soldiers' weapons cleaning time by 75 percent and increased time for training. The solvent is recycled and reused, reducing the disposal costs and environmental liability.</p> <p>Recycling: avoided \$114,000 in landfill fees in FY98 and \$200,000 in revenues from sale of recycled material—supporting all facilities and housing, as well as the nearby US Air Forces Space Command and the Federal Bureau of Prisons.</p>
Fort Lewis, WA	Weapons cleaning units have reduced waste solvents, cleaning fluids and supplies while saving soldiers 127,000 hours per year in cleaning time – hours available for other mission required training.
Fort Hood, TX	<p>Implemented a process for eliminating residual gases in disposable cylinders. Now scrap metal, cylinders increased metal recycling by 20,000 pounds and saved \$160,000 annually in disposal costs.</p> <p>P2 Investment Project: Paint bulking/can crushing system reduced waste by 53,000 pounds and avoided \$57,000 in costs.</p>
Fort Jackson, SC & US Army Training Center	<p>1998 Army Award Winner – Recycling</p> <p>Recycled 27 percent of total solid waste by making recycling mandatory &amp; proving a user-friendly 24-hr. drive through drop-off facility.</p> <p>Recycled 100 percent of used antifreeze, chemical agent resistant coating and thinner, and solvent from weapons and part-cleaning.</p>
Fort Knox, KY	Singled out as having the most unique recycling program in Region 4. A mature program, now 15 years old, has become the largest and only full-service facility in the Region. It supports 3 nearby counties, private businesses, and 40 US Post Offices. Its most recent challenge: what to do with construction demolition debris from WWII structures. They identified a large recycling market for salvageable materials, plumbing, metals, wood, etc. Over 2000 tons of demolition debris have been recycled and generated \$160,000 for a fund designated for projects that benefit soldiers and their families—a quality of life contribution to military life.
Fort Riley, KS	Recycling Center programs avoided over \$183,000 in costs. Fort Riley has been a leader in its region, helping local communities develop recycling programs.

### Pollution Prevention Success Stories

Installations	Results
Fort Wainwright, AK	“Smart Washers” is a portable sink for greasy parts and equipment which uses a filter with enzymes that digest the oil and grease, keeping the solution clean and effective – no recycling required. Not only does it improve operations, but one washer eliminates the need for \$600 worth of solvent and \$800 in hazardous waste disposal fees, paying for the cost of a washer in one year. Won “Best Management Practice” for installation.
Redstone Arsenal, AL Aviation/Missile Cmd.	1998 Army Award Winner – Pollution Prevention / Non-Industrial Numerous P2 initiatives for 11 mature weapons systems and others under development, primarily eliminating the use of ozone depleting compounds.
Red River Army Depot, TX	The Value Engineering team changed the method of washing parts. The alternative technology now saves \$700,000 over 5 years, reducing the volume of solvent waste from over 48,000 gal/year to less than 400 gal/year. Hazardous waste from this process alone is reduced from 8,700 gal/yr. to about 100 gal/yr.
Schofield Barracks, HI	With HSMS, reduced hazardous material inventories in maintenance and engineering shops by 40 percent.
Tobyhanna Army Depot, PA	Replaced methylene chloride in stripping paint baths with a less toxic mixture. Reduced hazardous waste by 50 percent thus reducing shop employee exposure. Instituted a chrome-free rinse on its zinc plating operation. Recycles 70 percent of its solid waste stream. 1998 Army Award Winner – Pollution Prevention – Industrial Improvements in wastewater & sewage treatment systems provided early warnings of leaks and spills, reduced chemical output, improved water quality for aquatic life. 1998 White House Closing the Circle Award for Recycling / Nonhazardous Waste

### COMPLIANCE



The Army requests \$494 million (38 percent of the Army’s environmental budget) for the compliance program in FY00. This is a \$37 million decrease from last year’s request and can be attributed to completion of underground storage tank closures and upgrades, reduced

waste generation, and improved developments of our management systems, and reduction of pollution at the source. The FY00 budget targets projects required to

correct non-compliant conditions, and continues to address recurring costs, such as permits, management administration, corrective action, monitoring, manpower, and hazardous waste management disposal.

The Army focuses on achieving environmental compliance through pollution prevention, new tools and technologies, audits and better metrics, new and improved processes, and developing strong partnerships.

### **Compliance with Existing Laws.**

The primary goal of the Army compliance program is full and sustained compliance with all federal, state, and local laws and regulations. Full and sustained compliance is a big challenge. The greatest challenge, however, will be to continue our compliance posture and, at the same time, effectively transition to the prevention mode of operations to keep pace with growing requirements under current environmental laws. The following discussion highlights some of our compliance efforts with specific environmental laws.

Clean Water Act (CWA). The Army achieved 97 percent compliance for permitted wastewater treatment systems, minimizing pollution to ground and surface water. Of the Army's 1,093 facilities and system processes that fall under the requirements of the CWA, 97 percent were in compliance. The DOD definition of a compliant system is very stringent; thus, this is a very positive FY98 success story.

Maintaining system compliance, with all CWA point and non-point source requirements, requires a substantial part of the compliance budget. Requirements include recurring costs to maintain permits, update management plans, conduct daily sampling and analysis, and non-recurring costs for projects needed to bring non-compliant water treatment, wastewater treatment, stormwater collection, and pre-treatment facilities into compliance.

Our goal is to increase pollution prevention approaches to sustain system compliance. The Army is making significant progress in meeting the DOD goal to increase pollution prevention investments to 15 percent of the total required for non-recurring projects needed to sustain compliance by FY05. The current Army trend indicates a progression of 3 percent in FY97 to 6 percent in FY98, and projects 11 percent in FY00.

Safe Drinking Water Act (SDWA). The Army has several regulated drinking water facilities and continues to budget for the additional requirements of the 1996 Amendments to the SDWA. Of primary importance in FY99, the Army is developing guidance for installations to provide SDWA-mandated Consumer Confidence Reports on water quality. Major budget requirements for the SDWA include routine sampling and analysis, repairs to treatment plants and distribution systems and the protection of water sources. Specifically, our installations are implementing actions required to improve cross-connection and backflow prevention, and wellhead protection programs. All of these activities will ensure that a continuous and adequate supply of potable water is provided to the installations.

Clean Air Act (CAA). The Army maintains over 1,091 CAA permits, a substantial undertaking that requires significant funding to maintain compliance. Primary program activities required to comply with the CAA include utility and industrial facilities emissions, vehicle emissions, ozone depleting substances systems, hazards associated with asbestos- and radon-containing structures, and training-generated hazards (dust, fog oil, etc.).

The Army is currently focused towards meeting Environmental Protection Agency (EPA) deadlines for Risk Management Plans, revised National Ambient Air Quality Standards, and National Emissions Standards for Hazardous Air Pollutants (NESHAPS). Approximately 50 installations require detailed plans based on the hazardous chemicals stored or used at these facilities. The Army is also on track to meet EPA deadlines for 10 very critical NESHAPS that directly pertain to activities on

our installations. Compliance requires a process or chemical replacement, reduction, or elimination to meet allowable emissions standards. The NESHAP program represents a very integrated effort between acquisition, procurement, logistics, and environmental offices.

Vital to the Army's overall management of the CAA program is the issuance of a management guide, "Air Quality Management Using Pollution Prevention: A Joint Service Approach." The document guides the user in implementing process changes that ultimately will save millions in taxpayer dollars by eliminating compliance and cleanup costs.

Resource Conservation and Recovery Act (RCRA). As the DOD lead agent for RCRA implementation, the Army is aggressively seeking ways to meet RCRA goals and deadlines. There was a 25 percent reduction in the Hazardous Waste budget request from FY99 to FY00.

*Hazardous Waste Disposal.* The overall Hazardous Waste Disposal total is at 35 million pounds or a 41 percent decrease from calendar year 1996. Reductions in routine hazardous waste have been realized as part of base closure. The more difficult reductions will be helped by changes in technical specifications through more use of non-hazardous materials and metal plating alternatives.

*Solid Waste Disposal.* There has been a 33 percent decrease in solid waste disposal against the CY92 baseline and is currently at 2.2 million tons. In CY97, the Army identified an increase in solid waste generation that was attributed to disposal of construction debris from demolished World War II structures in Army owned landfills. Upon completion of this installation demolition initiative, we anticipate a return to a decreasing trend in solid waste generation. In addition, our installation integrated solid waste management plans will continue to emphasize increased awareness of reduction opportunities and source reduction.

*Underground Storage Tanks (USTs).* The Army has reduced its USTs from 10,436 to about 1,800, significantly reducing the potential future risk for leaks and compliance violations that could damage the environmental condition, or adversely impact mission capabilities. While the EPA compliance deadline was met, 62 USTs were temporarily closed and will require monitoring during FY99 to ensure they are permanently closed or upgraded within the year. Through a \$200 million investment and a vigorous command emphasis program, the Army has successfully strengthened its ability to attain and sustain UST compliance and reduce liability. It is important now that the Army continue its UST systemic program to fully sustain UST compliance.

*Open Burning/Open Detonation (OB/OD).* The Army is leading a DOD initiative to assess DOD OB/OD capacity and minimize the number of permitted units. All military services will finalize their unique mission requirements and encourage closure of sites that have no OB/OD requirement. The goal of this initiative is to maintain the minimum number of sites as required by demilitarization and research activities essential to the military mission. The outcome will minimize permitting costs and fewer potential environmental impacts. We will incur costs in the near-term from requirements associated with closing these hazardous waste treatment facilities; but, over the long run, the program should become more efficient by lowering costs for demilitarizing munitions. The Army currently maintains 6 permitted and 31 interim status facilities and has withdrawn 34 permit OB/OD applications since 1988.

Toxics Substance Control Act. The Army has been working with EPA as part of an interagency review team on PCB disposal regulations. For example, a decision that non-liquid PCBs pose no threat to human health or the environment eliminated a record keeping burden that would have cost \$61 million annually plus another \$209 million in demolition and disposal costs. In FY98, the Army was able to streamline the process of disposing of PCB construction and demolition debris through an interagency review that now serves as a model for subsequent EPA rules. When unnecessary regulatory burdens are eliminated, resources can be applied to the most critical environmental requirements.

## **Better Business Practices.**

Despite our commitment to environmental excellence, the Army continues to experience degrees of non-compliance in environmental management. The majority of enforcement actions are administrative in nature. Therefore, the Army is moving our program from a “find and fix” to one that “anticipates and prevents”. We plan to reduce our non-compliance status through a number of initiatives that will focus on better business practices.

Environmental Compliance Assessment System (ECAS). The ECAS is the Army’s external auditing program and remains the keystone of our compliance program. During FY98, the Army completed audits at 38 active installations, 12 state National Guard facilities, 368 Army Reserve Command facilities, and 4 Army Reserve Command installations. The Army has witnessed a trend of fewer negative findings in all areas demonstrating an increase in compliance to state and federal laws through this external assessment and analysis program.

The ECAS is continuously reviewed and improved upon to streamline the process and enhance its quality and usefulness to installation commanders. The program adopts an industry “systems management approach” that goes beyond performance reporting, to analyzing root causes and potential root causes of compliance issues. Leadership now has a tool to comprehensively examine environmental program management as it relates to performance of the Army’s overall mission and achieve greater efficiency and cost effectiveness by addressing non-compliance issues at the source.

Installation Status Report (ISR) Part II. Part II of the ISR is an annual internal assessment to provide a macro-level program compliance status and to help prioritize resource requirements for the environmental program at Army installations. All Continental United States and Overseas installations have fully implemented ISRs. We

continue to improve standards and the utility of the ISR to installation commanders and environmental program managers.

Environmental Quality Report (EQR). Additionally, the Army has fully fielded a web-based EQR used by installations to submit quarterly compliance, P2, and conservation data directly to their headquarters. The use of electronic communications allows the Army to have interim assessments to make program adjustments and give a status report to DOD and Army leadership as needed.

Building Partnerships. To enhance Army Compliance programs, we are continually seeking to build stronger partnerships with public and private stakeholders as well as improving relationships with the regulatory community. Environmental protection requires the participation of a diverse group of public and private stakeholders. The Army established four Regional Environmental Offices (REO) which also serve as DOD Regional Environmental Coordinators. These REOs address a critical need to increase and improve communication with the public and regulatory communities and provide a dual benefit to the military and the states. They help facilitate the military mission by communicating information to installations on hundreds of compliance regulations. The many state-by-state and tribal government variations, and potential impacts are also included. They conversely promote information flow to federal, state, and local regulators and tribal governments about military mission requirements. These continuing efforts make important contributions to improving military-regulator-community relationships, efficiently and effectively minimizing impacts to the military mission and resources.

### **Enforcement Actions.**

The number of new enforcement actions (ENFs) brought against Army installations in FY98 decreased 24 percent from FY97, which continues our positive trend. The majority of the new and open actions continue to be RCRA and Clean Water Act violations. The new ENFs were administrative or operational findings and require

the most continual vigilance to avoid. The Army will continue to emphasize proper training and strict adherence to documentation procedures. There were 99 still unresolved ENFs at the close of FY98. Sixty were administrative findings and can be easily fixed. The remaining 39 require long-term projects of 2-5 years and funding is available for them.

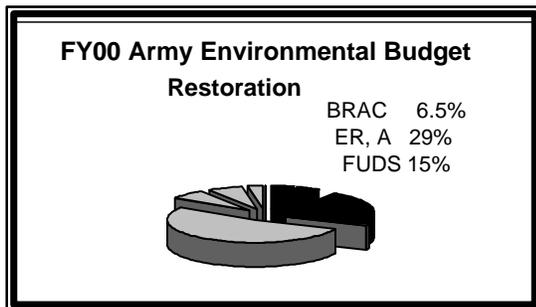
The Army is concerned that ENFs are not decreasing fast enough, thus a new FY99 goal is to further reduce open and new ENFs by 50 percent. The FY99 goal specifics are to reduce ENFs and associated fines by addressing root causes identified in the ECAS evaluations, improving management practices and training. Old open ENFs will be targeted and administrative findings will be closed as quickly as possible. To bring additional command awareness and emphasis to the performance of the environmental program in FY99, quarterly summaries of violations and the progress toward closure will be presented to the Army Chief of Staff. Better interim data will be available to allow for mid-year corrections in management decisions.

#### Compliance Success Stories

Installation	Success	Accomplishments/Benefits
New York National Guard, NY	1998 Army Award Winner Environmental Quality – Individual Contribution	<ul style="list-style-type: none"> <li>• Working with government and NGOs, provided leadership for plans to protect the Central Pine Barrens area of Long Island.</li> <li>• With their effective stewardship of the Long Island ecosystem, they were able to obtain a permit for a local aviator training ground, saving the mission and facility over \$100,000 in travel costs to another facility.</li> </ul>
Radford Army Ammunition Plant, VA (AMC)	1998 Army Award Winner Environmental Quality –Industrial Installation	By (1) managing production processes and waste streams from the manufacture of a wide variety of national defense products and (2) working with the community and regulators, the plant was able to meet all requirements of their regulatory permits.
Fort Bliss, TX (TRADOC)	1998 Army Award Winner Environmental Quality – Non-Industrial Installation	Through program management in water conservation, waste management, pollution prevention project savings and storage tank compliance actions, Fort Bliss has documented over \$3.3 million in cost savings and cost-avoidance over the past two years. By 2001, Fort Bliss estimates its projected cost savings since 1995 to be over \$10 million.

Fort McNair, DC (MDW)	Selected as official host site for signing of new EPA Chesapeake Bay Federal Agencies Agreement.	On November 5, 1998, Fort Lesley J. McNair was the site where dignitaries from federal agencies, as well as representatives from Congress, gathered to sign the latest federal agencies agreement with the EPA Chesapeake Bay Program
US Army Environmental Center (ACSIM)	On line "Commander's Guide".	<p>The U.S. Army Commander's Guide to Environmental Management can help commanders develop and maintain effective environmental programs—and now it's only a few computer clicks away. The revised Commander's Guide is available for browsing or downloading on the U.S. Army Environmental Center Website.</p> <p>Compiled by Army environmental experts, the Commander's Guide addresses environmental management, regional coordination, innovative technologies, regulatory inspections, environmental training, program areas (from air emissions management to wetlands) and more.</p>

## RESTORATION



The Army requests \$378 million for active site cleanup (29 percent of the Army's environmental budget) and \$85 million for BRAC sites (6.5 percent). In addition, the DOD has requested \$199 million (15 percent) for the Formerly Used Defense Sites (FUDS) program,

which the Army manages for DOD. Improved business practices, partnerships, innovative technologies, and improved site data analyses, has enabled us to lower the projected "total cost- to-complete" for active site cleanup remedies from FY96 to FY99 by over \$3 billion. Over the next five to seven years, the Army expects to gain significant returns on investment from its management and technology to continue this trend.

## Program Status.

The environmental restoration program cleans up previously contaminated active, BRAC and FUDS sites. Protection of human health and the environment is the primary goal for the restoration program. At active sites, the Army analyzes “highest risk first” to prioritize cleanup activities. Another Army goal is to move sites into “response complete” phases as quickly as possible and restore sites to productive use. Base Realignment and Closure (BRAC) decisions also focus on highest risk first and tailor cleanup requirements to the community’s reuse plans in order to remove potential hazards at installations and accelerate land or facilities transfer to communities. From all BRAC properties to date, we estimate 205,000 acres either have or will be transferred to communities (sold or donated) or to other federal agencies after cleanup is certified complete. Meeting goals at FUDS properties depend on strong communication, partnership, and community involvement among DOD and program stakeholders. Priority setting for the FUDS program is based on the evaluation of relative risk, along with other factors such as legal agreements, stakeholder concerns and economic considerations.

Active Sites. By the end of FY99, the Army estimates that at over 8,000 of the over 10,000 active sites in our program, we will have either completed response actions or have no further response actions planned. The Army targets 70 percent of its budget for cleanup on active sites in FY99, and increasing it to 78 percent in FY00, steadily minimizing the percentages for studies and program management. In 1995, only 58 percent of the budget went to actual site cleanup, indicating our continual trend of conducting more cleanup and less analysis and management. The table below shows our progress thus far. In FY98, 405 active sites were designated “response complete.”

**Cleanup Status (December 1998)**

	# of Installations with Responses Required	# of Sites	Level of Relative Risk			Remedy in Place or Response Complete	Not Evaluated
			High	Med	Low		
Active	1,076	10,204	1,013	536	602	8,027	26
BRAC	51	1,944	217	153	240	1,044	290

Base Realignment and Closure (BRAC). Nearly half the designated BRAC restoration sites have been “achieved” either with response completed or no further response required. Of the 117 BRAC installations, only 51 still require cleanup actions. The BRAC office plans to conduct relative risk evaluations at 200+ sites in FY99 and 60 more in FY00. The Army’s budget request for BRAC environmental programs of \$85 million is \$285 million less than the FY99 appropriations due to a one-time change to incrementally fund all BRAC projects. Our total BRAC environmental program funding request is \$261 million, of which \$176 million is an advance appropriation request for FY01. Included in implementing this business practice is the Army’s commitment to the BRAC process with no delay or cancellation of projects. The advanced appropriation request for FY01 will permit the Army to award contracts for the entire scope of work, but with only the actual funding on hand for the portion to be accomplished in FY00. Thus, the Army will be able to proceed as scheduled in FY00 in full support of the President’s fast-track cleanup initiative.

Formerly Used Defense Sites (FUDS). Of the 9,164 FUDS properties, 5,882 or 64 percent are ineligible or require no further DOD actions; 2,689 sites (30 percent) require response actions; 458 FUDS properties (5 percent) have preliminary assessments underway; and only 135 sites (1 percent) have to schedule the assessments. In FY98, FUDS completed 4,186 site investigations, 1,022 remedial designs, and over 1,000 remedial actions. These numbers show steady progress in addressing the FUDS properties despite financial constraints.

### **Management Initiatives and Improvements.**

While concern for human health and environment is always primary, program managers are finding alternative technologies that net cost and timesavings and better assessments of solutions already in place. There will be greater emphasis on working with communities and regulators to close out sites. The net improvements will help the

Army meet its future cleanup targets for active sites and BRAC sites on time and on budget. The following sections review some recent management improvements.

### Better Business Practices

*Defense State Memorandum of Agreement (DSMOA).* The Army is the DOD lead agent for the DSMOA. The program funds state regulators who support the military's cleanup program. To date, 46 states, the District of Columbia, and 4 territories have agreements. In FY98, the US Army Corps of Engineers (USACE) collaborated with the states to implement a new process to develop Cooperative Agreements, specifying each state's projects and financial requirements over the next two years. A new cooperative agreement guide improves planning, priority setting, schedules for cleanup, communication, cooperation, and accountability. The process will be reviewed this year; evaluating if improvements need to be incorporated in the guidance.

The DSMOA program continues to demonstrate its value to the Army cleanup program by ensuring that state personnel are available to review documents, attend meetings, and keep projects on schedule. In addition, the new Cooperative Agreement process involves the states as partners in setting project priorities and schedules. States will benefit in that they can more effectively manage their resource requirements. These state partnerships have been invaluable, as they have identified ways to expedite cleanups and even identify cost-avoidance measures that reduced program requirements while still ensuring that human health and the environment are protected.

*Restoration Advisory Boards (RABs).* The Army has aggressively pursued public participation in all of our restoration programs. The cleanup of Army installations requires community involvement as early as possible and throughout the environmental restoration process. RABs provide a forum to have input on the installation's cleanup program and allow for discussion of community concerns. Active installations, BRAC sites and FUDS properties have action plans to manage restoration activities that are to

be updated annually. Installations are encouraged to involve EPA and state regulators as well as RAB members in these updates.

As of September 1998, there was a 25 percent increase in RABs at active sites (now 26), with 38 at BRAC sites. There are also 7 new RABS for FUDS properties, for a total of 28, representing a 33 percent increase over FY98 for FUDS sites.

By the end of FY98, all but one community involved in active or BRAC sites was surveyed to determine interest in forming a RAB. Four new RABS are projected for FY99 based on these surveys. Installations that do not have initial interest in a RAB are expected to follow up and re-evaluate community interest periodically. The Army spent \$1.3 million on administrative support for RABS, averaging \$21,000 per installation.

Congress directed DOD to establish a means to provide independent technical assistance to RABs and Technical Review Committees (TRCs). Accordingly, DOD's Technical Assistance for Public Participation (TAPP) program was instituted in mid-FY98. This program can award contracts up to \$25,000 to provide RABS with independent scientific and engineering expertise and training to guide their evaluations of their installations' cleanup program. Installation staff and community members at all 72 sites with RABs or TRCs were trained in how to use this contract vehicle.

*Installation Restoration Buyout Strategy.* In FY98, the Army directed funding to "buyout" ongoing cleanup of 6 installations, with 10 more projected for FY99 and 13 for FY00. This means that all sites at those installations have the "remedies in place" designation. The only remaining work is long-term monitoring/operations. This approach can, in the long run, decrease the management costs associated with keeping restoration offices open and eliminate the inflationary increase in the project cost itself.

### Technical Improvements

*Independent Technical Review.* To maximize the effective use of restoration

funds, the Army adopted an independent technical review (ITR) process, (formerly known as peer reviews) giving installation commanders access to outside technical and procedural expertise. In FY97 and FY98, 14 BRAC installations were reviewed and 2 active installations had pilot reviews. In FY99, ITRs are underway at 12 BRAC installations and 8 active installations. One of the most prominent examples of savings was at the Savanna Army Depot in Illinois, where the ITR determined that because of minimal risk, a proposed \$68 million remedial plan would not be necessary.

Because most of the ITRs in our BRAC program will be completed in FY99, the Army expects to refocus its efforts on the active sites cleanup program. Using BRAC figures as projections for active sites, we estimate that we could identify at least \$10 million per year for five years in savings or costs avoided.

*Groundwater Pump-and-Treat Systems Effectiveness Review.* A new emphasis on evaluating the effectiveness of groundwater pump-and-treat systems, both those in place (30) and those being proposed (70), stands to bring significant cost reductions to the restoration program. This “effectiveness review” will use top technical experts and regulators to ensure existing systems have performance goals that define when the cleanup is complete and systems can be closed. Systems not reaching performance standards may be modified to ensure the Army is operating effective treatment systems in order to protect human health and the environment. The net impact is the potential to reduce the current cost-to-complete estimate by \$8 million per year for the next five years.

The first site that is using this approach is Hunter Army Airfield, Georgia. The reviewers recommended an alternative to the proposed engineering solution. The expectation is that natural attenuation will take care of the pollution, that is, the soil microbes will detoxify the soil naturally. A monitoring system will track progress. If regulators approve this alternative, the Army could lower construction costs by \$1.5 million and \$5 million in life-cycle costs over the original cleanup option.

The FY99 projection is to review three BRAC and three active sites, and use their experiences to develop a groundwater strategy guide for other Army installations.

*Site Close-out and Long-Term Operations and Monitoring (LTO/LTM).* To ensure that Army sites that have been cleaned up are closed out properly and the work is complete, the Army joined a workgroup including the states, other services and regulators to draft “The Environmental Site Close-out Process Guide.” The guide outlines CERCLA and RCRA requirements and the steps to final site close-out, addresses the planning efforts for the final cleanup stages, and ensures consistency across sites. In FY99, the Army is coordinating with other services to develop more specific guidelines in three areas: Five-Year Reviews, Data Management Guidance, and Remedial Action Operations/Long-Term Monitoring Optimization.

**FUDS Program.**

The Army serves as the executive agent for the FUDS program, with USACE managing and executing the cleanup work. The budget for FY00, provided by a separate appropriation, is \$199 million, a decrease of 13 percent from the FY99 appropriation. Environmental cleanup procedures at FUDS are similar to those at active Army installations. However, information concerning the origin and extent of the contamination, land transfer information, past and present property ownership, and program policies must be evaluated before a property is considered eligible for the FUDS program.

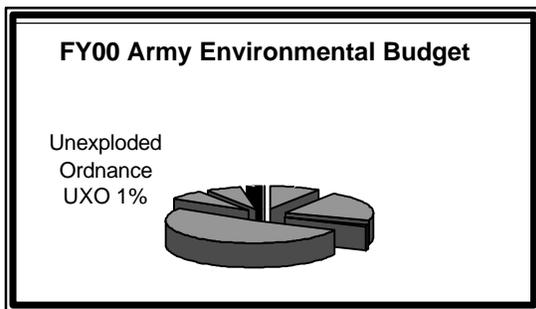
**Restoration Success Stories**

<b>Clean Up Successes – Active /BRAC / FUDS</b>	
<b>Site</b>	<b>Activities /Successes</b>
Army Research Lab, MA	Began processing to delete 37 acres from NPL
Federal Law Enforcement Training Center, GA	Army and Navy detachments teamed with the Treasury Dept. to clean hazardous, toxic waste Project costs reduced by \$125,000 and 6 months.
Dugway Proving Ground, UT	Avoided \$7M in project costs by choosing a soil

	decontamination instead of incineration
Letterkenny Army Depot, PA	Property transferred w/ land use controls to restrict ground water use while cleanup continues
Schofield Barracks, HI	“Construction Complete” issued September 1998
Tobyhanna Army Depot, PA	Used natural attenuation instead of pump and treat, avoiding a \$7.5M cost
Twin Cities Army Ammunition Plant, MN	Final “Record of Decision” for installation. Recovered \$3.9M from its operating contractor’s insurance. 1998 Army Award Winner, Environmental Cleanup
FUDS Camp McCain, MS	<ul style="list-style-type: none"> <li>• This typical wooded ordnance site had training, firing, and impact ranges, maneuver areas, troop housing and containment area.</li> <li>• All sites completed</li> <li>• Innovative approach, a random walk approach for • characterizing ordnance &amp; explosives, and new technology may serve as a model for future ordnance investigations. Project completed ahead of schedule and \$100,000 under budget .</li> </ul>
FUDS Raritan Arsenal Landfill, Middlesex Co., NJ	Alternative solution for landfill cleanup developed by a USACE rapid response team. Faster and more efficient cleanup resulted in a \$1 million lower project cost.
FUDS Blaine Naval Ammunition Depot, NE	Extensive work with the public and regulatory stakeholders allowed the substitution of 4 removal techniques in place of traditional, less efficient methods. USACE, Kansas City District, received the NE Dept. of Environmental Quality “Environmental Excellence Award.” Support from community & Western & National Governors’ Association.
FUDS Walker AF Base, Roswell, NM	Extraction wells removed TCE in groundwater & pumped contaminated water into city’s sewage treatment plant. Cost sharing w/ city saved DOD \$190K of the \$790K for the project
FUDS Gerstle River Expansion Area, Delta Junction, AK	Community feared that unexploded nerve agent projectiles from a mid-60s testing project were in a proposed excavation site. Declassified documents & historical research, including interviews with personnel who worked at test site, alleviated community fears
FUDS Fort Buchanan, PR	All sites completed.
FUDS Camp Grayling Army Airfield, MI	All sites completed.
FUDS Pohakuloa Training Area, HI	All sites completed.
FUDS Point Pleasant OMS #6,	. All sites completed

FUDS Fort Totten, VA	All sites completed
FUDS Riverbank Army Ammo Plant, CA	All sites completed – Reduced long term operating costs by 40 percent - \$1.2 million annually
FUDS Helemano Rad Rec Station, HI	All sites completed
FUDS Nebraska Ordnance Plant	Due to the controversial nature of the incineration plan, USACE organized extensive opportunities for public participation and education about the technology. Planning, partnering, and open communication led to significant time & cost advantages, with 16,000 tons of contaminated soil treated in 9 months, from construction to completion.
Tooele Army Ammunition Depot, UT (BRAC)	Prepared a “Finding of Suitability” for early transfer

### UNEXPLODED ORDNANCE (UXO)



For the first time, the Army requests \$10 million (approx. 1 percent of the Army’s environmental budget) to address unexploded ordnance on closed ranges at active installations. These funds, addressing concerns in the Range Rule, will initially focus

on conducting a comprehensive inventory of these ranges. This is not the sole Army commitment to UXOs. Within the current Army budget, approximately \$60 million is being targeted to address UXO at BRAC installations and FUDS properties. Additional funds in Environmental Quality Technology program are also working on UXO issues.

#### **Military Munitions: An Important Focus.**

Several recent initiatives, most notably EPA’s Munitions Rule, and the proposed DOD Range Rule, efforts that the Army has led for DOD, have helped the military to refocus attention on the application of life cycle management principles to munitions.

The Military Munitions Rule defines when military munitions become waste and provides for safe storage and transportation of such waste. The good news for the military is that EPA granted the military a “conditional exemption” for storage and transportation of certain waste munitions. This exemption was granted because DOD’s existing explosive safety regulations already provided sufficient protection of human health and the environment.

The proposed DOD Range Rule is to be a comprehensive regulatory framework for addressing UXO on closed, transferred, and transferring military ranges. This framework, which we are developing in conjunction with EPA and other federal agencies, will establish a process for conducting UXO responses that are protective, technically feasible, and cost-effective, and which provides a significant role for federal, state, tribal, and citizen participation in the process. As part of the overall Range Rule effort, the services have engaged in a partnering initiative to develop a risk management methodology specifically tailored to UXO responses. Through this partnering effort, we are working with these other stakeholders to develop a standardized risk management strategy, risk assessment tools, and risk communication practices.

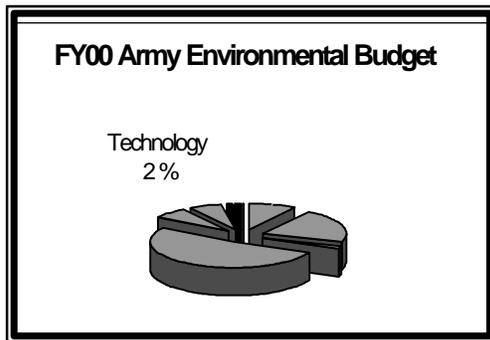
The Army is also aggressively seeking input from the public, states, Native Americans, EPA, other federal agencies, and special interest groups on a broader set of munitions-related issues through the National Munitions Dialogue, a facilitated forum where participants discuss everything from munitions acquisition and production through their use and demilitarization.

### **Operations and Environmental Executive Steering Committee for Munitions.**

The efforts above have led DOD to establish an executive steering committee representing all the services. The Operational and Environmental Executive Steering Committee for Munitions (OEESCM) is permanently co-chaired by the DASA(ESOH) and a rotating Service operator. The leadership provided by this joint operations and

environmental relationship is proving to be successful and along with other key communities, such as acquisition, logistics, and legal, etc., the DOD is taking a tactical and strategic approach to address concerns by looking into the future. The committee is in the development stage of a strategic plan for munitions and range management for the next 10 years. Through its subcommittees, the OEESCM will develop implementation plans for 1) acquisition, 2) stockpile management, 3) range and munitions use, 4) demilitarization, 5) range response actions, and 6) public involvement. The active participation of the “operators” in this effort is seen as a true integration of environmental concerns into the military mission.

### ENVIRONMENTAL QUALITY TECHNOLOGY (EQT)



Our FY00 technology budget request is \$28 million (2 percent of the Army environmental budget request). This amount will fund continuing Army Research and Development (R&D) and management efforts to address the

Army’s high priority needs by developing and exploiting innovative technologies, processes, and strategies for the total Army. In addition to the Army’s FY99 request of \$28 million, Congress appropriated \$51 million for directed programs targeting technological advancements in pollution prevention and compliance for which the Army will exploit to the fullest extent possible.

#### **EQT Vision:**

To achieve, through technology development and exploitation, environmentally compatible installations and systems that support readiness, modernization and quality of life.

### ENVIRONMENTAL QUALITY TECHNOLOGY (EQT) PROGRAM.

The Army is committed to be positioned as a leader in environmental stewardship. To succeed in this goal, it is incumbent upon the Army to leverage its resources wisely to meet its responsibilities without compromising the Army's primary warfighting mission and to enhance all readiness, modernization and quality of life initiatives wherever possible. More than ever before, the Army is cognizant that EQT advancements "Hold the Key" in meeting those responsibilities that cross over all environmental disciplines – restoration, pollution prevention, compliance and conservation. The Army can significantly enhance its ability to conserve natural resources, reduce environmental operating costs, and field systems with minimal or no adverse environmental impact as we support the total Army mission.

Last year, the Army took a major leap towards this objective and established an EQT management process and an investment strategy. The Army's approach to managing EQT is based upon high return-on-investment using economic analyses to identify the best projects for funding based on the Army mission and environmental urgency, potential cost-avoidance, investment costs, and program risk. Its goals are to:

- focus on the highest priority user needs for the total Army,
- provide a solid science and engineering base for the future, and
- concentrate the efforts of Army technology developers to support the environmental strategy.

The return-on-investment uses economic analyses to identify the highest yield projects based on the Army mission and environmental urgency, potential cost-avoidance, investment costs, and systemic program risk. We invest now to curtail future environmentally related expenditures.

Central to the Army EQT program is the three-tier oversight structure that focuses investments and provides visibility for the Army's R&D efforts to senior leadership and Congress. The Environmental Technology Technical Council (ETTC)

handles the oversight of the program. The ETTC members represent the Total Army – senior executives and general officers from the environment, acquisition, research & development, engineering, installation management, medical, operations/training, and logistics communities. This group focuses the Army's science and technology solutions and the required research, development, test, and evaluation (RDT&E) requirements. After approving the program, the ETTC continues to provide periodical oversight to ensure its progress.

Two other levels support the ETTC. The Environmental Technology Integrated Process Team (ETIPT) formulates projects based on requirements established by the Technology Teams in each of the program areas -- compliance, conservation, pollution prevention and restoration. The Technology Teams have representatives from the R&D community and the end-users of the new technology, who jointly develop and implement specific plans to address the users' highest priority requirements. The significance of this program process structure is that it ensures that total Army requirements are developed from the bottom up and meet needs in the field.

Investment Strategy. An investment strategy policy document was developed and implemented by the Army. It serves as guidance for the technology community prescribing measures for planning, programming, budgeting, and execution of the Army's EQT program, ensuring:

- resources are dedicated to the highest priority and provides the framework within which to produce program plans
- technology initiatives demonstrate timely, cost-effective solutions
- user buy-in is obtained prior to any investments in EQT
- technologies from other services, agencies and industry are leveraged

Army Environmental Technology Requirements Assessments (AERTA): Integral to the EQT Investment Strategy is the process to define a users needs documentation process which ensures that emerging Army-unique environmental RDT&E requirements are identified. It also supports participation of the DOD Environmental Security Technology Requirements Group (ESTRG) with its website maintained on the Defense

Environmental Network Information Exchange (DENIX). The site serves as the DOD's central repository for user requirements that can be accessed by other agencies and industry.

**Program Highlights.**

The EQT process produced the top FY99, R&D programs for the Army. These new technology initiatives illustrate the Army's approach in sustaining the primary warfighting mission by addressing high priority user needs while enhancing environmental stewardship. The table below is a list and description of the Army's focused and balanced EQT program addressing requirements in each program area.

Army High Priority Programs – FY99

<p><b>P2</b> <b>CARC</b></p>	<ul style="list-style-type: none"> <li>• Current CARC paint is high in VOC, generates hazardous waste and require multi-application steps, all of which are high annual cost to the Army.</li> <li>• The technology will produce a non-VOC CARC and will not generate hazardous waste, thus reducing annual costs to zero by 2006.</li> <li>• This program avoids spending \$25.3M at an investment cost of \$12M providing a net cost-avoidance of \$13.3M</li> </ul>
<p><b>P2</b> <b>Sealants</b></p>	<ul style="list-style-type: none"> <li>• Sealants and Adhesives are used widely throughout The Army</li> <li>• These contain products that are considered hazardous to Human health and the environment</li> <li>• This technology will ensure environmental compliance, Reduce work force exposure, and minimize waste Disposal costs</li> <li>• By 2006 DOD will begin to avoid \$13.6 M in hazardous waste disposal costs escalating to \$50M in 2010</li> <li>• This program will avoid spending \$221M at an Investment cost of \$8.8M for a net cost-avoidance of \$213M</li> </ul>
<p><b>P2</b> <b>Ordnance</b></p>	<ul style="list-style-type: none"> <li>• Manufacture and use of energetic materials/munitions produces VOC's and hazardous materials costing the Army \$56.6 M on environmental compliance.</li> <li>• This technology will produce alternate materials and Sealants which will greatly reduce those annual costs By 2006</li> <li>• This program will avoid spending \$396.6M for an Investment of \$19.3M for a net cost-avoidance of \$377.3 M</li> </ul>
<p><b>P2</b> <b>Plating</b></p>	<p>Currently, the Army uses heavy metals to meet performance standards for fasteners and other external surfaces/coating. These heavy metals are toxic, regulated and /or Require pre- or post- treatment using hazardous materials This technology will produce alternate coating materials which will reduce environmental costs associated with</p>

	<p>plating by \$16M/year by 2005  This program will avoid spending \$69.6M at an investment  Cost of \$16.5M for a net cost-avoidance of \$53.1 M</p>
<p><b>P2</b>  <b>Halon</b></p>	<p>By law, Halon is no longer produced, while the Army still relies on existing halon supplies in 4 major applications which impact readiness.  Solutions identified, available, or new systems proposed for various categories within the broad range of applications.  Funding of \$3.3 M for RDT&amp;E required for design and retrofit, implementing available solutions.</p>

<p><b>COMPLIANCE</b>  <b>Lead Hazards</b>  <i>(Fully Funded Program in 1998)</i></p>	<p>Develop a standard methodology to make decisions for the environmentally-safe and cost effective removal and disposal or reuse of sources of lead contamination.  Demonstrate microencapsulation for lead in soils (applied research) and lead hazard management system at two Army installations.  Test innovative technologies to be developed for the abatement of lead in soil such as chemical stabilization, soil washing, electrokinetic removal of lead ions, and in situ vitrification.</p> <ul style="list-style-type: none"> <li>Technologies developed in the SERDP program for lead abatement of steel substrates such as coating systems for over-coating lead painted steel will be demonstrated.</li> <li>Cost-avoidance potential = \$406M at an investment cost of \$4.4M</li> </ul>
<p><b>COMPLIANCE</b> <b>Hazardous Air Pollutant Control</b>  <i>(Fully Funded Program In 1998)</i></p>	<p>Develop methods to assess potential for emission reduction associated with Army HAP sources.  Chromium electroplating is a unique pollutant generating operation in that particulates are generated from the bursting of gas bubbles caused excessively by the inefficiency of plating chemistry. Other hazardous chemicals are found in cleaning, painting, and stripping operations.  Program will focus on improving these technologies to reduce costs of compliance.  Cost-avoidance potential = \$150M at an investment cost of \$7.2M</p>
<p><b>COMPLIANCE</b>  <b>Munitions Wastewater</b></p>	<p>Stringent environmental regulations threatens the Army's mission readiness for munitions production as a result of not having advanced wastewater treatment technologies.  Identify the mechanisms responsible for treatment transformations and the pathways and controlling factors important to the treatment process.  Field demonstrations of candidate technologies using commercial equipment will demonstrate / yield technical data packages and design information such that cost estimates can be reliably made.  Cost-avoidance potential = \$148M at an investment cost of \$26.1M</p>
<p><b>COMPLIANCE</b>  <b>Dust Control</b></p>	<p>Develop methods to assess potential for emission reduction associated with Army dust-generating sources.  Develop and test physical technologies for controlling dust primarily through the alteration of trafficked surface characteristics, as well as biological technologies for controlling dust. Demonstrate proven chemical, physical, and biological technologies for controlling dust on roads, trails, and landing strips.  Develop guidance for evaluating and isolating dust producing activities, identifying opportunities for operational adjustments, selecting proper technologies, locating technology suppliers, and implementing selected technologies  Cost-avoidance potential = \$17.4M at an investment cost of \$1.8M</p>

<p><b>RESTORATION</b></p> <p><b>Explosives in Groundwater</b></p>	<ul style="list-style-type: none"> <li>• Explosives and Organics contaminants in groundwater</li> <li>• are a widespread Army environmental problem</li> <li>• Investing in this technology will reduce project life cycle time, reduce costs by half and destroy contaminants in place</li> <li>• This program will avoid spending \$617M at an investment cost of \$28.5M</li> <li>• This technology will reduce treatment costs from \$1- 5/kgal in 1995 to \$.10- 2.00/kgal in FY 2005</li> </ul>
<p><b>RESTORATION</b></p> <p><b>Unexploded Ordnance</b></p>	<ul style="list-style-type: none"> <li>• Addresses complex environmental problem affecting millions of acres of Army land -- UNKNOWN TOTAL LIABILITY</li> <li>• Ultimate goal is a tenfold decrease in false alarm rates</li> <li>• This program will avoid spending \$124 M at an investment cost of \$58.3 M (does not include affects of the Range Rule)</li> <li>• Investing in this technology will reduce false alarm rates by 90 percent</li> </ul>
<p><b>RESTORATION</b></p> <p><b>Explosives in Soil</b></p>	<ul style="list-style-type: none"> <li>• Current explosives contaminated soil/sediment treatment technologies are ex-situ technologies requiring excavation prior to treatment.</li> <li>• New and/or advanced technologies in exsitu and insitu treatment of explosives and organics in soils will be developed and evaluated regarding efficacy to types explosives and organic contaminants, concentration, and quantity as well as site geophysical and other characteristics.</li> <li>• Acceptable candidates will undergo final demonstration and validation at Army sites requiring explosives/organics remediation in the soil.</li> <li>• Cost-avoidance potential = \$171M at an investment cost of \$21M</li> </ul>
<p><b>RESTORATION</b></p> <p><b>Inorganics</b></p>	<ul style="list-style-type: none"> <li>• Inorganic contamination is a widespread Army problem, small arms ranges and training are affected by lead contamination</li> <li>• This technology will allow the cleanup to be done in-situ and will reduce costs by \$25-\$30/ton</li> <li>• This program will avoid spending \$356M at an investment cost of \$14M</li> <li>• By 2005 this technology will reduce treatment costs by 50 percent at most sites</li> </ul>
<p><b>RESTORATION</b></p> <p><b>Risk Assessment</b></p>	<ul style="list-style-type: none"> <li>• Environmental costs are driven by the dilemma of determining “how clean is clean”</li> <li>• Risk to human health and the environment has to be determined</li> <li>• This technology will reduce the uncertainty associated with both exposure assessment and with the quality of effects data</li> <li>• This program will avoid \$703M in costs at an investment of \$31.8M by 2004</li> <li>• Integrates transport, fate, and effects evaluation process into regulator accepted decision tool</li> </ul>

<p><b>CONSERVATION</b></p> <p><b>Military Operations on Threatened &amp; Endangered Species</b></p>	<ul style="list-style-type: none"> <li>• T&amp;ES on military lands constrains training/testing due to restrictions imposed by regulators – Equates to a reduction in readiness</li> <li>• Funding this technology will reduce restrictions and provide credibility with regulators</li> <li>• This program avoids spending \$20.3M at an investment cost of \$6.8 M, NPV</li> <li>• Recoups investment costs prior to FY06</li> </ul>
<p><b>CONSERVATION</b></p> <p><b>Baseline Inventories</b></p>	<ul style="list-style-type: none"> <li>• There are 194 known threaten and endangered species (T&amp;ES) on Army lands for which there is no cost-effective technique to survey or monitor</li> <li>• Funding this technology will provide credibility to Army management decisions and avoidance of unwarranted mission restrictions</li> <li>• End result will lead to more available training land with less restrictions, increased readiness</li> <li>• This program avoids spending \$69.6M at an investment cost of \$2.5M and recoups investment costs prior to FY05</li> </ul>
<p><b>CONSERVATION</b></p> <p><b>Mitigating Army Unique Impacts</b></p>	<ul style="list-style-type: none"> <li>• Research to quantify army unique impacts on military installations' soils, flora, fauna, water, and human health and welfare.</li> <li>• Technology provided, improved, demonstrated, and implemented capabilities to incorporate noise management tools. In addition it develops a framework to prioritize threatened and endangered species (TES) management actions.</li> <li>• Additionally, provide a comprehensive risk assessment framework that is targeted toward mission activities of the Army.</li> <li>• Cost-avoidance potential = \$42M at an investment cost of \$4.5M</li> </ul>
<p><b>CONSERVATION</b></p> <p><b>Land Capability</b></p>	<ul style="list-style-type: none"> <li>• There is limited ability to match training with land condition</li> <li>• Current "Carrying Capacity Methods" over estimate erosion and underestimate land condition</li> <li>• This technology will develop land use distribution models, and land condition prediction models which will result in improved training scheduling, 10 percent-30 percent increased utility in management dollars and a reduction in corrective training days</li> <li>• This program avoids spending \$72.6M at an investment cost of \$2.5M</li> </ul>

**Range XXI.**

The Range XXI Program is redesigning training ranges for our future Army that meets readiness requirements with less burden on the environment and less cost for compliance and cleanup. The technology aspects of the Range XXI Program focus on 1) identifying and managing emissions that result from the use of munitions, 2) re-engineering small arms ranges, 3) characterizing impact areas, 4) sustaining training/test areas, 5) interfacing with acquisition decision-making.

The projects in the box below highlight innovative technologies for use on Army ranges.

### **Current Range XXI Accomplishments**

Green Ammunition – A 5.56 mm lead-free bullet for the M16 family of rifles has passed all combat performance tests, with better performance than the original and 1 penny per round cheaper. Other initiatives are underway to reduce lead content in the 9 mm, 7.62 mm, and .50 caliber rounds as well. The first million batch of 5.56 mm rounds will be produced by the end of 1999 for training and combat use.

Emissions Studies – A series of studies are identifying and quantifying emissions from smoke, pyrotechnic, and high explosive munitions under actual operational conditions to determine any environmental or health impacts of testing and training.

Unexploded Ordnance (UXOs) – These studies are attempting to identify the environmental impacts of UXOs, including the factors that contribute to degradation, which type degrade, the impact on the environment and the use of computer models in making future predictions.

Dust Control – Guidance describes alternative dust control agents, site maintenance and stabilization methods. Improves soldier safety, maintains training, and reduces environmental impacts and vehicle maintenance. Significant cost savings for operation and maintenance of unsurfaced roadways, tank trails, and helipads.

Tactical Training Area Planning and Design-- Planning tool presents an approach to training land design that systematically integrates training and environmental requirements—enhancing and expanding an installation's training resources. Demonstration sites are at Ft. Hood, TX, Camp Ripley, MN, Camp Bullis, TX, and Camp Guernsey, WY.

Evaluating Ranges for Potential Erosion and Heavy Metals Migration. A computer-based model helps range operators and environmental managers assess the potential for erosion and heavy metals migration on their firing ranges. They can design site-specific proactive solutions to lessen or prevent pollution and minimize the potential down-time for the trainers.

Army Training and Testing Area Carrying Capacity (ATTACC). Trainers and environmental staff developed a model to optimally schedule training activities based on land conditions. This proactive approach to training area use and

management can now factor in present land conditions and potential costs to rehabilitate training areas. The approach can maximize the training land availability and reduce environmental impacts.

### **National Defense Center for Environmental Excellence (NDCEE).**

The Army is the DOD Executive Agent for NDCEE. It was established as the national resource for developing and disseminating advanced environmental technologies. Their mission includes transitioning materials and processes to industry, providing training, and performing R&D to accelerate new technology requirements for DOD. NDCEE technology development efforts include management and operations, industrial base support, and development of a system for disseminating information concerning the technology demonstrated under this program. All services, industry, and other federal agencies leverage research and development efforts being conducted at the NDCEE. This yields savings across the full life-cycle of DOD products. It integrates efforts across the DOD, other federal agencies, industry and academia thereby saving time and money.

NDCEE is demonstrating and validating promising innovative technologies to address key environmental requirements, enhance readiness, improve efficiency, and reduce costs. As such, NDCEE provides an important venue for joint environmental efforts with DOD, EPA, industry, and academia. NDCEE developed the Environmental Cost Analysis Methodology model, a capital investment decision tool used by accountants and engineers to evaluate which technologies provide the best return-on-investment with minimal impact on system performance.

### **EQT Summary.**

The EQT program represents the Army's progressive approach to integrate the spectrum of Army environmental programs. It has a far reaching scope; focusing user requirements, technology developers' capabilities, and senior leadership goals. The

EQT process is firmly based on a sound economic rationale for return-on-investment criteria. Therefore, EQT leapfrogs our execution from project demonstration and validation through technology transfer and exploitation. Leveraging advances in environmental technology will be instrumental in controlling future costs and achieving the Army's environmental stewardship vision.

## **CONCLUSION**

Mr. Chairman and Members of the Committee, more than ever before, I have been able to demonstrate that the Army's environmental program can and does support the training and operations required by our mission and does bring quality of life benefits to soldiers and their families. You have seen evidence of the Army's commitment to do more with less, and the Army is achieving success through greater institutionalization of environmental considerations throughout the total Army. We are increasing partnerships with federal agencies, regulators, and stakeholders to accelerate cleanup solutions and lower costs. We have increased our efficiency and reduced costs by improving business practices, making process improvements, and developing technological solutions with a high return on investment. The results of these efforts are modernizing our operations for the Army of the 21<sup>st</sup> century.

Our program for FY00 will continue seeking ways to reengineer our operations so that the compliance requirements will continue to require a smaller percentage of the military budget. The environmental program is committed to promoting operations that protect the health and safety of our soldiers while we maintain lands that provide realistic training for readiness. At the same time, we recognize our responsibility to be good stewards of the Army's historical and natural resources and to protect the surrounding communities and the environment. We are aggressively looking for more forward-thinking opportunities to integrate environmental management into all aspects of Army operations and decision-making. We protect all lands entrusted to us and focus on management of our ranges and withdrawn lands to ensure access to necessary training to support the Army's core warfighting mission. I will close by praising the many soldiers and civilians directly involved in the Army's environmental program. They are

dedicated and strive to do the best job possible under challenging conditions—People make our programs a success.

Our program is mature and funding levels are stable. Our challenges are still significant. This budget request will allow us to meet our environmental program goals for FY00.