

# Defense Environmental Quality Program

FY 2000 EQ Annual Report to Congress

Who To Contact

Sikes Act

Dept. of the Army  
Budget Summary

Dept. of the Navy  
Budget Summary

Dept. of the Air Force  
Budget Summary

Defense Logistics Agency  
Budget Summary

Other Defense-Wide  
Programs  
Budget Summary

DoD Budget Summary in  
Current and Constant  
FY 2002 Dollars

FY 2000 Projects Greater  
Than \$1.5 Million

Summary of FY 2000  
Environmental Quality  
Fines and Penalties  
Assessed and Paid

FY 2000 Report to Congress  
on the Use of Ozone  
Depleting Substances

DoD Directives, Executive  
Orders, and Instructions

Annual Report to Congress

DEFENSE  
ENVIRONMENTAL  
QUALITY  
PROGRAM

Fiscal Year 2000



# CONTENTS

## CHAPTERS

<i>FOREWORD</i> .....	<i>i</i>
<i>ORGANIZATION AND RESPONSIBILITIES</i> .....	<i>1</i>
<i>ENVIRONMENTAL QUALITY BUDGET</i> .....	<i>3</i>
<i>COMPLIANCE</i> .....	<i>7</i>
<i>POLLUTION PREVENTION</i> .....	<i>17</i>
<i>CONSERVATION</i> .....	<i>31</i>
<i>AMERICAN INDIAN AND ALASKA NATIVE INITIATIVES</i> .....	<i>43</i>
<i>DEFENSE ENVIRONMENTAL COOPERATION</i> .....	<i>47</i>
<i>CY 1999 TOXIC RELEASE INVENTORY REPORT</i> .....	<i>53</i>

## APPENDICES

<i>WHO TO CONTACT</i> .....	<i>A-1</i>
<i>SIKES ACT</i> .....	<i>B-1</i>
<i>DEPARTMENT OF THE ARMY BUDGET SUMMARY</i> .....	<i>C-1</i>
<i>DEPARTMENT OF THE NAVY BUDGET SUMMARY</i> .....	<i>D-1</i>
<i>DEPARTMENT OF THE AIR FORCE BUDGET SUMMARY</i> .....	<i>E-1</i>
<i>DEFENSE LOGISTICS AGENCY BUDGET SUMMARY</i> .....	<i>F-1</i>
<i>OTHER DEFENSE-WIDE PROGRAMS BUDGET SUMMARY</i> .....	<i>G-1</i>
<i>DoD BUDGET SUMMARY IN CURRENT AND CONSTANT FY 2002 DOLLARS</i> .....	<i>H-1</i>
<i>FY 2002 PROJECTS GREATER THAN \$1.5 MILLION</i> .....	<i>I-1</i>
<i>SUMMARY OF FY 2000 ENVIRONMENTAL QUALITY FINES AND PENALTIES ASSESSED AND PAID</i> .....	<i>J-1</i>
<i>FY 2000 REPORT TO CONGRESS ON THE USE OF OZONE DEPLETING SUBSTANCES</i> .....	<i>K-1</i>
<i>DoD DIRECTIVES, EXECUTIVE ORDERS, AND INSTRUCTIONS</i> .....	<i>L-1</i>

# FOREWORD



*Raymond F. DuBois, Jr.  
Deputy Under Secretary of Defense  
(Installations and Environment)*

This report details and celebrates the accomplishments of the Department of Defense's (DoD's) Environmental Quality Program for Fiscal Year (FY) 2000.

As this report is submitted, we mourn the loss of cherished colleagues, both military and civilian, to a terrorist attack on the Pentagon, along with the loss of thousands of Americans and many others from around the world in the attack on the World Trade Center in New York City.

DoD is playing a vital role, together with other Federal agencies, state and local authorities, and our international coalition partners, in the battle against international terrorism. This battle and the defense of our great nation, her people, and her interests at home and abroad, are DoD's core mission.

How do the activities and accomplishments of DoD's Environmental Quality Program reflected in the attached report contribute to this historic effort?

First, the program helps maintain a healthy and productive environment, a critical element of national power. Without productive land, clean water, and healthy air, the United States cannot raise, equip, and sustain forces in the field.

Second, pollution is inherently wasteful of the limited resources available to our Armed Forces. Pollution prevention, the cornerstone of DoD's Environmental Quality Program, reduces costs and waste by improving processes, thereby constantly reducing DoD's negative impacts on the natural world.

Third, environmental stewardship is a reflection of the high ethical ideals of America's fighting men and women. Americans expect and demand from their public servants, civilian and military, a deep and abiding commitment to environmental stewardship. They have not been disappointed. The world's most capable and effective Armed Forces can, and should, operate an environmental quality program that is second to none. No lesser commitment will satisfy the demands of our nation or of our own consciences.

In all three ways—as a means of assuring America's national power, as a sound management strategy for conducting operations, and as an ethical imperative—DoD's robust Environmental Quality Program contributes to our ability to accomplish our core mission of defending American interests at home and abroad from threats, foreseen and unforeseen.

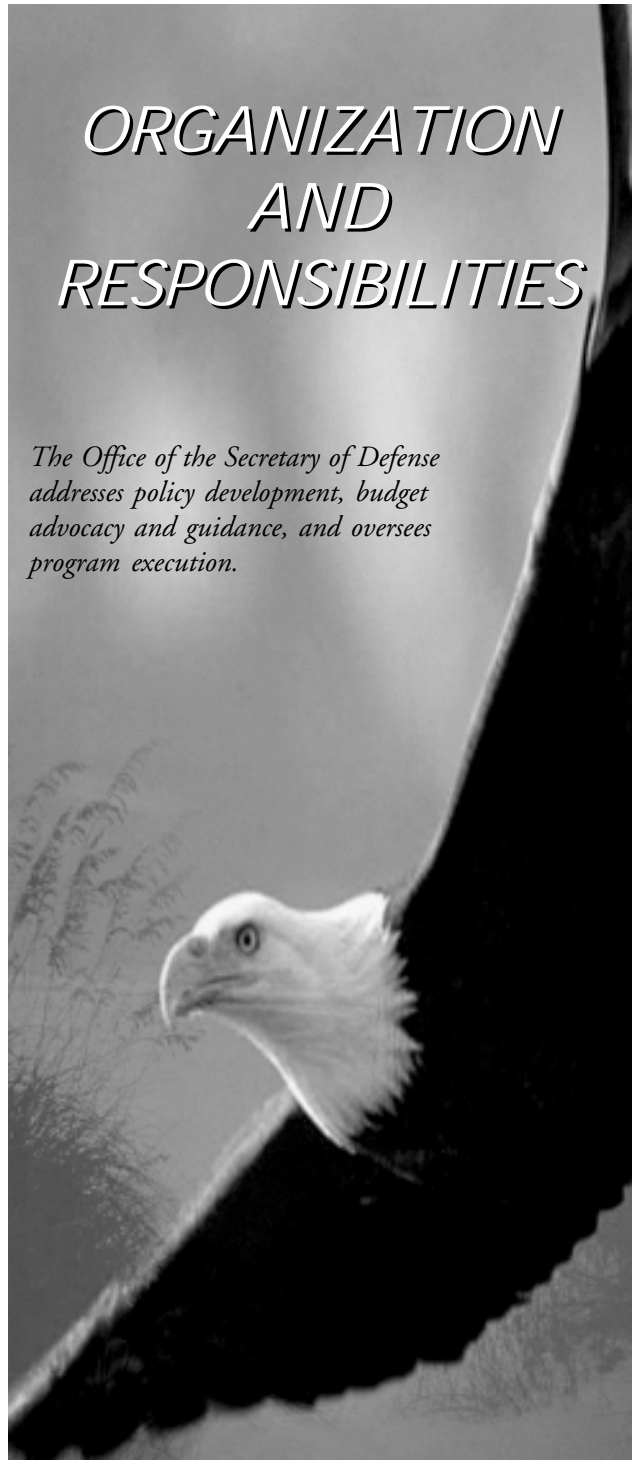
A handwritten signature in black ink, appearing to read "R. DuBois", with a long, sweeping flourish extending to the right.

The Department of Defense's (DoD's) environmental organization consists of three broad tiers that correspond to its major environmental responsibilities. The highest tier is the responsibility of the Office of the Secretary of Defense, the Secretaries of each Military Department, and the Defense Agencies. This tier addresses policy development, budget advocacy and guidance, and oversight of program execution. The second tier is the responsibility of the DoD Component headquarters and the operational major commands. This tier involves policy development, program planning, determination of budgetary requirements, and oversight of program execution. The third tier is the responsibility of the individual installation commanders and addresses program management and execution. Figure 1 illustrates this structure. Appendix A provides contact information for the Office of the Deputy Under Secretary of Defense (Installations and Environment) as well as the environmental office for each DoD Component.

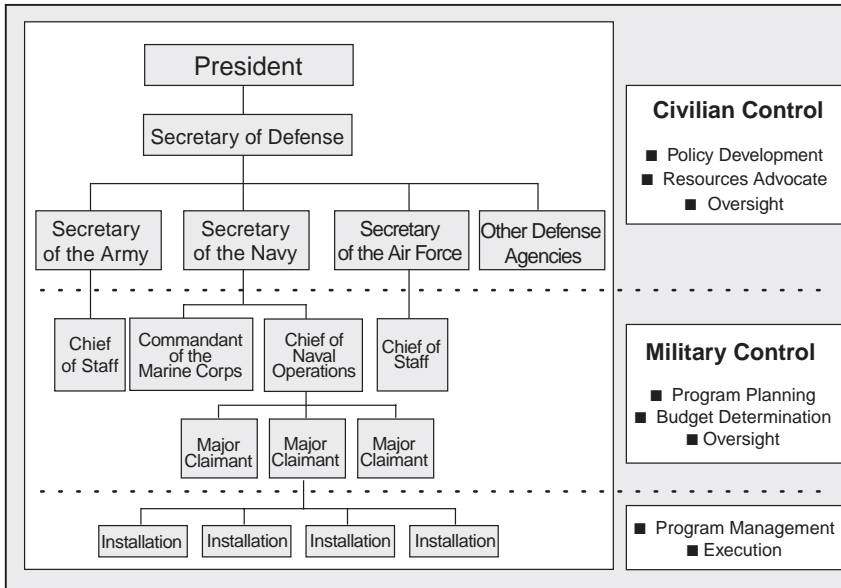
The Defense Agencies, such as the Defense Logistics Agency (DLA), play an important role in DoD's environmental management strategy. DLA is a combat-support agency that provides worldwide logistics support and related services throughout DoD, including supply distribution and inventory management. It procures, stores, and distributes all bulk fuel for DoD and is responsible for the environmental management functions associated with those tasks. DLA is also the disposal agent for hazardous materials and waste. DLA centrally procures, stores, and manages DoD's stockpile of ozone depleting substances for mission-essential uses.

## ORGANIZATION AND RESPONSIBILITIES

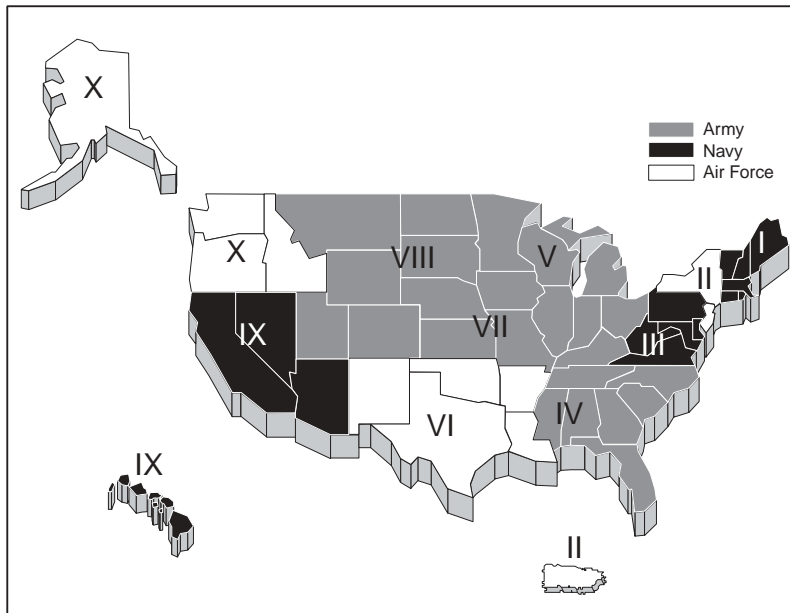
*The Office of the Secretary of Defense addresses policy development, budget advocacy and guidance, and oversees program execution.*



**Figure 1  
DoD Peacetime Support Organization**



**Figure 2  
DoD Regional Executive Agents**



DoD has also assigned regional executive agents for each of the U.S. Environmental Protection Agency’s (EPA’s) 10 regions (Figure 2). In each EPA region, the DoD Component with the largest presence in the region is the executive agent. Each regional executive agent appoints a regional environmental coordinator (REC) who monitors and participates in day-to-day environmental activities within the region. The RECs play a key role in DoD’s environmental quality strategy by conducting outreach and building partnerships with environmental regulators and the public. They also are responsible for ensuring consistent performance and enforcement throughout the region and for reporting regional activities and trends to headquarters.

In Fiscal Year (FY)<sup>1</sup> 2000, DoD spent \$2.1 billion on EQ Program activities.

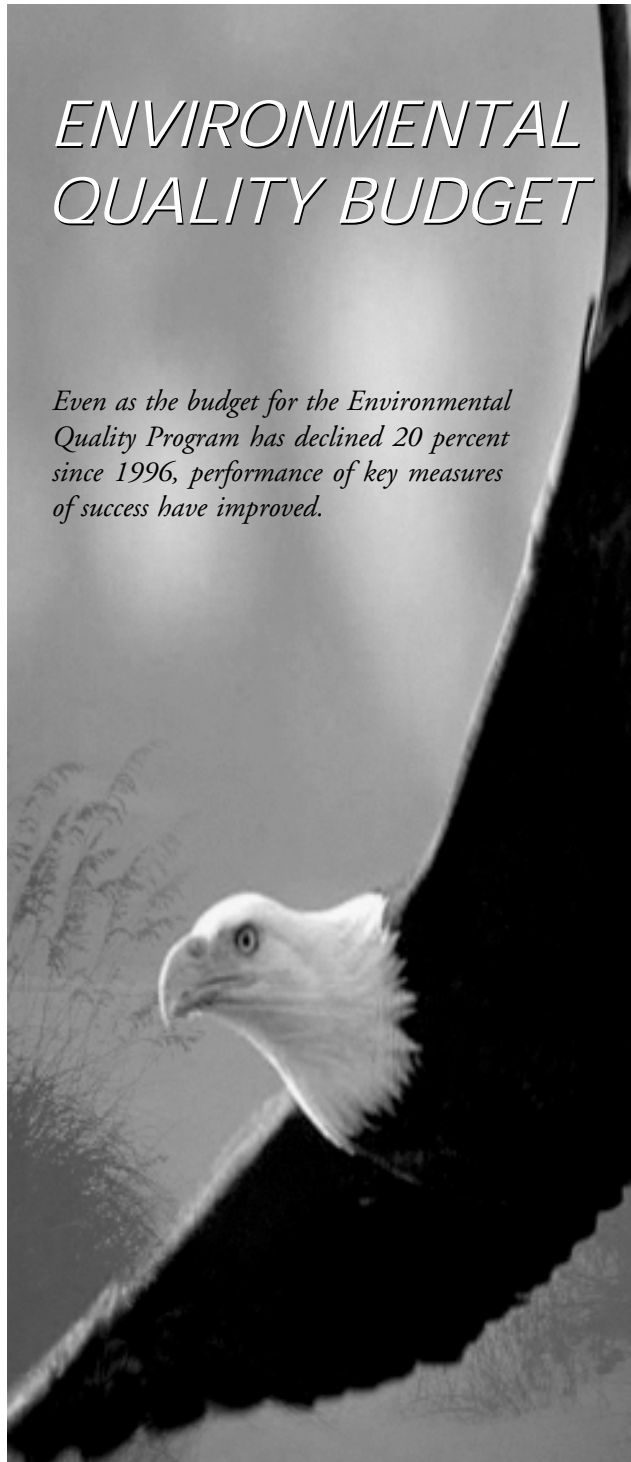
Approximately 79 percent of this amount went toward fulfilling compliance requirements, 13 percent toward conducting pollution prevention activities, and 8 percent toward supporting conservation of natural and cultural resources. The EQ Program spent 52 percent of the FY 2000 EQ budget on one-time projects, or nonrecurring activities, and 48 percent on recurring activities, the relatively constant costs of maintaining EQ programs at DoD installations.

Figure 3 provides a summary of the EQ budget history by pillar. The majority of EQ Program funds are in the operations and maintenance account, defense working capital fund, and procurement account.

The President's FY 2002 budget request for the EQ Program is about \$2 billion, a slight decrease from the FY 2001 appropriated level of \$2.02 billion. This decrease is due in part to previous investments in more efficient infrastructure, pollution prevention, and base closures, which have reduced environmental compliance costs. Figures 3, 4, and 5 illustrate budget trends, showing actual, appropriated, and budgeted funds for various fiscal years and accounts. Appendices C through G of this report include graphs showing FY 1997 through FY 2002 President's budget data, broken down by DoD Component. (For example, to review trends in Navy compliance expenditures, see Appendix D.) Appendix H provides FY 1997 through FY 2002 DoD budget totals in constant FY 2002 dollars.

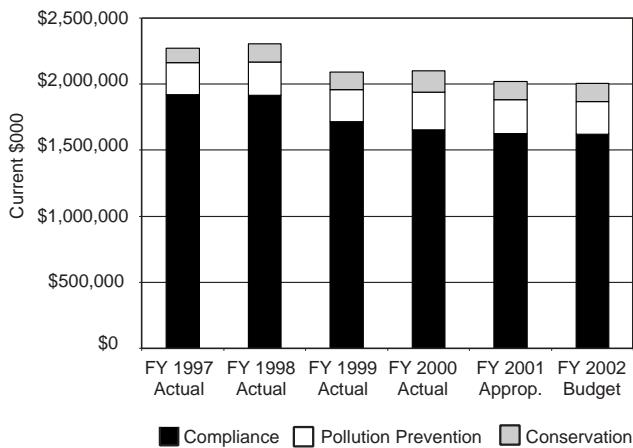
## ENVIRONMENTAL QUALITY BUDGET

*Even as the budget for the Environmental Quality Program has declined 20 percent since 1996, performance of key measures of success have improved.*

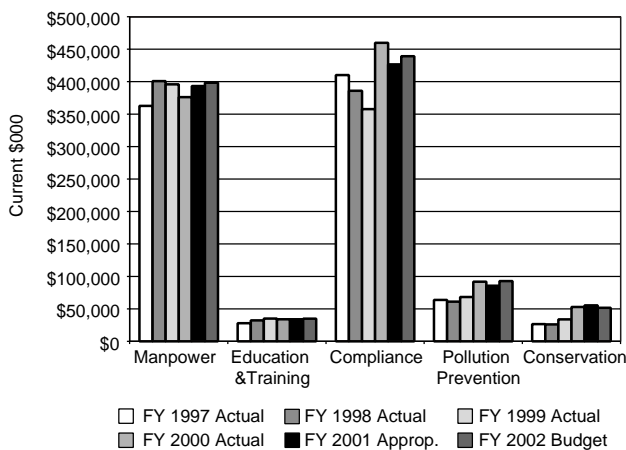


<sup>1</sup> Federal Fiscal Year 2000 covered October 1, 1999 through September 31, 2000.

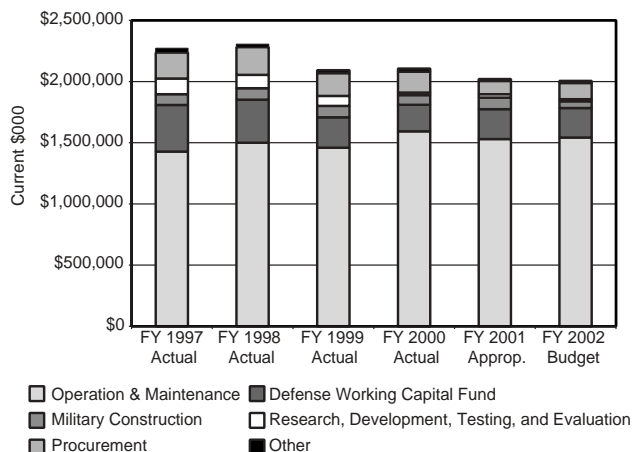
**Figure 3**  
DoD Budget Summary:  
EQ Budget by Area



**Figure 4**  
DoD Budget Summary:  
EQ Recurring Cost



**Figure 5**  
DoD Budget Summary:  
EQ Budget by Appropriation



OVERSEAS ENVIRONMENTAL ACTIVITIES

The FY 2002 budget includes a request for \$224 million for environmental activities that DoD will conduct overseas (Figure 6). This funding is necessary for meeting obligations under standing treaties, laws, contracts, Status of Forces agreements, and DoD policy concerning environmental remediation or compliance activities (Section 2706 (d)(2)(A) of Title 10 United States Code).

For each country where DoD maintains substantial installations, the Department prepares Final Governing Standards (FGS). The Department develops these standards by comparing compliance requirements in host-nation treaties, laws, contracts, and other agreements against DoD’s own Overseas Environmental Baseline Guidance Document. DoD adopts the requirements that are most protective of human health and the environment. In the absence of host-nation environmental requirements, DoD uses the Overseas Environmental Baseline Guidance Document as the FGS for that country.

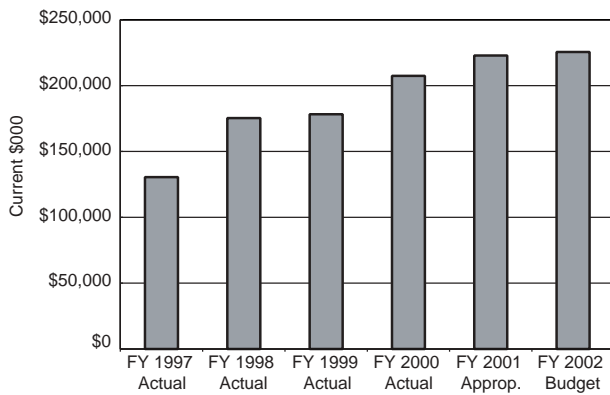
In accordance with DoD Instruction 4715.5, “Management of Environmental Compliance at Overseas Installations,” the DoD Components rely on the environmental standards established for each host country as validated budgetary requirements. (Appendix L contains a list of all directives, executive orders, and instructions referenced in this report.) These requirements are considered functionally equivalent to environmental standards established under U.S.



**Compliance activities** are those projects and activities needed to meet the requirements of DoD Instruction 4715.5, "Management of Environmental Compliance at Overseas Installations" (April 22, 1996), the Overseas Environmental Baseline Guidance Document, and appropriate Final Governing Standards. These activities include projects and activities necessary for alleviating threats to human health or ongoing operations, projects, and activities that are necessary for compliance with applicable treaties and agreements.

**Remediation projects** are those projects needed to meet the requirements of DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas" (February 1998). These include projects and activities that address imminent and substantial dangers to human health and safety that are caused by environmental contamination due to DoD operations and that are located on or emanating from a DoD installation or facility.

**Figure 6  
DoD Budget Summary:  
Total EQ Overseas Budget**



law. The FGS requirements have the highest priority for funding and execution. They receive funding in the current or next fiscal year if failure to comply with them would result in one or more of the following—

- An imminent and substantial threat to human health
- A direct threat to ongoing U.S. operations or U.S. access to an overseas base or installation
- A U.S. default on a standard directly applicable to U.S. overseas operations in a basing agreement, Status of Forces agreement, or other international agreement.

DoD policy requires all other FGS requirements to be programmed and budgeted over the length of the first Program Objectives Memorandum cycle following the effective date of DoD Instruction 4715.5 or the effective date of revisions to the Overseas Environmental Baseline Guidance Document. DoD published a revised guidance document in March 2000.

The overseas environmental impacts of DoD actions are evaluated under DoD Directive 6050.7, "Environmental Effects Abroad of Major Department of Defense Actions." DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas," requires DoD Components, subject to the availability of funding, to take prompt action to remedy known imminent and substantial dangers to human health and safety due to environmental contamination that was caused by DoD operations. The overseas commander of a DoD Component may decide to undertake remediation if such action is necessary to maintain operations or protect human health

**Figure 7**  
**Overseas Budget Expenditures by Area**  
 (Current \$000)

	FY 1999 Actual	FY 2000 Actual	FY 2001 Approp.	FY 2002 Budget
Remediation	\$5,650	\$12,554	\$19,603	\$13,055
Compliance	\$153,612	\$168,560	\$164,054	\$180,277
Conservation	\$3,522	\$5,153	\$5,489	\$3,352
Pollution Prevention	\$15,479	\$17,054	\$31,985	\$26,988
<b>TOTAL</b>	<b>\$178,263</b>	<b>\$203,321</b>	<b>\$221,131</b>	<b>\$223,672</b>

and safety. International agreements may also require the United States to fund remediation.

DoD identified the amounts spent overseas for the past 3 years in 4 areas—Remediation, Compliance, Conservation, and Pollution Prevention. The amounts for each are shown in Figure 7.

#### RESEARCH AND DEVELOPMENT

New technologies are an important tool in helping DoD meet its environmental requirements more efficiently. The President's FY 2002 budget requests \$201 million for research, development, testing, and evaluation to create new technological products to support Installations and Environment Program goals and objectives. Of this amount, approximately \$135 million was requested for direct support of the EQ Program, with \$64 million allocated for pollution prevention, \$57 million for compliance, and \$14 million for conservation research and development activities.

DoD Component research and development funding requests directed to EQ programs for FY 2002 are as follows—

- The Department of the Army requested \$23 million
- The Department of the Navy requested \$66 million
- The Strategic Environmental Research and Development Program requested \$35 million
- The Environmental Security Technology Certification Program requested \$11 million.

The Department of the Air Force did not request any funds for research and development. These investments in technology support the EQ Program but are not part of its budget. Therefore, they are not reflected in Appendices C through G, which summarize EQ Program requirements.

A successful compliance program ensures uninterrupted and cost-effective mission implementation, while protecting the safety and health of DoD personnel and their families. It is also an essential element of DoD's environmental stewardship. The EQ Compliance Program absorbs the largest percentage of the FY 2002 Installations and Environment budget request, at 81 percent.

## PROGRAM PLANNING

The objective of the Compliance Program is to ensure effective and efficient compliance with environmental laws. Our program makes certain that vital mission needs are not put at risk because of regulatory actions resulting from noncompliance. It is also a means of providing clean water, reducing air emissions, and maintaining access to land for training and operations.

DoD works toward continued compliance with existing Federal, state, and local environmental laws. As new regulations develop, DoD responds swiftly by providing guidance for compliance. Figure 8 lists key environmental regulations and any corresponding recent amendments.

## FY 2000 EXECUTION

DoD's Compliance Program budget has declined by 21 percent from FY 1997 to FY 2002, allowing for inflation. At the same time, the Compliance Program has matured, and our performance against key indicators of success has improved each year.

# COMPLIANCE

## COMPLIANCE AND DoD STRATEGY

### *Protecting Readiness Today...*

*Analyzing range encroachment issues and developing a comprehensive plan to address them.*

### *Protecting Readiness Tomorrow...*

*Championing policy development for and coordination of training range and munitions management.*

### *Taking Care of People...*

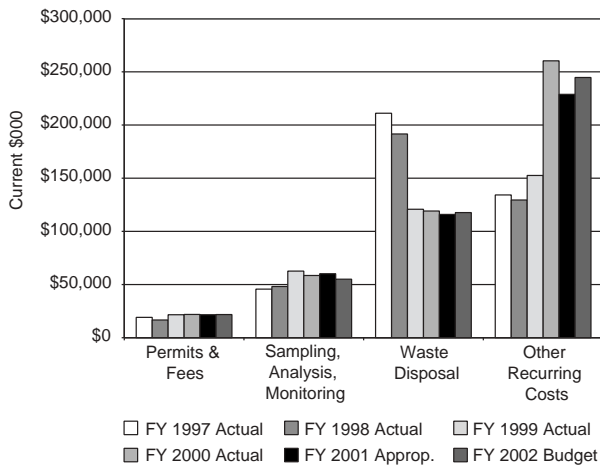
*Submitting Consumer Confidence Reports to ensure that the water that troops and their families drink is safe.*



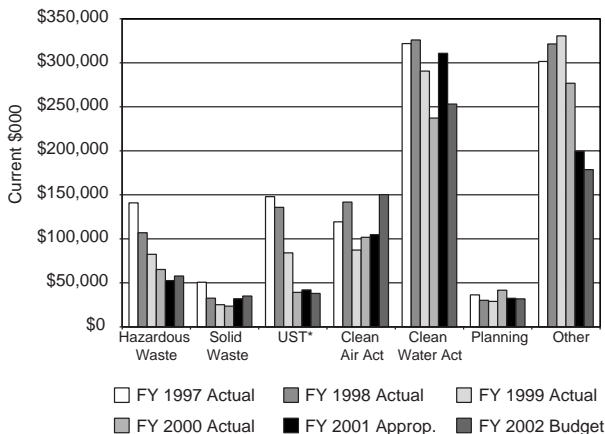
**Figure 8**  
**Key Environmental Laws and Most Recent Amendments**

LAW	DESCRIPTION	MOST RECENT AMENDMENT
Resource Conservation and Recovery Act	Regulates the generation, transportation, storage, treatment, and disposal of hazardous waste.	1986
Clean Water Act	Regulates hazardous water pollutants at their source through National Pollution Discharge Elimination System (NPDES) permits.	1987
Clean Air Act	Regulates hazardous air pollutants at their source and through ambient air quality measures.	1990
Safe Drinking Water Act	Establishes national standards for safe drinking water supply systems in the United States.	1996

**Figure 9**  
**DoD Budget Summary: Compliance Recurring**



**Figure 10**  
**DoD Budget Summary: Compliance Nonrecurring**



\*Underground Storage Tanks

During FY 2000, DoD invested \$460 million on recurring compliance costs (Figure 9). These costs are associated with routine maintenance, monitoring, and management of infrastructure, resources, and hazardous and nonhazardous materials. Note that FY 2000 EQ manpower, education, and training costs, totaling \$410 million, are not included in the Figure 10 totals. Specific examples of recurring costs include—

- Testing of wastewater and drinking water
- Hazardous waste disposal
- Supplies and equipment maintenance and operation
- Air and water permit management
- Clean Air Act inventories and monitoring
- Compliance audits.

DoD continues to increase the use of emerging pollution prevention technologies and practices to reduce recurring compliance costs.

DoD invested \$785 million on nonrecurring compliance costs in FY 2000 (Figure 10).

Compliance with Clean Water Act requirements associated with treatment plants and storm water collection continues to require the largest percentage of nonrecurring funds. DoD employees are working to attain the Secretary of Defense’s goal of privatizing all wastewater treatment plants by September 30, 2003. Throughout this process, DoD continues to work with state agencies to ensure smooth and responsible transitions.

PERFORMANCE

DoD's Compliance Program continues to demonstrate success, as the following performance metrics for FY 2000 illustrate: compliance enforcement actions, fines and penalties, and Natural Pollutant Discharge Elimination System (NPDES) permits.

*Protecting Readiness Today...*

ENVIRONMENTAL DATA QUALITY MANAGEMENT

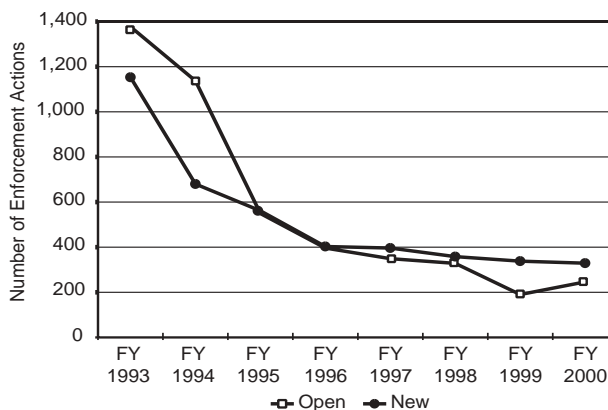
To successfully conduct environmental remediation at its installations and comply with a broad range of environmental regulations and requirements, DoD Components must thoroughly sample and test. The resulting data collected are an important part of environmental decision-making, and sharing lessons learned helps each DoD Component make more effective decisions.

In order to facilitate compliance and standardize environmental sampling and testing requirements, the Office of the Deputy Under Secretary of Defense (Installations and Environment) established the DoD Environmental Data Quality Work Group. The Work Group developed a DoD Quality Systems Manual that provides guidance to the DoD Components for establishing and managing quality systems at commercial and government laboratories performing testing for DoD environmental programs worldwide. The Manual standardizes laboratory quality systems, incorporating both national and international environmental sampling and testing standards. These systems include quality assurance policies and quality control procedures. DoD Components are now assured of the quality of environmental sampling and testing data, enabling them to communicate better and make more informed decisions.

COMPLIANCE ENFORCEMENT ACTIONS

Compliance enforcement actions are at their lowest level since their peak in FY 1993 (Figure 11), even though the number and frequency of state and Federal inspections remain high. Since FY 1993, open enforcement actions have declined 82 percent and new enforcement actions have declined 71 percent. By using internal auditing to identify and correct areas of noncompliance before inspections occur, DoD continually reduced the number of enforcement actions sustained since 1993.

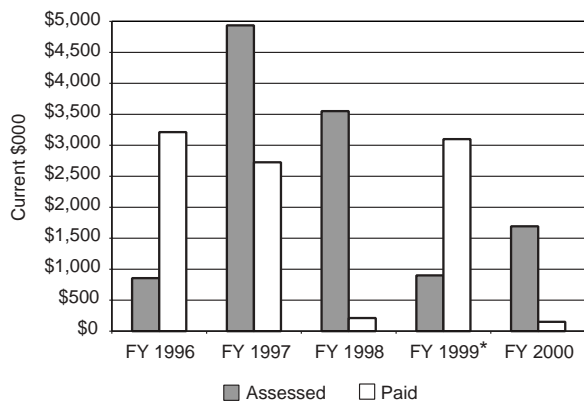
**Figure 11  
Compliance Enforcement Actions**



FINES AND PENALTIES

DoD remains committed to complying with environmental statutes and regulations. In FY 2000, fines and penalties assessed against DoD were less than half of what they were in FY 1998, just 2 years prior (Figure 12). Appendix J provides a detailed analysis of the FY 2000 fines and penalties data and highlights trends over the past 4 years.

**Figure 12  
Fines and Penalties**



\* Does not include an initial \$16 million fine assessed against Fort Wainwright, Alaska.

*Note that supplemental environmental projects in lieu of fines are typically more costly than cash payments. Also, a fine assessed in one fiscal year may not be paid until a later fiscal year.*

Section 8149 of the FY 2000 Defense Appropriations Act required DoD to request and receive statutory authorization from Congress before using FY 2000 appropriations to pay fines and penalties, including supplemental environmental projects (performance of an environmental project in lieu of paying a fine). However, this provision did not affect DoD’s obligation to comply with environmental statutes and regulations.

Although the dollar amount of fines and penalties assessed against DoD increased from 1999 to 2000, the number of fines and penalties assessed decreased during the same period. The reason for this drop is unclear. Although DoD’s efforts to improve performance played a part, it is also possible that regulators issued fewer fines and penalties because they were unsure if they could assess fines or penalties that DoD would pay.

Although Congress required DoD to seek approval before paying any fines or penalties,

the Department did pay some under appropriate circumstances. Appendix J lists those fines and penalties paid and explanations of the circumstances.

The FY 2001 Defense Appropriations Act does not include this statutory provision, allowing DoD to resume paying fines and penalties without congressional approval. The FY 2001 National Defense Authorization Act also requires new, additional reporting by DoD. It requests that DoD compile an expanded fines and penalties report by FY 2002. To comply with this requirement, DoD will provide an historical account of fines and penalties, including an analysis of the basis of the fines and penalties assessed, in next year’s Annual Report to Congress.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITTED SYSTEMS

NPDES permits issued under the Clean Water Act allow their holders to legally discharge particular pollutants from specific outfalls, such as a wastewater treatment plant or sewer. For each of the past 3 years, DoD has achieved greater than 90 percent compliance for its NPDES-permitted systems.

DoD currently holds 1,436 permits for approximately 2,199 systems, including domestic and industrial wastewater treatment plants and storm water treatment systems. In FY 2000, 92 percent of DoD’s wastewater systems were in compliance with their NPDES permits, compared with 95 percent in FY 1999 (Figure 13). There are a variety of factors that

may contribute to a given system's temporary noncompliance with its NPDES permit. Administrative issues, such as late reporting to regulators, rather than system operating errors, constitute the majority of these incidents.

While working to achieve 100 percent compliance with NPDES permits, DoD's Compliance Program also focuses on improving compliance with other Clean Water Act permits, including those regulating discharges to publicly owned treatment works

and other permitted wastewater systems. Figure 14 shows that our compliance rates with these permits also remain high.

In FY 1998, DoD set a goal of devoting at least 15 percent of its Clean Water Act compliance budget to pollution prevention efforts. DoD originally projected that it would reach this goal by 2004. Instead, DoD is on target to meet this goal in early FY 2001—3 years earlier than projected.

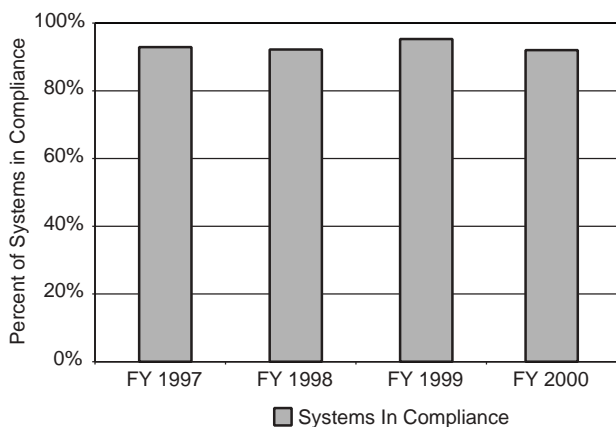
### ACCOMPLISHMENTS

By complying with all applicable laws and regulations, DoD preserves the land, water, and airspace needed for military training; protects the health of its employees and their families; and maintains the facilities in which it operates. The DoD is proud of its accomplishments in these areas, as detailed below.

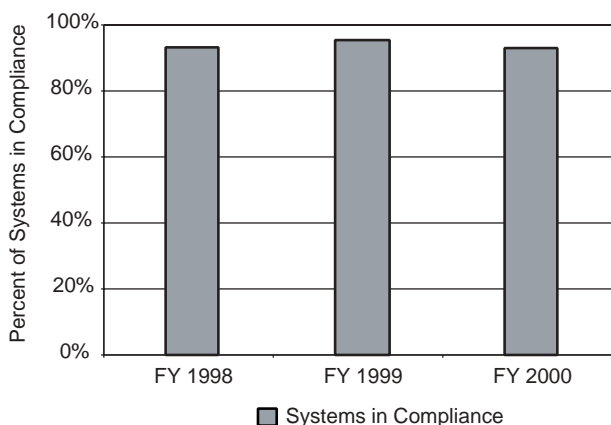
#### SAFE DRINKING WATER ACT CONSUMER CONFIDENCE REPORTS

DoD drinking water systems are crucial to military readiness. Any compromise of the integrity of these systems or the quality of the water supply threatens the health of the men, women, and children living and working on, or visiting, our installations. The 1996 Safe Drinking Water Act Amendments required the publication of annual Consumer Confidence Reports (CCRs), beginning in 1999, to promote public awareness of drinking water quality. By July 1 of each year, operators of all community water systems must provide this

**Figure 13**  
**DoD Compliance with NPDES Permitted Systems**



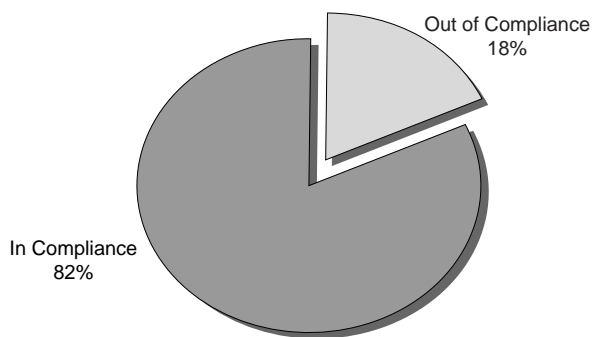
**Figure 14**  
**DoD Compliance with Clean Water Act Permitted Systems**



report on the quality of the drinking water throughout the previous year.

More than 259 of DoD’s drinking water systems, serving 2.2 million people, are subject to CCR requirements. At some point during Calendar Year (CY) 1999, approximately 18 percent of these systems, serving over 500,000 people, were out of compliance with the drinking water requirements (Figure 15). Although the number of systems that fell under the CCR reporting requirements decreased from CY 1998, the number of systems out of compliance increased slightly, highlighting the challenges of maintaining these drinking water systems.

**Figure 15**  
**Drinking Water System Compliance with CCR Requirements**



DoD is committed to protecting the health of our people by providing safe, drinkable water. However, the challenge to do so continues as the drinking water systems age and the infrastructure deteriorates. Interim solutions are now in place to address any immediate health concerns. Where necessary, DoD has developed long-term plans and projects to eliminate

possible future health effects related to the systems that are not in compliance.

IMPROVED MANAGEMENT OF MUNITIONS

DoD’s Operational and Environmental Executive Steering Committee for Munitions (OEESCM) is currently championing policy development for and coordination of training range and munitions management. In FY 1999, the OEESCM participated in the National Munitions Dialogue and published two DoD directives dealing with ranges within and outside the United States: DoD Directive 4715.11, “Environmental and Explosives Safety Management on Department of Defense Active and Inactive Ranges Within the United States,” and Directive 4715.12, “Environmental and Explosives Safety Management on Department of Defense Active and Inactive Ranges Outside the United States.” These directives represent a major step toward establishing policies and assigning responsibility for sustainable use and management of DoD’s active and inactive ranges. The directives also assist in protecting DoD personnel and the public from explosive hazards. Currently, DoD Components are drafting instructions for implementing each directive to achieve full compliance.

In addition, DoD RECs continue to work closely with EPA and individual states to implement the February 1997 Final Military Munitions Rule. This rule identifies when used and unused munitions become solid and hazardous waste and consequently become subject to the Resource Conservation and



Recovery Act. DoD is encouraging states to adopt the 1997 rule, rather than adopting their own separate versions of the rule. If states choose to adopt their own rule, DoD could face many different, and possibly conflicting, rules. To date, 20 states have adopted the Federal rule as written and 14 states have adopted the rule with some state-specific amendments. Other states are currently considering adopting the Federal Military Munitions Rule.

#### CLEAN WATER ACT COMPLIANCE THROUGH STORM WATER REGULATIONS

One facet of the Clean Water Act is the regulation of storm water systems. In October 1999, EPA issued additional regulations in the Storm Water Phase II Rule that now govern NPDES permit requirements for municipal storm water systems and small construction activities. Different components of the rule have different compliance deadlines, with the majority occurring in the next 3 years. DoD activities are on track to comply with requirement deadlines.

DoD participated in the review process for the new regulations and the newly regulated systems. To ensure that all DoD Components meet the requirements, DoD issued Implementation Guidance for Storm Water II Regulations on September 15, 2000.

#### FY 2002 BUDGET AND FUTURE DIRECTIONS

DoD's FY 2002 budget request for the Compliance Program is \$4.7 million lower

than the FY 2001 appropriations. This decrease is due to DoD's ability to increase compliance savings through process improvements that prevent or reduce pollution at the source. This trend will continue as DoD implements new technologies and practices that reduce pollution and, hence, costs.

#### ENVIRONMENTAL MANAGEMENT SYSTEMS POLICY

On April 22, 2000, the President issued Executive Order (E.O.) 13148, "Greening the Government through Leadership in Environmental Management," which requires all Federal agencies to develop and implement environmental management systems (EMSs) by

#### *Protecting Readiness Tomorrow...*

##### NAVY STAYS ON TOP OF NEW REGULATORY DEVELOPMENTS

To stay on top of compliance requirements, the Naval Air Systems Command (NAVAIR) has produced a year 2000 compliance calendar that identifies pending changes in environmental regulations. This calendar lists changes to major regulations, the year the regulation becomes effective, and the status of developing technologies that can aid in complying with the regulations.

NAVAIR has posted the calendar on its Web site (<http://www.enviro-navair.navy.mil/fy2000fr.nsf>) and provides searchable information in three areas: regulation, regulation categorized by process or operation, and technology needs. Anticipating future regulatory changes and their impacts will help ensure compliance and help avert adverse impacts on military operations or readiness.

the end of 2005. Interim steps outlined in the E.O. call for program assessments and pilot studies.

DoD has already recognized the importance of EMSs and has begun to address the issue. By the time the E.O. was issued, DoD was completing a pilot study and was in the midst of assessing existing EMSs at installations. The DoD Components are dedicated to implementing EMSs and are developing policy guidance for their installations. Going beyond the basic EMS requirements, the Air Force is finalizing a more comprehensive environmental, safety, and occupational health management system policy.

In FY 2001, DoD will complete its assessment of its EMS programs. This will help DoD determine how many installation programs are close to meeting EMS goals and where additional guidance is necessary.

#### REVISING POLLUTION PREVENTION AND COMPLIANCE METRICS

DoD strives to achieve outstanding protection of the environment while keeping military readiness as the top priority. In an effort to gauge its success in environmental stewardship, DoD uses measures of performance to assess compliance and pollution prevention.

DoD is now drafting revised pollution prevention and compliance metrics. These revised metrics challenge DoD to be more innovative in its approaches to hazardous waste reduction, safe drinking water protection, clean air and water attainment, air and water pollution reduction, Toxic Release Inventory emissions reductions, and solid waste reduction.

DoD intends to finalize the new metrics early in FY 2002.

#### *Protecting Readiness Today...*

##### MARINE RESERVES GET GREEN

The U.S. Marine Corps Reserves have taken up a new battle. The newly formed Environmental Services Division is tasked with ensuring compliance with Federal and state environmental laws and regulations at more than 185 Marine Corps Reserve Centers around the country. By efficiently investing money to improve compliance, the Marines can dedicate more money and resources to training. The new division will conduct inspections, offer technical assistance, and perform follow-up evaluations.

The Environmental Services Division is also responsible for compliance and hazardous waste disposal during active and reserve component exercises. This Division offer support by setting up areas to store, process, and transport hazardous waste, as well as providing emergency spill response teams and conducting daily environmental compliance inspections. The Division works hard to protect the environment while ensuring that Marines get the best possible training experience.

## SUSTAINABLE RANGE MANAGEMENT

Issued in FY 1999, the *Range Sustainment Report* examines issues that affect range sustainment, such as the Endangered Species Act, and DoD's ability to continue training and preserve military readiness. During FY 2000, the Senior Readiness Oversight Council tasked the Defense Test and Training Steering Group with analyzing range encroachment issues and developing a comprehensive plan to address them. The Steering Group will present the findings to the Council in FY 2001.

DoD has also drafted a *Munitions Action Plan* to identify actions that will help maintain combat readiness through improved environmental stewardship and enhanced explosives safety compliance across the complete munitions life-cycle. Part I of the Plan defines the munitions life-cycle and establishes fundamental principles and overarching DoD strategies for addressing explosives safety and environmental issues. Part II of the Plan establishes specific objectives to improve management of the munitions life-cycle.

This Plan, which DoD expects to release in 2001, is helping DoD define and outline the munitions-related issues it faces. The *Munitions Action Plan* provides common ground to discuss responsible munitions and environmental range management.

## ENVIRONMENTAL JUSTICE

DoD is committed to balancing mission requirements with the environmental concerns

of all communities. In some instances, environmental justice, as embodied in E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," becomes a factor. Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Federal agencies are coming under increasing scrutiny concerning the effects of their activities and operations on minority and low-income populations. As a major Federal agency, DoD must consider whether its proposed actions may have disproportionately high or adverse health and environmental effects on minority and low-income populations. The collective authority for these requirements consists of the following—

- December 10, 1997, Council on Environmental Quality, Environmental Justice—Guidance Under the National Environmental Policy Act
- February 11, 1994, E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"
- National Environmental Policy Act of 1969
- Title VI of the Civil Rights Act of 1964.

The Deputy Under Secretary of Defense (Installations and Environment) is an active participant in the Federal Interagency Working

Group on Environmental Justice. Through the group, DoD works with other Federal agencies to address actions that may have adverse effects on minority and low-income populations.

The Working Group has created an Integrated Federal Agency Environmental Justice Action Agenda. The overall goal of the Agenda is to increase efforts to identify, mobilize, and use Federal resources to benefit environmentally and economically distressed communities. The Agenda seeks to create partnerships between Federal agencies and other stakeholders to promote comprehensive solutions to environmental justice issues.

The Agenda identified 15 model Interagency Environmental Justice Demonstration Projects. On May 15, 2000, the Working Group identified the Bridges to Friendship Partnership at the Washington Navy Yard in Washington, D.C. as one of the demonstration projects, citing it as a model for other agencies.

DoD is dedicated to these efforts and tries to spur innovative approaches to environmental justice issues that go beyond the letter of the legal requirement. Currently, DoD is completing an environmental justice document for military and civilian personnel.

### *Protecting Readiness Tomorrow...*

#### FOSTERING ENVIRONMENTAL JUSTICE: BRIDGES TO FRIENDSHIP

The Bridges to Friendship Partnership is one example of DoD's commitment to making environmental justice an integral part of the military mission. In FY 2000, the Navy partnered with communities, businesses, and the local, and Federal governments to form Bridges to Friendship, an alliance focusing on environmental justice concerns related to the revitalization of the Washington, D.C. neighborhoods next to the Washington Navy Yard.

The Washington Navy Yard will be converting to new uses and is expected to employ more than 5,000 additional military and civilian personnel over the next several years. The area surrounding the Navy Yard includes communities dominated by public and low-income housing and is predominantly African American. The dramatic increase in personnel, the new infrastructure needed to accommodate it, and the cleanup initiatives to support this development presented a serious challenge to the Navy. In order to meet this challenge and implement E.O. 12898, the Navy, through its participation in Bridges to Friendship, is developing job training and identifying employment opportunities for local residents, initiating small business and private sector outreach programs, and incorporating community visions and needs into planning efforts. The Navy's involvement in the partnership has helped DoD efficiently address the cleanup and redevelopment issues associated with the Navy Yard.



Pollution can irreparably harm and interfere with DoD's management of its vital resources—its people, land, and facilities. Correcting or reversing the problems caused by pollution can cost DoD many times the amount of money needed to avoid the problems in the first place.

DoD strives to reduce and prevent pollution at the source instead of employing end-of-pipe solutions to control or mitigate the effects of pollutants. Examples of DoD's efforts include reducing the use of hazardous materials, implementing new recycling techniques, and conserving energy and water.

#### PROGRAM PLANNING

DoD's Pollution Prevention (P2) Program focuses on two key areas, installations and weapons systems. DoD is developing and implementing pollution prevention technologies and processes in both areas to protect vital resources and reduce overall compliance costs.

#### FY 2000 EXECUTION

DoD's FY 2002 P2 Program budget request is 6 percent lower than its FY 1997 budget, allowing for inflation. The P2 Program budget remains relatively stable because pollution prevention is the primary means of achieving compliance (Figure 16). Investments in pollution prevention over the long term reduce compliance costs and threats to DoD's resources.

## POLLUTION PREVENTION

### POLLUTION PREVENTION AND DoD STRATEGY

#### *Protecting Readiness Today...*

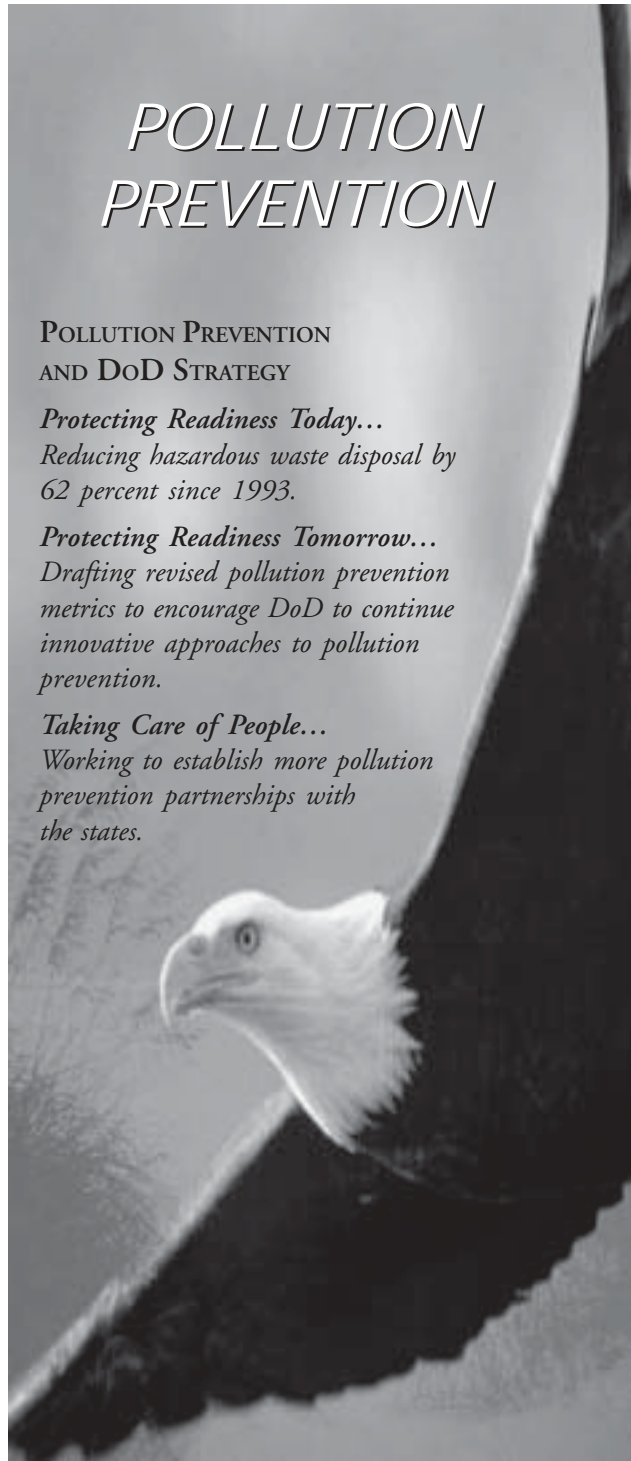
*Reducing hazardous waste disposal by 62 percent since 1993.*

#### *Protecting Readiness Tomorrow...*

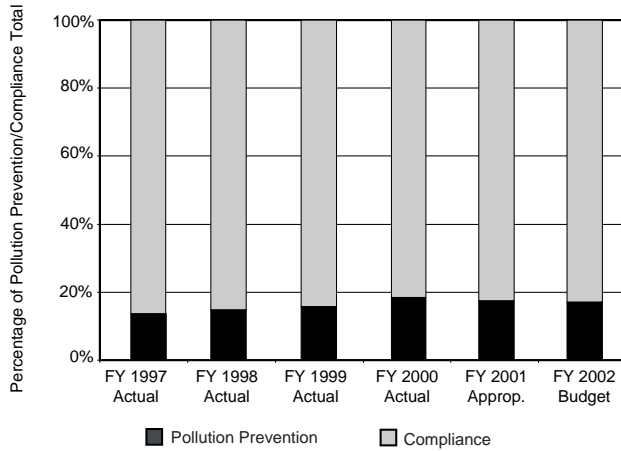
*Drafting revised pollution prevention metrics to encourage DoD to continue innovative approaches to pollution prevention.*

#### *Taking Care of People...*

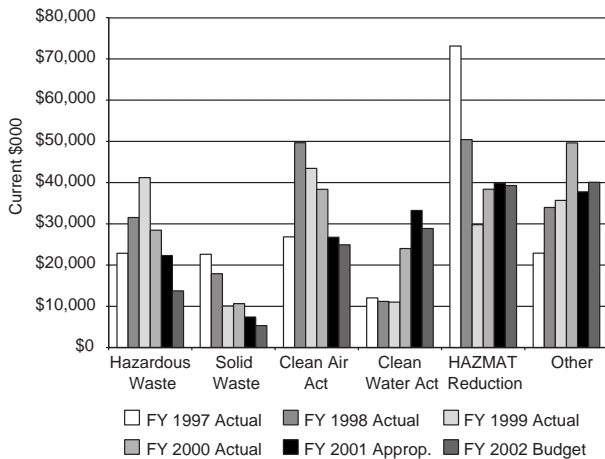
*Working to establish more pollution prevention partnerships with the states.*



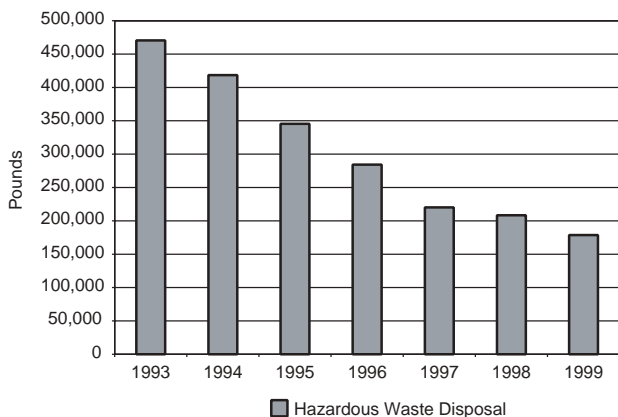
**Figure 16**  
DoD Budget Summary:  
P2 vs. Compliance



**Figure 17**  
DoD Budget Summary:  
Pollution Prevention Nonrecurring



**Figure 18**  
Hazardous Waste Disposal



In FY 2000, DoD invested \$189 million on nonrecurring pollution prevention activities (Figure 17). This represents a 9 percent increase in nonrecurring pollution prevention spending since FY 1999, allowing for inflation.

PERFORMANCE

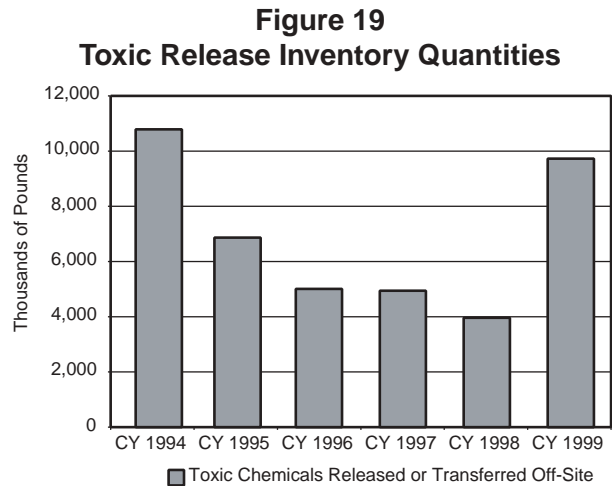
DoD's P2 Program continues to demonstrate increased success, for example, by achieving greater efficiency in reducing solid and hazardous wastes through process improvements. The Department is also finding ways to reduce costs associated with controlling air emissions, which constitute the largest portion of DoD's releases under Toxic Release Inventory regulations.

HAZARDOUS WASTE DISPOSAL

DoD continues to reduce its hazardous waste disposal volumes (Figure 18). The total amount of hazardous waste disposed of declined by 56 percent from CY 1993 to CY 1999 (the last year for which data are available). DoD personnel continue to be diligent in identifying opportunities for reducing hazardous waste generation and are now implementing sweeping changes to improve performance.

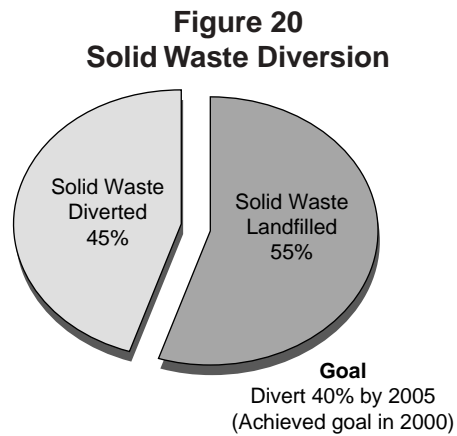
TOXIC RELEASE INVENTORY

In CY 1999<sup>2</sup>, DoD released or transferred 9.7 million pounds of toxic chemicals off site (Figure 19). This number represents a 10 percent decrease from CY 1994 levels, when DoD released or transferred 10.8 million pounds. The Toxic Release Inventory (TRI) is explained in greater detail in the chapter entitled “CY 1999 Toxic Release Inventory Report.”



SOLID WASTE DIVERSION

In 1999, DoD established a new pollution prevention measure of merit, the solid waste diversion rate. The diversion rate is the rate at which nonhazardous solid waste is diverted from entering a disposal facility, such as a landfill or incinerator. The DoD Components report their diversion rates and the cost savings that result from using integrated solid waste management practices (Figure 20).



DoD’s goal is to attain a greater than 40 percent diversion rate by the end of 2005. At the same time, DoD plans to ensure that integrated nonhazardous solid waste management programs provide an economic benefit in comparison to disposal via landfilling and incineration alone. In 2000, DoD attained a 45 percent diversion rate, meeting the goal 5 years early.

COMPLIANCE WITH ANNEX V TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS

Under the direction of the Chief of Naval Operations, the Navy has pursued a rigorous and comprehensive program to comply with the Act to Prevent Pollution from Ships (APPS), which implements Annex V to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). MARPOL, as implemented by APPS, prohibits discharging plastics overboard from ships anywhere in the ocean. However, the use of pulpers and shredders is permitted on Navy surface ships for the purpose of discharging

<sup>2</sup> Although the reporting period for this Annual Report to Congress covers FY 2000 (October 1, 1999 through September 30, 2000), the TRI reporting period covers CY 1999 (January 1 through December 31, 1999).

non-plastic solid waste, such as paper, cardboard, food waste, metal, and glass in MARPOL Annex V Special Areas. Pulpers grind paper, cardboard, and food waste into a biodegradable slurry that is safely discharged into the open ocean. Shredders break up metal and glass into small pieces. The shredded materials are then placed into burlap bags that are discharged overboard and rapidly sink. The three primary special areas that are in effect, and with which the Navy must comply, are the Baltic Sea, the North Sea, and the Antarctic Area. During the past year, there were no discharges from U.S. Navy ships in MARPOL Annex V Special Areas not authorized under APPS.

To comply with MARPOL Annex V, the Navy has equipped all required ships with plastic waste processors. Ships are required to comply with these solid waste requirements as a result of their size and open ocean mission requirement (frigate-size ships and larger). Smaller ships, such as minesweeping ships, coastal patrol craft, and rescue/towing ships, will comply with solid waste requirements through onboard storage and shore disposal. Additionally, the Navy has completed installing pulpers and shredders on 96 percent of the required ships. Nine ships decommissioning by December 31, 2005 will not receive pulpers or shredders. Six additional ships require installation of pulpers and shredders: five will be completed by June 2001; the last will be completed in CY 2002. These ships, as well as those decommissioning, operate under standards published in the Federal Register, which prohibit the discharge of solid waste in MARPOL Annex V Special Areas.



*To comply with MARPOL Annex V, the Navy has equipped all required ships with plastic waste processors and has completed installing pulpers and shredders on 96 percent of required ships.*

### ADVANCED INTEGRATED SOLID WASTE INCINERATION SYSTEM

The Navy is exploring the following technologies that may be feasible for installation and use on warships and that will enable full compliance with MARPOL Annex V Special Areas.

Destroying organic solid wastes using thermal methods (e.g., incineration) is an available commercial technology that may be suitable for Navy shipboard solid waste management. Although the commercial maritime industry uses modern integrated incineration systems, significant improvements in processing efficiency, size, weight, and reliability would be required before installing such systems on a Navy warship. The Navy is investigating commercial marine incineration technology as a basis for its research, development, testing, and evaluation of an advanced solid waste incineration system. If testing is successful, the Navy will install the incinerators on aircraft carriers and large amphibious assault ships. The



Navy will continue to monitor and evaluate technology developments in the private sector, academia, other U.S. government agencies, and foreign navies and will seek to initiate research and development programs for candidate technologies that look promising for installation and use on Navy ships.

### ACCOMPLISHMENTS

Through its P2 Program, DoD protects the health of its employees and their families; preserves the land, water, and airspace needed for military training; maintains the facilities in which it operates; and maximizes the usefulness of funds provided for environmental protection. The Department is proud of its accomplishments in these areas, as detailed below.

#### DoD INSPIRES ITS OWN PRESIDENTIAL AWARDS CATEGORY

In 1993, E.O. 12873, "Federal Acquisition, Recycling, and Waste Prevention," established annual Closing the Circle awards to be given by the White House. The awards recognize Federal employees and their facilities for efforts that result in significant contributions to protecting the environment. In 1998, E.O. 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition," replaced E.O. 12873. The award categories are waste prevention, recycling, affirmative procurement, environmental preferability, model facility demonstrations, and sowing the seeds for change. The 2000 awards also include a new outreach award and recognition for contributions to pollution prevention under E.O. 12856, "Federal

### *Protecting Readiness Tomorrow...*

#### RECYCLING PROGRAM WINS AWARD

The Fort Knox, Kentucky, recycling program won the 2000 White House Closing the Circle Award in the military recycling category for its comprehensive recycling program. The recycling program stresses professional training and community leadership and has four operational goals: conserve natural resources by maximizing diversion of materials from the waste stream, save Fort Knox's appropriated funds, pay operating and capital expenses from program income, and return the maximum amount of dollars for use at Fort Knox.

Professional training in customer service and teamwork effectiveness are two key reasons for the program's success. Trainers from the Defense Logistics Agency provide on-site instruction for the team and sponsor visits to the program's customers, such as paper mills and metal processing facilities. Another strength of the program is its community education and outreach element. Fort Knox partners with local governmental agencies, businesses, and school districts to increase recycling within the region. Through leadership and community outreach, the Fort Knox recycling program sets the standard for protecting people and the environment.



*Installation personnel apply their military discipline to creating extensive recycling programs for everything from newspapers and cardboard to plastic and metal containers.*

**Figure 21  
FY 2000 Closing the Circle Award Winners**

AWARD CATEGORY	INDIVIDUAL AWARD	TITLE OF NOMINATION	TEAM/GROUP AWARD	TITLE OF NOMINATION
Affirmative Procurement	Mr. Robert Cox	Affirmative Procurement of Environmentally Preferable Products at the Pentagon		
Environmental Outreach	Ms. Suzanne Smith	Marine Corps Recruit Depot Recycling	Environmental Management Department	Environmental Outreach at Camp Lejeune
Environmental Preferability Hazardous			Virginia Class Submarine Environmental Management Team	Virginia Class Submarine Environmental Program
E.O. 12856 Individual Challenge	Mr. William Kivela	Air Force Environmental Management Information System		
Model Facility Demonstration			Bachelor Enlisted Quarters 1999 Project Team	Bachelor Enlisted Quarters, Naval Training Center
Recycling Awards	Mr. Paul Bailey	Recycling Manager Model	- Solid Waste Management Program - Fort Knox Recycle Program	- Recycling Program - Fort Knox Recycle Program
Sowing the Seeds for Change			Joint Group Environmental Attributes Team	Greening the Logistics Pipeline: Populating the Federal Logistics Information System with Environment
Waste Prevention			Environmental Division, Code 106.3	Pearl Harbor Bombs Pollution Where it Counts

*Taking Care of People...*

**AIRCRAFT DEICING BECOMES ENVIRONMENTALLY FRIENDLY**

Like commercial jets, military aircraft fly year-round and must be safe to fly in a wide variety of weather conditions. The winter months require extra preparation to ensure flight safety. The DoD Components use chemicals to deice planes and keep them free from snow and ice buildup before takeoff. In the past, these chemicals have remained in the environment as runoff and entered the storm water system.



*Air Force personnel deice a plane. The chemicals used in this procedure will be recycled, preventing them from entering the waste water stream.*

Both the Navy and the Air Force have developed new systems to prevent deicing fluids from entering the local environment.

Ellsworth Air Force Base, South Dakota, installed a drainage and collection system to capture the chemicals and store them for later disposal. The Naval Air Station Brunswick, Maine, developed a similar collection system with a 90,000-gallon storage tank where these fluids can be stored for disposal, treatment, or processing for reuse. These environmentally responsible methods for collecting deicing fluid help maintain military readiness while protecting the health and safety of the local community.

Compliance with Right-to-Know Laws and Pollution Prevention Requirements” (Figure 21).

The numerous awards that military individuals and installations have received are evidence of DoD’s successes in these areas. Recognizing DoD’s many accomplishments, the 2000 Closing the Circle award categories were separated into military and civilian achievements. Having its own category raised the bar for DoD, and we look forward to future environmental innovations.

CLIMATE CHANGE—PROTECTING THE MISSION

DoD is also participating in the international process to improve energy efficiency while preserving military sustainability, operations, and readiness. DoD has been active in the follow-on discussions to the 1993 United Nations Framework Convention on Climate Change. As a participant in these negotiations, DoD has been instrumental in protecting the military mission worldwide. By securing exemptions for multilateral operations and bunker fuels from reporting requirements for national greenhouse gas inventories, DoD has helped ensure continued military readiness. Greenhouse gas emissions from bunker fuels are reported separately from the U.S. national inventories.

During FY 2000, DoD evaluated its progress in achieving greater energy efficiency and outlined future efforts. The resulting publication, “U.S. Department of Defense: Climate Change, Energy Efficiency, and Ozone Protection,” highlights the technological and program successes, worldwide, of all the DoD Components. The document can be found on the Web at: [https://www.denix.osd.mil/denix/Public/Library/Air/Climate\\_Change/dodclimatechange.html](https://www.denix.osd.mil/denix/Public/Library/Air/Climate_Change/dodclimatechange.html).

*Protecting Readiness Today...*

**DoD ELIMINATES THE USE OF OZONE DEPLETING SUBSTANCES**

DoD has made reducing the use and emissions of ozone depleting substances a priority. Such reductions are accomplished through the use of environmentally friendly alternatives to ozone depleting substances and, where applicable, the use of emissions controls.

- Patrick Air Force Base in Florida reduced its use of ozone depleting substances by 81 percent.
- Robins Air Force Base, Georgia, reduced emissions of ozone depleting substances by 99 percent.
- The Naval Sea Systems Command implemented construction design standards on the Navy’s newest ships—the amphibious transport dock *USS San Antonio* (LPD 17), the aircraft carrier *USS Ronald Reagan* (CVN 76), and the attack submarine *USS Virginia* (SSN 774)—that will provide ozone-friendly ships for the 21st century. To eliminate the use of chlorofluorocarbons (CFCs), the LPD 17, CVN 76, and SSN 774 designs employ high-efficiency centrifugal compressor air conditioning plants that use the ozone-friendly refrigerant HFC-134a, the same refrigerant now in use in automobile air conditioners and home refrigerators. In addition, these new ships include refrigeration systems, galley equipment systems, and maintenance and construction materials built without CFCs. In the area of fire extinguishing agent replacement, all uses of halon on these ships have been replaced with new, more environmentally acceptable alternatives, such as fine water-mist systems and the non-ozone depleting gaseous agent known as HFC-227ea.

*Protecting Readiness Today...*

AIR FORCE FIRE TRAINING FACILITY USES CLEAN-BURNING FUEL

At a fire fighting training center at Air Force Plant 42 in Palmdale, California, the goal is to train fire fighters without harming the environment. Traditionally, jet fuel is burned to create live fire-training scenarios. When the jet fuel is burned, it produces lingering clouds of dark smoke which contain hydrocarbons. To avoid producing the clouds of dark smoke and harmful air pollutants, such as particulate matter, SOX and NOX, the plant decided to use liquefied propane instead of jet fuel.

The Air Force is committed to maintaining the highest standards for training and environmental protection. "Transitioning from using jet fuel to clean-burning propane has been one of our top priorities," said Lt. Col. Robert Catlin, Detachment 1 Commander at the plant. "During the planning stages, it was mandatory that this facility operate on propane. We were not willing to negotiate on that design characteristic."



*A vehicle douses propane-fueled flames during a demonstration at the new training center at Air Force Plant 42 in Palmdale, California. By using propane instead of jet fuel, emissions of harmful air pollutants are minimized and/or eliminated.*



*The USS Bonhomme Richard is a large-deck, multipurpose amphibious assault ship that uses a three-pronged approach to conservation, combining proactive maintenance, modifications to standard operating procedures, and innovative equipment changes.*

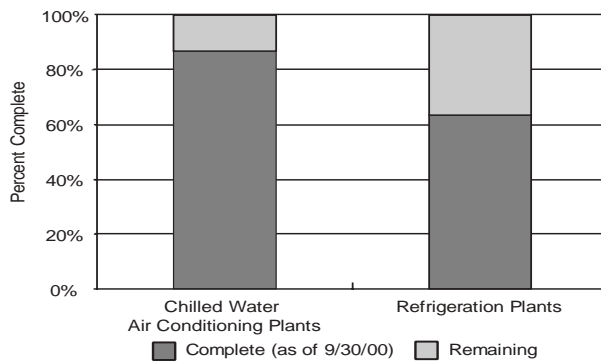
HYDROFLUOROCARBON CONVERSION PROGRAM AND POLLUTION PREVENTION AFLOAT

The Navy's commitment to meeting the requirements of E.O. 13148, "Greening the Government through Environmental Leadership in Environmental Management," is clearly evident in the successful implementation of the Hydrofluorocarbon (HFC) Conversion Program and Pollution Prevention Afloat (P2A) Program. By adhering to tight conversion schedules, the Navy is rapidly replacing the ozone depleting substances chlorofluorocarbon (CFC)-12 and CFC-114 with ozone-friendly HFC-134a and HFC-236fa, as well as accelerating implementation of P2A technologies.

### HFC-134A CONVERSION PROGRAM

Under the HFC-134a Conversion Program, the Navy is converting 925 CFC-12 refrigeration and chilled water air conditioning plants to HFC-134a by 2005. As of September 30, 2000, the Navy had converted 253 of 291 chilled water air conditioning plants, and 403 of 634 refrigeration plants. These conversions make 171 ships CFC-12-free. Figure 22 provides a graphical depiction of the Navy's progress in meeting these goals.

**Figure 22**  
**HFC-134a Conversion Program**



### HFC-236FA CONVERSION PROGRAM

As of September 30, 2000, the Navy had converted 5 ships containing 20 CFC-114 chilled water air conditioning plants, and 2 of 4 plants on one additional ship, to HFC-236fa. Under the current schedule, by 2013 the Navy will convert all 103 surface ships in the program from CFC-114 cooling systems to HFC-236fa systems. Submarine CFC-114 cooling systems will continue to use CFC-114 supplied from these surface ship conversions and from the

#### WHAT IS OZONE?

*Ozone is a bluish gas that is harmful to breathe. Nearly 90 percent of the Earth's ozone is in the stratosphere, which is referred to as the ozone layer. Ozone is formed naturally in the atmosphere by a photochemical reaction. Although ozone is a major air pollutant in the lower atmosphere, it is a beneficial component of the upper atmosphere. Ozone absorbs a band of ultraviolet radiation (UVB) that is particularly harmful to living organisms. The ozone layer prevents most UVB from reaching the ground. Ozone depleting substances, such as CFCs, hydrochlorofluorocarbons, halons, methyl bromide, carbon tetrachloride, and methyl chloroform, are those compounds that contribute to stratospheric ozone depletion. These substances are generally stable in the troposphere (the region of the atmosphere closest to the Earth) and only break down under intense ultraviolet light in the stratosphere (the region of the atmosphere directly above the troposphere). When they break down, they release chlorine or bromine atoms, which then deplete ozone.*

ozone depleting substance reserve until they are retired from service. Figure 23 provides a graphical depiction of the Navy's progress in meeting these objectives.

### POLLUTION PREVENTION AFLOAT PROGRAM

In FY 1999, under the direction of the Chief of Naval Operations, the Navy began carrying out an intensive, accelerated Pollution Prevention Afloat (P2A) Program. The P2A Program applies commercial, off-the-shelf technologies

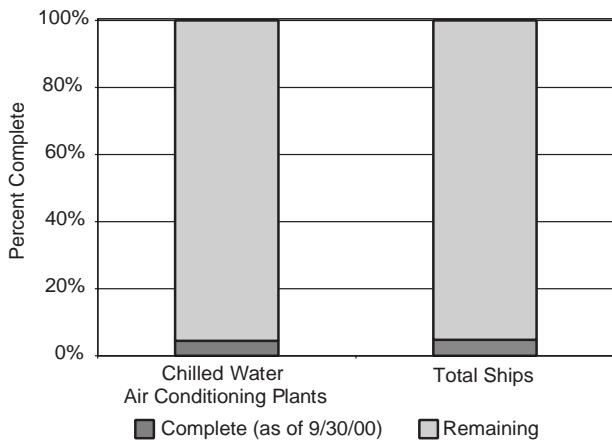
*Protecting Readiness Tomorrow...*

**ARMY CALCULATES THE ENVIRONMENTAL COSTS OF WEAPONS SYSTEMS**

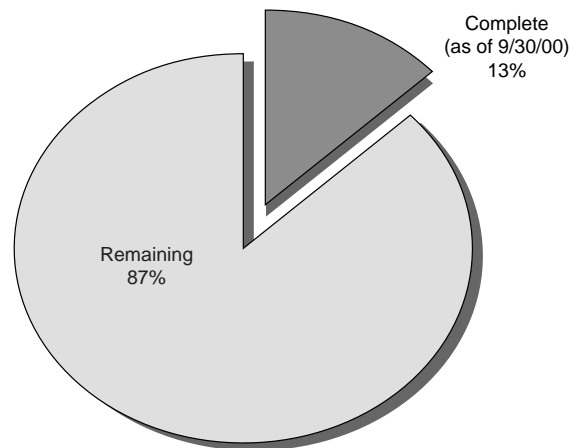
As awareness of environmental impacts has grown, DoD has increasingly assessed the life-cycle of products, and related environmental concerns, such as pollution prevention and the use of recycled materials. Recently, the Army has taken life-cycle assessment to a new level. A team from the U.S. Army Environmental Center is developing methodology for calculating the environmental cost of weapons systems at each stage of their life-cycle. This team has researched and collected environmental cost data on the development, manufacturing, and maintenance requirements for numerous weapons systems.

To date, the team has focused on aviation systems. It now plans to study tracked-vehicle systems. All of the research and methodology will go into a handbook for program managers to use. By developing this guidance, not only can the weapons systems be made environmentally friendly, but they can also be made less expensive throughout their life-cycles.

**Figure 23  
HFC-236fa Conversion Program**



**Figure 24  
P2A Program**



to reduce hazardous material procurement, handling, labor, and disposal costs; and to improve health and safety for personnel. The Navy expects the P2A Program to reduce the need for hazardous materials by 35 percent annually on large ships, such as aircraft carriers; and helicopter-capable ships, such as amphibious assault ships; and by 30 percent on combatants, such as guided missile destroyers. As of September 30, 2000, 21 ships were

outfitted with P2A equipment. The Navy expects to outfit all remaining ships and conclude the P2A Program in FY 2005.

By reducing the need for and, therefore, use of hazardous materials, the Navy expects to reduce offloads (the removal of hazardous materials from a ship) by 31,000 pounds from large ships and by 19,000 pounds from smaller ships. Reducing offloads not only decreases the need

to remove excess hazardous materials from a ship, but also the need to remove items that may contain those materials (such as rags soaked in a hazardous liquid) and the need to complete associated administrative paperwork. The Navy anticipates that all these reductions combined will save 6,570 annual labor hours for large ships and 3,356 annual labor hours for smaller ships. Figure 24 illustrates the Navy's progress in meeting its P2A objectives.

### SHIPBOARD HAZARDOUS MATERIALS CONSOLIDATION AND REDUCTION

In FY 1999, the Navy, under the direction of the Chief of Naval Operations, initiated a Shipboard Hazardous Material List (SHML) Reduction Program to reduce the number of hazardous materials the fleet uses. The program is directed by the Naval Supply Systems Command and the Naval Sea Systems Command, and is executed by the Naval Surface Warfare Center, the Navy Environmental Health Center, and the Navy Inventory Control Point. The SHML is a list of hazardous materials that are authorized for use in shipboard applications. The Navy has instituted the SHML Reduction Program to eliminate multiple hazardous materials used for the same purpose and, where possible, substitute a non-hazardous material. So far, the program has—

- reduced procurement and offloading of hazardous materials

- reduced actual and potential health and safety impacts, without sacrificing performance
- eliminated redundancy in ship stocking systems
- produced safer products.

By providing safer products, health risks to the ship's forces have been reduced, as well as the need to wear personal protective equipment when handling hazardous materials.

Under the initial phase of work, the Navy reduced the allowable number of hazardous material items by 48 percent, from 7,000 items to 3,649. Under the second and final phase, the Navy expects to reduce the number of items further, for a total reduction of 65 percent.

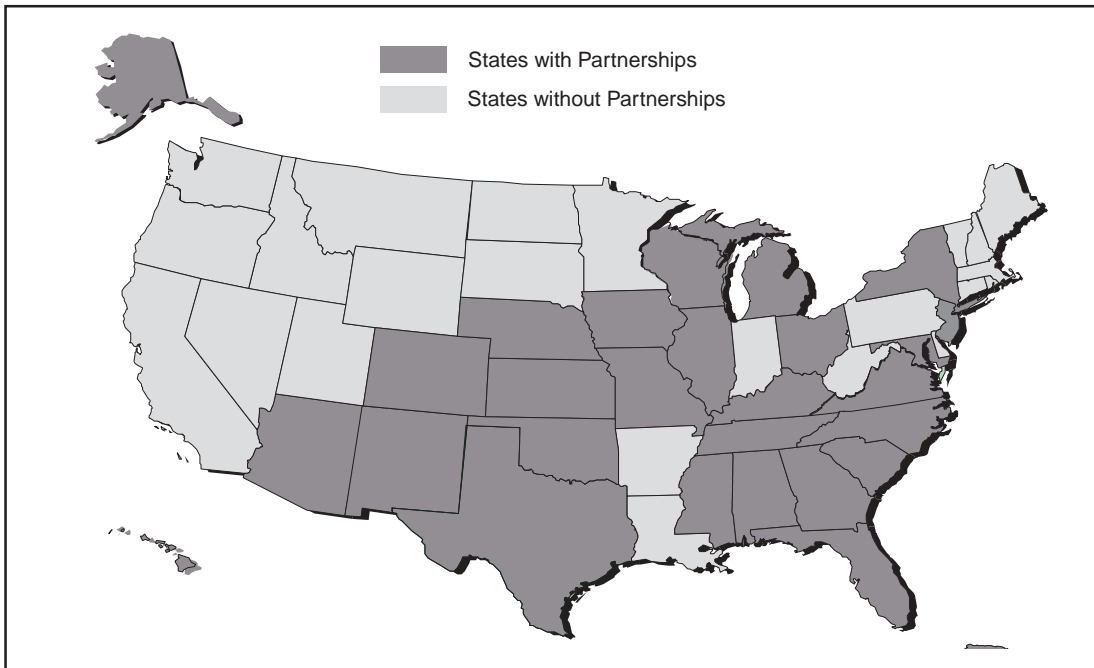
### PROGRESS IN POLLUTION PREVENTION PARTNERING

DoD's RECs have continued to lead the way in establishing pollution prevention partnerships between state agencies and Federal facilities. The members of these partnerships conduct nonregulatory pollution prevention site assistance visits and identify new opportunities for reducing hazardous waste, air emissions, and water usage. DoD currently has a total of 28 partnerships, and efforts continue to establish more in FY 2001. Figure 25 depicts the states that, together with DoD, are making pollution prevention the first choice for environmental management.

### ALTERNATIVE FUELED VEHICLES

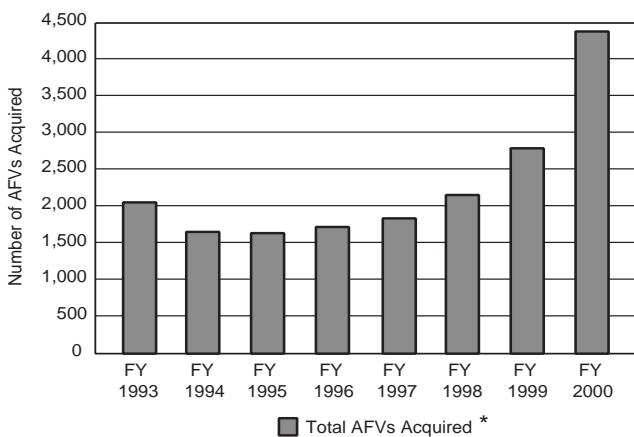
DoD continues to increase its procurement of alternative fueled vehicles (AFVs). The greatest challenge in acquiring AFVs is the availability of

**Figure 25**  
**Pollution Prevention Partnerships**



the types of vehicles the military needs. DoD has made great strides in acquiring these vehicles where appropriate energy supply facilities exist (Figure 26).

**Figure 26**  
**Alternative Fueled Vehicles**



\* FY 1993 to FY 1995 data are skewed by lack of uniform data across DoD.

**FY 2002 BUDGET AND FUTURE DIRECTIONS**

DoD is requesting \$245 million to fund its pollution prevention programs in FY 2002. This amount is \$8.2 million less than was appropriated in FY 2001. The Department recognizes the importance of pollution prevention in addressing environmental problems in the 21st century.

**MUNITIONS AND RELEASE REPORTING**

Starting in 1999, DoD began reporting TRI data from the demilitarization of munitions, including open burning and open detonation (OB/OD). These reports are submitted by the calendar year. DoD submitted CY 1999 data to EPA by July 1, 2000. DoD continually strives



to meet its TRI goals and reduce releases and off-site transfers. In CY 1999, DoD eliminated 77 percent of its toxic chemical releases and off-site transfers from the 1994 baseline. However, this amount does not include newly reportable releases that were the result of demilitarization activities. When the newly reportable releases are factored in, DoD reduced total chemical releases and off-site transfers by 10 percent. The TRI is explained in greater detail in the chapter entitled “CY 1999 Toxic Release Inventory Report.”

#### REVISING POLLUTION PREVENTION METRICS

DoD continues to strive for outstanding protection of the environment, while maintaining military readiness as its top priority. To gauge its success in environmental stewardship, DoD uses measures of performance for compliance and pollution prevention. DoD is now drafting revised pollution prevention and compliance metrics. (The preceding Compliance chapter includes a discussion of this topic.)

#### IMPROVING PROCUREMENT OF ENVIRONMENTALLY PREFERABLE PRODUCTS

DoD continues to meet the requirements of E.O. 13101, “Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.” In March 2000, DoD signed a Memorandum of Understanding and Agreement with the General Services Administration (GSA), a major supporter of and supplier to other Federal agencies.

The agreement between DoD and GSA revolves around cooperation with Planet GSA, whose four principles are Buy Green, Build Green, Drive Green, and Save Green. Each principle involves environmentally smart strategies, such as purchasing products made with recycled materials and promoting energy-efficient measures. In strengthening this interagency relationship, DoD will work to promote Planet GSA among the DoD Components and to raise awareness of these environmental issues through outreach to and education of the general population.

#### IMPROVING RECYCLING PROGRAMS

DoD recognizes the unique opportunities and challenges that exist for recycling at installations. To meet this challenge, installations have developed innovative ways of recycling and reusing materials. To assist installations in operating successful recycling programs, the Department is drafting guidance for DoD Components. *The Guidebook for Operating Qualified Recycling Programs* outlines specific requirements for recycling programs and includes innovative practices. DoD expects the Guidebook to be available in FY 2001.

#### ALTERNATIVE FUELED VEHICLES

The effort to use AFVs continues to present challenges for DoD—from buying to fueling to maintaining the vehicles. DoD can only buy and maintain such vehicles where there is an infrastructure to provide the appropriate alternative fuel. This year we will be expanding

partnerships with fuel providers to increase the fueling infrastructure, which will enable us to buy and operate more AFVs. We also will

work to streamline the reporting system so we can better track vehicle acquisitions.

### *Protecting Readiness Today...*

#### DoD FILLS UP WITH ALTERNATIVE FUELS

Conventional gas vehicles create pollution problems: they contribute to smog and acid rain through emissions of carbon monoxide, nitrogen oxide, and particulates. To reduce these problems, DoD has taken a leadership role in advocating the use of vehicles that use alternative fuels. Many alternative fuels, such as compressed natural gas or an ethanol-gasoline mixture, have almost no particulate emissions and low emission levels of other gases and oxides.

In FY 2000, DoD opened two alternative-fuel stations. The Defense Distribution Depot, San Joaquin, California, opened a compressed natural gas fueling station to support the Depot's 37 natural gas vehicles. DoD opened the second station next to the Pentagon in Arlington, Virginia, offering compressed natural gas and an ethanol-gasoline mixture. The Pentagon station expects to begin dispensing biodiesel in FY 2002.



*The F-117 stealth fighter sits between alternative fuel vehicles at McClellan Air Force Base, California. All 3 vehicles have something in common—they all use “composite” rather than traditional metal materials in their construction, making them lighter and more energy efficient.*

DoD's Conservation Program has two goals: the first is to protect access to the land, sea, and airspace necessary for realistic testing and training exercises; the second is to protect the valuable natural and cultural resources of these areas for the benefit of current and future generations.

The lands DoD manages and trains on are home to important natural habitats for a variety of common and endangered species. More than 200 installations provide habitat for at least 400 plants and animals that are listed on, or are candidates for, the Federal endangered species list. DoD lands also contain more than 100,000 archaeological sites and approximately 2 percent of the military's buildings and structures are considered historic and are listed on or eligible for the National Register of Historic Places.

DoD's challenge is to balance the use of air, land, and water resources for current military readiness with the need to protect and manage those resources for all desired long-term uses. The DoD Conservation Program supports the military mission by providing for the sustained use of land, sea, and air resources; protecting valuable natural and cultural resources for future generations; meeting all legal requirements; and promoting compatible multiple uses of those resources.

## CONSERVATION

### CONSERVATION AND DoD STRATEGY

#### *Protecting Readiness Today...*

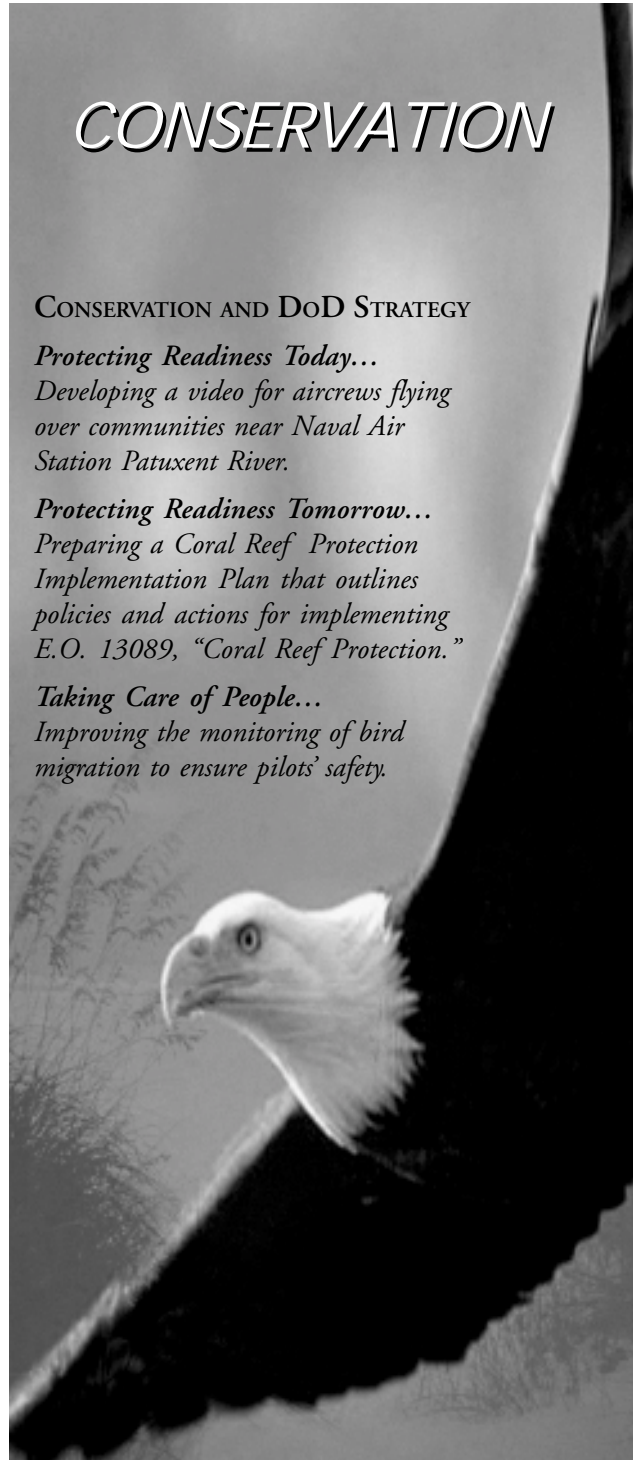
*Developing a video for aircrews flying over communities near Naval Air Station Patuxent River.*

#### *Protecting Readiness Tomorrow...*

*Preparing a Coral Reef Protection Implementation Plan that outlines policies and actions for implementing E.O. 13089, "Coral Reef Protection."*

#### *Taking Care of People...*

*Improving the monitoring of bird migration to ensure pilots' safety.*



PROGRAM PLANNING

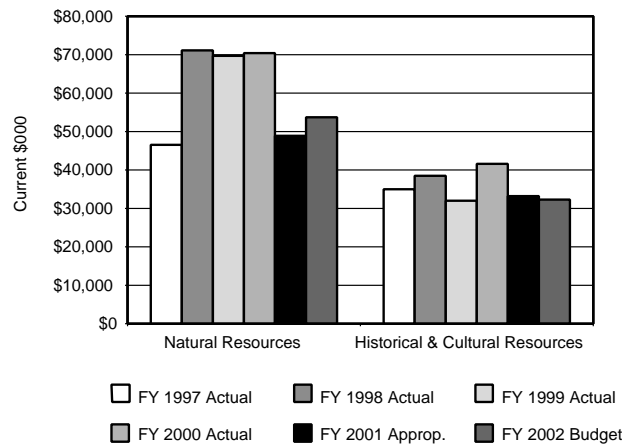
DoD employs sound conservation management practices to ensure that it meets its responsibilities in an efficient manner. Protecting natural and cultural resources contributes to improving the quality of life for DoD personnel and ensures that key training facilities are available to help maintain military readiness. Through implementing conservation strategies, DoD complies with environmental laws while increasing mission flexibility.

FY 2000 EXECUTION

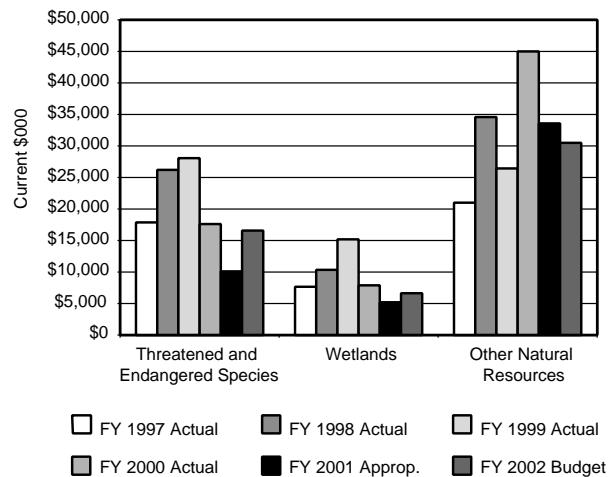
DoD invested approximately \$165 million to support conservation efforts in FY 2000. Approximately \$53 million of these funds was invested in recurring costs, such as habitat monitoring, mitigation efforts, and general maintenance. Approximately \$112 million supported nonrecurring, innovative conservation projects.

In FY 2000, DoD invested approximately \$70 million of the total Conservation Program nonrecurring budget on natural resource initiatives and \$42 million on historical and cultural resource initiatives (Figure 27). Of the \$70 million invested in natural resource protection, \$8 million was invested in wetlands protection—a decrease of 49 percent over FY 1999, allowing for inflation. Expenditures for threatened and endangered species management and protection in FY 2000 were \$17.6 million—a decrease of 38 percent over FY 1999, allowing for inflation (Figure 28).

**Figure 27**  
**DoD Budget Summary:**  
**Natural vs. Historical and Cultural Resources**



**Figure 28**  
**DoD Budget Summary:**  
**Natural Resource Investment by Category**



PERFORMANCE

DoD is meeting its conservation goals through a systematic approach to managing natural and cultural resources. The Department applies an iterative process to identify, evaluate, and manage natural and cultural resources on DoD installations. The process requires DoD to—

- Conduct needs assessments and detailed inventories of resources
- Analyze information about the resources

- Prepare integrated resource management plans
- Implement resource management plans.

The Conservation Program made great strides in protecting the nation’s natural and cultural resources in FY 2000, as the following performance metrics illustrate.

RESOURCE INVENTORIES

Our installations develop and maintain inventories of their natural and cultural resources. These inventories provide valuable information, which is used to develop Integrated Natural and Cultural Resource Management Plans.

Natural resource inventories consist of biological and wetlands inventories. Figure 29 illustrates the significant progress made in FY 2000 toward completing these inventories. DoD has completed almost 85 percent of the biological inventories, compared with 77 percent in FY 1999. Approximately 97 percent of wetlands inventories are complete, compared with 90 percent in FY 1999.

Installations conduct cultural resource inventories to record historical and archaeological artifacts on installation properties. These inventories help installations manage such resources and ensure that important national treasures are protected.

*Taking Care of People...*

CIVIL WAR ERA SUBMARINE *H.L. HUNLEY* RAISED

On August 8, 2000, the Confederate submarine *H.L. Hunley* was raised from the bottom of the harbor in Charleston, South Carolina—136 years after it sank. The *H.L. Hunley* sank with a crew of 9 on February 7, 1864, shortly after blowing up the Union blockade ship *USS Housatonic*. Nicknamed the “South’s secret weapon,” the small submarine was a leader in the Civil War arms race. Although it was built by some of the best engineers of the time, it was never commissioned in the Confederate Navy.

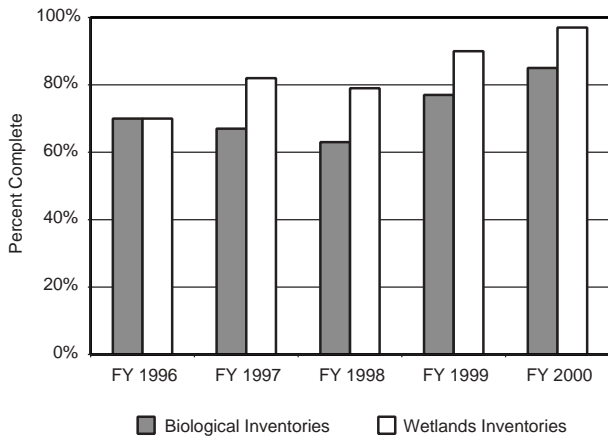
Led by a team of archaeologists from the Underwater Archaeology Branch of the Naval Historical Center in Washington, D.C., the project to raise the *Hunley* was truly a team effort. Organizations participating in the recovery also included the National Park Service; the South Carolina Hunley Commission; the South Carolina Institute of Archaeology and Anthropology; Friends of the Hunley; and Oceaneering, one of the world’s largest deep water salvage and recovery companies.

The project to conserve the *Hunley* is expected to last 7 to 10 years. Under an agreement between the Navy and the state of South Carolina, the Navy will retain ownership of the vessel and its artifacts, and South Carolina will have the right to display them.

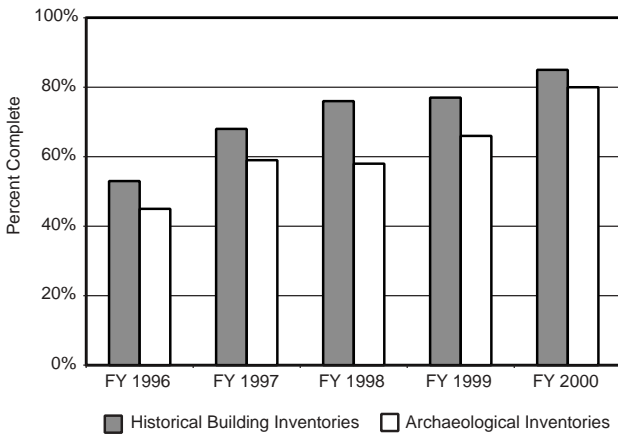


*A view of the recovered H.L. Hunley from the propeller end.*

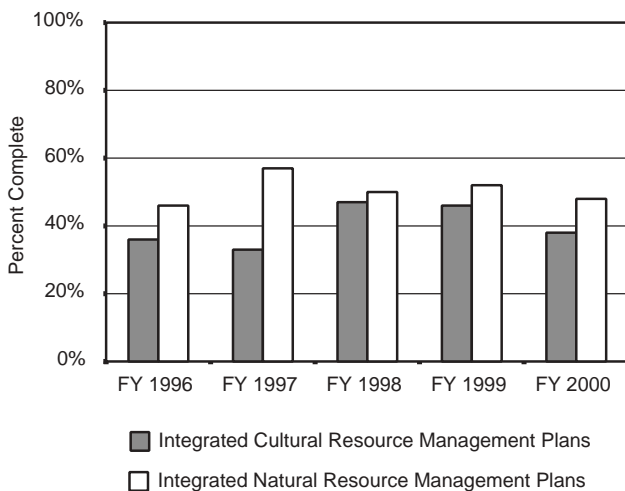
**Figure 29**  
**Natural Resource Inventories**



**Figure 30**  
**Cultural Resource Inventories**



**Figure 31**  
**Cultural and Natural Resource Management Plans**



They also help installation commanders comply with laws, such as the National Historic Preservation Act. Figure 30 illustrates DoD installations' progress in completing cultural resource inventories. Almost 80 percent of the archaeological inventories are now complete, compared with 66 percent in FY 1999. Work toward completing the historical building inventories is also moving forward. Those inventories are now 85 percent complete, compared with 77 percent in FY 1999.

CULTURAL AND NATURAL RESOURCE MANAGEMENT PLANS

DoD installations are required to prepare Integrated Natural Resource Management Plans and Integrated Cultural Resource Management Plans. According to the Sikes Improvement Act of 1997 (described in more detail in Appendix B), DoD must complete all Integrated Natural Resource Management Plans by November 2001. Figure 31 illustrates the progress that installations are making toward meeting this target. DoD has completed 48 percent of its Integrated Natural Resource Management Plans and 38 percent of its Integrated Cultural Resource Management Plans.

ACCOMPLISHMENTS

Through its Conservation Program, DoD protects the health of its employees and their families; preserves the land, water, and airspace needed for military training; maintains the facilities within which it operates; and maximizes the use of funds provided for

environmental protection. The Department is proud of its accomplishments in these areas.

EXPANDING PARTNERSHIPS TO  
IMPROVE STEWARDSHIP

DoD is actively involved in two partnerships: Partners in Flight (PIF) and Partners in Amphibian and Reptile Conservation (PARC). Both programs give DoD the opportunity to work with Federal, state, and local agencies; educational institutions; and nongovernmental organizations to enhance conservation efforts on DoD installations.



DoD joined PIF in 1991. Through this program, DoD partners with more than 110 agencies, institutions, and organizations to conserve

neotropical migratory birds. Neotropical birds breed in the United States and Canada, but spend the winter months in the tropical regions of Latin America.

PIF was initiated to help stem and reverse declining populations of neotropical migratory birds. The program offers a coordinated framework for integrating the management of neotropical migratory birds into existing natural resource and land management programs consistent with the military's mission. DoD's strategy focuses on inventory, on-the-ground management practices, education, and long-term monitoring to determine changes in bird populations at DoD installations. Being part of this partnership helps DoD better assess mission impacts on an installation-specific scale, as well

as on a regional scale. The partnership has improved long-term planning and promotes better integration of mission and resource requirements.

DoD has accomplished many noteworthy projects since PIF began, including—

- Support for the Colorado Bird Observatory to develop a neotropical migratory bird prioritization scheme
- Establishment of stations on DoD installations throughout the country to monitor avian productivity and survivorship
- Development of bird lists and brochures for selected DoD installations to support the Watchable Wildlife Program
- Studies to determine the effects of timber harvesting and other land management and military impacts on neotropical migratory bird habitat
- Wetland and other habitat enhancement projects to benefit neotropical migratory birds.

The other partnership in which DoD is actively involved is PARC. Created in 1998, PARC was designed to promote sound conservation and management of native U.S. herpetofauna (reptiles and amphibians) and conduct educational efforts to raise public awareness of the conservation needs of herpetofauna. PARC's mission is to conserve herpetofauna and their habitats as integral parts of the ecosystem and culture through communication, cooperation, and coordinated public-private partnerships. The diversity of participants

makes PARC the most comprehensive conservation effort ever undertaken for amphibians and reptiles.



Although PARC was initially developed with a focus on the southeastern United States (the region with the country's highest herpetofaunal

biodiversity), interest has developed in other regions of the United States and beyond, including Mexico and Canada, as the initiative has gained attention.

DoD's involvement with the PARC partnership centers on its *Regional Strategies for Managing Threatened, Endangered, and Sensitive Species on DoD Lands*. As part of a larger project designed to manage threatened, endangered, and sensitive species on DoD lands in the southeastern United States, the U.S. Army Engineer Waterways Experiment Station is developing animal species profiles with funding from the DoD Strategic Environmental Research and Development Program. The primary objectives are to develop strategies for assessing and managing these species and their habitats, emphasizing methods that apply collectively to several species instead of a single species.

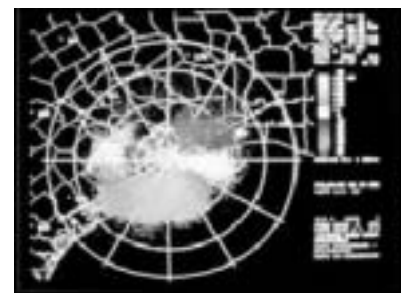
#### USING RADAR ORNITHOLOGY TO MONITOR BIRD MIGRATION

Radar ornithology is the use of weather surveillance radar to track migrating birds and monitor their habits. To reduce the number of

bird strikes by military aircraft, DoD has been examining the effectiveness of using Doppler weather surveillance radar to detect, quantify, and monitor migrating birds. The project is funded through DoD's Legacy Resource Management Program in partnership with the Department of Biological Sciences at Clemson University.

Between 1990 and 1997, almost 150 new Doppler weather surveillance radars were installed around the country. DoD can detect important migration stopover areas within 60 nautical miles of each station. The data are particularly important to land managers at military air stations where bird-aircraft collisions threaten lives and cost millions of dollars in damage every year. U.S. Air Force pilots report more than 2,600 bird strikes each year. Since 1985, aircraft-wildlife (bird and mammal) collisions have destroyed 23 U.S. military aircraft and damaged countless others.

The newest weather surveillance radar, WSR-88, or NEXRAD (Next Generation Radar), is ideal for studying bird migration. It can be used to map geographical areas of high bird activity (stopover, roosting, feeding, and breeding) and can provide information on the quantity, general direction, and altitudinal distribution of



*Taken from a WSR-88D unit in Texas, this image shows thousands of migrating songbirds arriving over the Gulf of Mexico. The circles on the grid are in 30 nautical mile increments. The image indicates that the arriving migrant birds are landing.*



*Taking Care of People...*

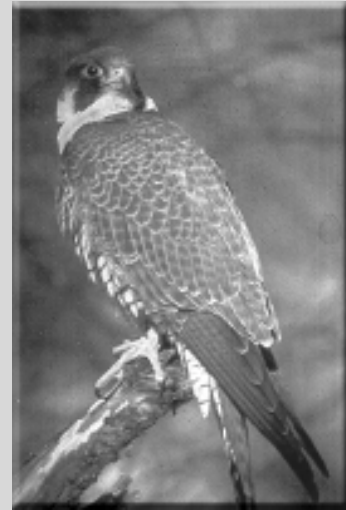
## AIR FORCE—FWS PARTNERSHIP HELPS PROTECT THE PEREGRINE FALCON AND OUR PILOTS

The peregrine falcon (*Falco peregrinus*) has special meaning for the U.S. Air Force. Not only is it the mascot of the U.S. Air Force Academy, but the F-16, one of the Air Force's top fighter aircraft, is nicknamed the Fighting Falcon. Alaska is important to both the falcon and the Air Force. It is the only state where all three North American subspecies of the peregrine falcon nest, and, from a military perspective, it is strategically located near the polar routes between Europe, Russia, and North America.

Since the early 1980s, the Air Force and the U.S. Fish and Wildlife Service (FWS) have worked together to minimize adverse impacts on the peregrine falcon in Alaska. In the early 1990s, Air Force training activities in Alaska increased significantly, much of which involved low-level, high-speed flights, a combination with the potential to negatively impact many wildlife species, including nesting falcons.

To minimize the potentially harmful impacts of such training, the Air Force and the FWS identified major peregrine falcon nesting areas in the proposed training locations. The Air Force then agreed to a protective no-fly zone of 2 miles horizontal distance from, and 2,000 feet vertical distance above, nest level in dense nesting areas. In addition, going beyond statutory requirements, the Air Force agreed to monitor nearby peregrine populations outside the protected area. Monitoring ensures that the protective zone minimizes impacts in the densest nesting areas and that loss of nestlings in the unprotected areas is not substantial. Since 1995, these monitoring efforts have indicated that the protective zone provides adequate protection in the densest nesting areas and that loss of nestlings in unprotected areas is below anticipated levels.

The FWS and the Air Force continue to work together to review Air Force activities and to minimize or eliminate potentially negative impacts on peregrine falcons. As a result, by 1999, the falcons had recovered to the point that the FWS could remove it from the endangered species list.



*The peregrine falcon can dive at speeds of up to 200 miles per hour. The falcon declined in the 1960s due to the use of the pesticide DDT. After it was banned, the population rebounded.*

birds in flight, all of which have an impact on military aviation training. This system allows real-time monitoring of migratory movements throughout the United States and ultimately can produce maps of migration patterns for spring and fall, the major migration seasons.

Such tracking not only improves military flight safety, but it also improves the conservation of migratory birds on military lands. Although there are now only a few WSR-88 sites around

the United States, more are scheduled for installation over the next 5 years. Many of these new units will be on DoD installations, providing an opportunity to collect site-specific data on bird movements and use of DoD lands.

## PROTECTING THREATENED AND ENDANGERED SPECIES

Because DoD manages more than 200 installations, covering 25 million acres of land,

*Taking Care of People...*

ARMY EDUCATES ELEMENTARY SCHOOL STUDENTS ABOUT  
THREATENED AND ENDANGERED SPECIES

Based at Fort McPhearson, Georgia, the U.S. Army Forces Command (FORSCOM) coordinates training of Army deployable forces on about 2 million acres of land across the United States. FORSCOM also has aggressive and effective programs to manage habitat for the recovery of Federally listed threatened and endangered species and other wildlife located on these lands.

FORSCOM recently created a computer-based program entitled "Wildlife Success Stories and Wildlife in Trouble" to teach elementary school students about threatened and endangered species management plans on Army installations. Released in 1999, the program targets third grade students at schools close to Army installations. The Wildlife Stories Program is educational and entertaining; it features six species that are threatened or endangered and six species that illustrate past success. By providing elementary school students with the facts on threatened and endangered species, FORSCOM aims to enhance understanding of the importance of wildlife management on Army installations across the United States.



*Whitetail deer are one of the most numerous wildlife species in the United States today, with an estimated population of 15 to 20 million. They are important prey for cougars, grizzly bears, and wolves.*

we play a significant role in protecting the 400 Federally listed threatened and endangered species of plants and animals located on these lands. The DoD Components have achieved several significant achievements in this area.

- On Army lands, one of these endangered species is the red-cockaded woodpecker (*Picoides borealis*). Through innovative habitat management programs and the efforts of environmental staff at several installations, the Army has played a critical role in the recovery of this species. In 1993, the red-cockaded woodpecker population at Fort Jackson, South Carolina, was estimated to be 39 birds, living in 13 clusters.

Through management activities such as prescribed burning, mid-story hardwood control, artificial cavity construction, and translocation, the population increased to approximately 68 birds in 22 clusters. By the end of the 1999 red-cockaded woodpecker breeding season, there had been a 50 percent increase in the number of nests and a 13 percent increase in the number of active clusters.

- At the U.S. Naval Magazine, Indian Island, Washington, efforts have been successful in protecting the bald eagle, a species with particular symbolic importance to the United States. In 1993, the island had 3

active nests, producing 4 young eaglets. By 2000, there were 7 active nests producing 10 young eaglets. The installation successfully integrated support for bald eagle recovery into day-to-day operations, military construction, outdoor recreation, security, community events, and public relations.



*Red cockaded woodpeckers are endangered because open forests with large, old pine trees have been replaced by forests with younger, smaller pines. Periodic natural fires, needed to control the underbrush and keep the pinewoods open, have been suppressed.*

- The U.S. Marine Corps also has a special responsibility for protecting threatened and endangered species, particularly on its installations in Hawaii, where 25 percent of U.S. endangered species are found. Since 1980, activities at Marine Corps Base Hawaii have more than doubled the number of Hawaiian stilts (one of Hawaii's four endangered waterbirds) on the base, from about 60 to 130. Nearly 10 percent of Hawaii's total estimated stilt population is found on the installation.

All of these conservation efforts have resulted in successful outcomes for the species of concern. So far, the Department has generally managed to meet its continuing need for realistic training at the same time.

Although these examples show how potential impacts from threatened or endangered species were accommodated, any future operational restrictions imposed to account for the species and its habitat will detract from the full operational capabilities of our Armed Forces. The cumulative effects of additional restrictions associated with the Endangered Species Act, and other matters that encroach upon the military's ability to adequately train forces, will degrade mission capability and readiness, increase infrastructure support costs, and further put at risk our Soldiers, Sailors, Marines, and Airmen who stand at the frontlines of our national security efforts.

#### FY 2002 BUDGET AND FUTURE DIRECTIONS

The President's FY 2002 budget request includes \$138 million for DoD conservation initiatives. We see our investments in conservation as investments in the future.

DoD plans to further its Conservation Program through innovative efforts that embrace ecosystem management principles. We accomplish this by evaluating our ecosystem management policy implementation and increasing outreach to and coordination efforts with the public and other Federal and state agencies.

*Protecting Readiness Today...*

**NAVAL AIR STATION DEVELOPS AIRCREW AWARENESS TRAINING**

Over the past several years, military ranges and the activities conducted there have come under increased public scrutiny. The Naval Air Station (NAS) Patuxent River, Maryland, has taken the initiative in raising awareness about environmental and encroachment issues in the operational community. In response to comments from the area's rapidly expanding population, the NAS created *Aircrew Awareness in the Patuxent River Complex*, a new video containing vital information for aircrews flying in the Chesapeake Test Range.

As the population surrounding the NAS has increased, so has sensitivity to supersonic flight, low-level aircraft, and repetitive noise. The video familiarizes aircrews with the Patuxent River Complex and how their actions contribute to the supportive relationship between the NAS and the community. It encourages aviators to be vigilant in conducting missions so that they have minimal impact on residents; that means avoiding flight paths near schools, churches, and houses whenever possible. After viewing the video, aviators receive a fact sheet for their flight books that includes video highlights, a map of the test range, and a list of commonly used radio frequencies. This video will help the NAS accomplish its military mission with minimal impact on the surrounding communities.

*Aerial view of Naval Air Station Patuxent River and the surrounding community.*



**ENSURING CONTINUED ACCESS TO TEST AND TRAINING LANDS**

Over the past decade, DoD has become increasingly concerned with land, sea, air, space, and frequency encroachment on its test and training ranges. Such encroachment poses a serious threat to DoD's efforts to ensure high-quality and realistic test and evaluation (T&E) and training. Various encroachment issues have placed a burden on DoD's ability to conduct the realistic air, ground, and naval training and testing essential to maintaining readiness. These include compliance with environmental regulations; competition for air, land, and sea space; erosion of DoD's frequency spectrum; and urban growth around previously isolated ranges.

DoD's Defense Test and Training Steering Group is analyzing range encroachment and developing a comprehensive plan. The Plan will be a strategic framework detailing an effective process for addressing key range encroachment issues, such as airspace restrictions, designation of critical habitats, unexploded ordnance and munitions, noise, safety, public access, hazardous materials, air quality, and groundwater quality. This framework will lay the foundation for ensuring that near- and long-term T&E and training range availability are sustained to maintain the highest possible level of readiness.

CONTINUING PARTNERSHIP INITIATIVES—  
COOPERATIVE ECOSYSTEM STUDIES UNITS

In June 1999, the heads of participating Federal agencies signed a Memorandum of Understanding establishing the Cooperative Ecosystem Studies Unit (CESU) Network. CESUs provide research, technical assistance, and education to Federal land management,

environmental, and research agencies, and their partners. The CESU Network has several benefits: a broadened scope of scientific services for Federal agencies, increased technical assistance to resource managers, additional scientific resources and opportunities for universities, and increased diversity of research scientists and institutions.

*Protecting Readiness Tomorrow...*

DoD RELEASES CORAL REEF PROTECTION IMPLEMENTATION PLAN

Coral reefs are valuable ecosystems that provide food, jobs, recreation, protection from storms, and billions of dollars in revenue to local communities and national economies. In October 2000, DoD finalized its Coral Reef Protection Implementation Plan outlining policies and actions for implementing the military's responsibilities under E.O. 13089, "Coral Reef Protection." This order directs Federal agencies to study, restore, and conserve U.S. coral reef ecosystems and establishes a U.S. Coral Reef Task Force composed of the Federal departments and agencies charged with overseeing implementation of the order. The Assistant Secretary of the Navy (Installations and Environment) represents DoD on the task force.

DoD's Coral Reef Protection Implementation Plan provides guidance on how the military can minimize the potential for adverse impacts on coral reef ecosystems when conducting operations in areas containing these resources. The guidance includes examples and provides—

- A comprehensive overview of Army, Navy, Marine Corps, and Air Force policies and programs related to coral reef protection
- A description of military activities that potentially affect coral reef ecosystems
- A list of funding sources for coral reef conservation activities
- A description of DoD research, outreach, and stewardship initiatives, planned and in progress, designed to protect and enhance coral reef ecosystems.

This plan demonstrates DoD's commitment to incorporating coral reef protection and conservation into military training and operational activities. Through sound environmental practices, such as resource awareness, careful planning, and avoidance of sensitive ecological areas when possible, DoD can continue its operations while fulfilling its stewardship responsibilities.



*Coral reefs, like this one, are valuable ecosystems that provide food, jobs, protection from storms, and revenue to local communities and national economies.*

Federal land management, environmental, and research agencies, along with the nation's universities, share several science-based goals as they prepare for the 21st century. These include high-quality science, usable knowledge for resource managers, responsive technical assistance, continuing education, and cost-effective research programs. The objectives of the CESU Network are to—

- Provide resource managers with high-quality scientific research, technical assistance, and education
  - Deliver research and technical assistance that is timely, relevant to resource managers, and needed to develop and implement sound adaptive management approaches
  - Ensure the independence and objectivity of research
  - Create and maintain effective partnerships among Federal agencies and universities to share resources and expertise
- Take full advantage of university resources while benefiting faculty and students
  - Encourage professional development of Federal scientists
  - Manage Federal science resources efficiently.

Each CESU is made up of Federal agencies, a host university, and partner institutions. Participating Federal agencies currently include the Bureau of Land Management, the Department of Energy, the National Park Service, the U.S. Bureau of Reclamation, the U.S. Forest Service, and the U.S. Geological Survey. DoD joined the network in September 2000 and now serves as a council member and technical advisor on one of the CESUs. Additional Federal agencies will join the CESU Network in the near future.

Ensuring military readiness is a crucial and challenging issue facing DoD. Many of our installations and training ranges operate in close proximity to Indian lands. Since the beginning of World War II, DoD has conducted operational and training activities throughout the nation and some of these activities have affected Indian lands. Under its Federal Indian trust responsibility, DoD has an obligation to address the environmental effects of its activities on Indian lands—and this is a priority for DoD. Addressing our environmental legacy by building strong, proactive relationships with tribes reflects our determination to fulfill the trust obligations of the Federal government as we work to ensure the nation's security.

#### THE NATIVE AMERICAN LANDS ENVIRONMENTAL MITIGATION PROGRAM

As part of DoD's mission to defend our nation, certain activities—such as weapons testing, practice bombing, and field maneuvers—have affected Indian lands and Alaska Native Claims Settlement Act (ANCSA)-conveyed properties. Evidence of DoD's past practices, including hazardous materials, unexploded ordnance, abandoned buildings, equipment, and debris, still remains on some Indian lands. This contamination has a negative impact on tribal economic, social, and cultural welfare. DoD has a responsibility to address these concerns, but has not been able to do so in a timely manner because many impacts on Indian lands typically rank lower or are not eligible for assistance under DoD's other environmental restoration programs.

## AMERICAN INDIAN AND ALASKA NATIVE INITIATIVES

*Under its Federal trust responsibility, DoD has an obligation to address environmental impacts on Indian lands—and this is a priority for DoD.*



In recognition of DoD’s trust responsibility and the need to address environmental impacts unique to tribes, each year since 1993 Congress has inserted a provision in the DoD Appropriations Act requiring DoD to devote specific funds to mitigate environmental impacts to Indian lands. In order to comprehensively address impacts on Indian lands, DoD used these funds to create the Native American Lands Environmental Mitigation Program (NALEMP). Through NALEMP, DoD is able to identify impacts on Indian lands and work with affected tribes to address them.

For the past several years, DoD has spent \$8 million annually to fund this program. In FY 2000, almost 85 percent of the funding supported mitigation activities, such as field projects, cooperative agreements, technology demonstrations, and site assessments (Figure 32). The remaining funding helped DoD implement the American Indian and Alaska Native Policy, produce cultural sensitivity training, develop a system to maintain site

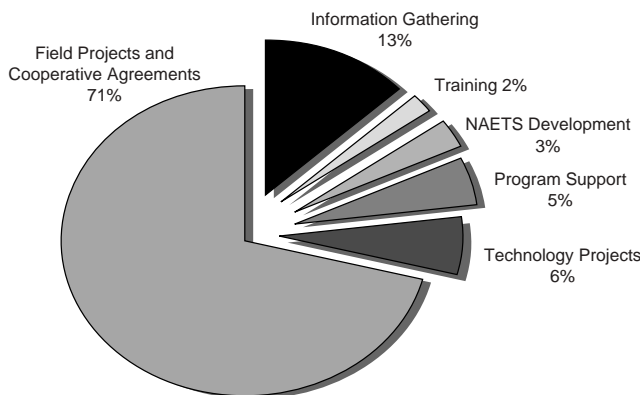
information and track mitigation efforts, and conduct outreach. For FY 2001, Congress increased this funding to \$10 million.

COOPERATIVE AGREEMENTS WITH TRIBES

DoD uses cooperative agreements as its primary tool to work with tribes. These agreements between a tribal government and DoD establish partnerships to mitigate environmental contamination resulting from past DoD activities in a manner that protects human health and the environment. The agreements are DoD’s and the tribal governments’ preferred method for addressing impacts to tribal lands. They give tribes a greater degree of control over the mitigation work on their lands.

Both DoD and the tribes have benefited from using cooperative agreements. For example, a consortium of native villages located in central Alaska, the Tanana Chiefs Conference, and DoD entered into a NALEMP cooperative agreement to conduct field visits and

**Figure 32**  
**FY 2000 NALEMP Funding Allocation**



*Honoring Relationships with American Indians and Alaska Natives*

Central to our efforts to address environmental impacts on Indian lands is DoD’s American Indian and Alaska Native Policy. Developed in close consultation with tribal governments, the policy promotes natural and cultural resource protection. At the heart of the policy is DoD’s commitment to its trust responsibilities and obligation to consult with affected Indian tribes and Alaska Native entities on a government-to-government basis. The policy is the foundation on which DoD builds more effective relationships with American Indians and Alaska Natives.



preliminary site assessments at sites with potential DoD impacts. The agreement provided training for the tribal liaisons on military impacts and regional environmental issues, thereby building the Tanana Chiefs Conference’s technical expertise. The tribal liaisons can now better support the Conference’s review of environmental assessment data, removal action plans, and records of decision. The agreement also enabled tribal leaders to participate in public education and the technical review of environmental documents. The cooperative agreement had the additional benefit of educating DoD staff on regional cultural issues to facilitate future relations.

The cooperative agreement with the Tanana Chiefs Conference has allowed DoD to form productive government-to-government relationships with the member tribes, and has led to cooperative agreements with several member tribes to address their specific impacts from former DoD activities—fulfilling DoD’s trust responsibilities in some of the most remote parts of Alaska.

Cooperative agreements have proven to be a successful way to form and sustain partnerships that lead to efficient cleanup and more effectively respond to DoD’s trust and environmental cleanup responsibilities.

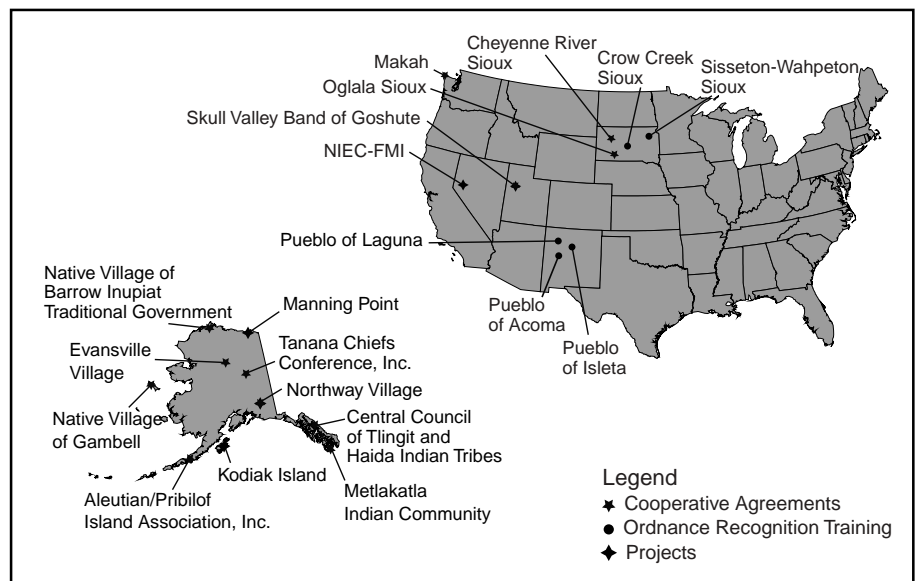
Figure 33 displays the distribution of cooperative agreements, projects, and training efforts.

### ON-LINE TRACKING OF IMPACTS

To assist in fulfilling its Federal trust responsibility and respond to the Congressional mandate, DoD collects information to compile tribal reports on DoD impacts. Through these information gathering activities, DoD identifies and assesses environmental impacts caused by past DoD activities on Indian lands.

DoD developed a Web-based system to maintain the inventoried information and to track ongoing mitigation efforts at these sites. DoD, the tribes, and the public can access and report information in the Native American Environmental Tracking System (NAETS). DoD and the tribes participate in recording the data in NAETS, thereby allowing information

**Figure 33  
Cooperative Agreements and Projects**



to be shared between DoD and the tribal governments. DoD makes NALEMP funding decisions based on the information in NAETS.

NAETS also has a geographic information system component that displays information about tribes, Indian lands, and ANCSA–conveyed properties. The public can view NAETS on the Internet at:

*<https://www.denix.osd.mil/denix/Public/Native/Mitigation/naets.html>*

### LEARNING ABOUT TRIBAL CULTURES

Open and effective communication and consultation is critical to working with tribal governments. Understanding our cultural differences is a key component to facilitating an open dialogue and working together toward mutually satisfactory solutions. To address the need for cultural sensitivity training, DoD developed the American Indian and Alaska Native Cultural Communications course for its personnel. The purpose of the training is to teach cultural sensitivity and awareness, and provide the skills necessary to work and consult effectively with tribes. DoD conducted training sessions at the White Sands Missile Range, New Mexico; Fort Bliss, Texas; and Fort Lewis, Washington, during FY 2000. Additional training classes are scheduled for FY 2001.

### REACHING OUT TO THE TRIBES

In the American Indian and Alaska Native Policy, DoD committed to establishing a Senior-level Tribal Liaison in the Office of the Secretary of Defense. The Senior Tribal Liaison facilitates communication and consultation between DoD and tribes and responds to tribal requests for action and information related to DoD activities. The Secretary of Defense appointed the Office of the Deputy Under Secretary of Defense (Installations and Environment) as the Senior Tribal Liaison. The Office led the policy development effort and has been serving as Tribal Liaison, facilitating the resolution of several controversial issues related to DoD activities and operations. This designation responds to the wishes of Federally-recognized tribes that there be a focal point within DoD for working on a government-to-government basis with them.

### FUTURE EFFORTS

The Congressional funding provided for NALEMP has given DoD much more flexibility to address the unique concerns of tribes and to address some sites on Indian lands sooner. Additionally, this funding helps DoD develop stronger relationships with tribes and meet DoD's share of the trust obligations owed to Federally recognized tribes.

## BACKGROUND AND BENEFITS

### ■ **Promoting Military Professionalism**

Defense environmental cooperation supports the U.S. National Security Strategy, National Military Strategy, and U.S. foreign and defense policy goals. Through military-to-military cooperation, DoD seeks to foster democratization, regional stability, strong alliances, and competent coalition partners. Defense environmental cooperation activities also provide DoD with the opportunity to demonstrate concepts critical to a professional military—civilian oversight, openness, transparency, public accountability, and cooperation with civilian agencies.

### ■ **Promoting Regional Stability**

Within an interagency framework, defense environmental cooperation activities promote regional stability by encouraging militaries to discuss regional environmental issues. Discussions about environmental issues provide a non-threatening forum for building trust among militaries within a region.

### ■ **Maintaining Access**

Defense environmental cooperation exchanges demonstrate DoD's strong commitment to environmental stewardship, thereby enhancing our image as a trusted ally and a responsible force. These exchanges also demonstrate that DoD is well prepared and committed to protecting the environmental resources

## DEFENSE ENVIRONMENTAL COOPERATION

*International partnering efforts worldwide contribute to interoperability; maintenance of access to air, land, and sea resources necessary for training and readiness; and fostering of a global military environmental ethic.*



entrusted to us by host nations. These efforts provide help in attaining and maintaining international access to air, land, and sea resources necessary for training and operations.

- **Sharing Technology**

DoD's environmental cooperation program activities provide opportunities for U.S. government agencies and industry to better understand the needs of foreign militaries and allow access to foreign environmental research data, technologies, and processes. Examples of these opportunities are studies on minimization of aircraft noise, access to research data on the potential effects of depleted uranium, and TNT demilitarization processes.

## RAISING STANDARDS BY WORKING TOGETHER

DoD's environment, safety, and occupational health (ESOH) program has become an effective tool for raising the standards and institutional capacity of our allies—old and new—to meet health force protection needs. These efforts support the development of competent coalition partners who are better able to operate with our forces in multinational scenarios, with an enhanced understanding of ESOH issues affecting their troops, our troops, the local population, and the environment. Cooperation on common ESOH issues with other militaries allows us access to health-related environmental data. This information leads to strategic preventive medicine and health

knowledge that will keep our forces mission-ready and capable.

Of great interest to the global community is a common concern for the environment—the protection and conservation of scarce natural resources. This growing worldwide concern is demonstrated by citizens' demands upon their own government's behavior and practices. The militaries are often a prime target for concerned environmental groups. In response to this movement, defense organizations from foreign nations are requesting environmental cooperation exchanges as an important aspect of their bilateral and multilateral agreements with DoD.

Our current environmental cooperation stresses a regional approach, leveraging relatively low-cost activities traditionally conducted under this program. Examples of cooperation activities include—

- Delegation exchanges
- Joint analysis of environmental data
- Information sharing
- Bilateral or multilateral development of ESOH products, such as handbooks, which are generic in nature and can be utilized in promoting ESOH concepts in militaries worldwide
- Hosting or attending conferences that address military ESOH issues in a regional or multilateral context.

## FY 2000 HIGHLIGHTS

**Southeastern Europe Defense Ministerial (SEDM):** With DoD's support, the Slovenian Ministry of Defense hosted an international workshop on military ESOH management. Representatives from more than 15 nations attended and discussed various concerns and implications of effective ESOH programs in the military. SEDM is comprised mainly of former Yugoslav republics, and this forum provided an important venue for regional stabilization among the Balkan nations.

**European Union (EU):** With the cooperation and sponsorship of the Deputy Director General, Environment, of the European Commission, the United States initiated an alliance of European defense ministries. The goal of this new alliance is to raise the level of understanding and awareness among defense agencies of the EU's legislative process and the potential impact of regulations and directives on the EU (and the United States) in their ability to carry out national and coalition defense missions in Europe. Several meetings and workshops are planned for FY 2001.

**Republic of South Africa:** The Environmental Security Working Group, which comprises a portion of the overall United States – Republic of South Africa Defense Committee program, continued its aggressive program by publishing three handbooks that can be employed worldwide in engagement activities with other nations. The handbooks cover environmental Web site design, base conversion, and environmental management of training lands.

**Philippines:** On July 27, 2000, the United States signed a joint statement with the Philippine government concerning future cooperation on a broad range of environmental and public health matters. Soon thereafter, DoD initiated an information exchange on a variety of defense-related environmental issues with the goal of building environmental capacity within the Philippines. In addressing these issues, DoD is working with interagency partners, including EPA and the Department of Energy.

**Australia and Canada:** The United States continued to advance its trilateral environmental relationship with Australia and Canada. Such contacts permit the exchange of valuable environmental and interoperability information. In addition, the relationship has increased United States' access to Australian training areas.

**Argentina and Chile:** The United States – Argentina Bilateral Working Group and the United States – Chile Defense Consultative Commission were created in 1998 and 1999, respectively. By chairing the Defense Environmental Issues Working Group, the Office of the Deputy Under Secretary of Defense (Installations and Environment) supports this robust effort, which is led by the Office of the Under Secretary of Defense (Policy). Events this year focus on range management, pollution prevention, and budget preparation and strategies.

**Arabian Gulf States:** The Gulf Cooperation Council (GCC) held the first forum of its kind

to identify, examine, and provide an opportunity for collaboration on environmental challenges in the GCC states and adjacent waters. The Office of the Deputy Under Secretary of Defense (Installations and Environment) co-hosted, with the U.S. Central Command (USCENTCOM), this important regional event in support of USCENTCOM's Theater Engagement Plan. Critical to these discussions was the unique role of the Armed Services, aimed at resolving issues, such as fresh water scarcity and contamination, fisheries, hazardous waste and disposal, management of natural resources, and control of environmental disasters.

**SUMMARY**

DoD's international environmental cooperation activities support U.S. and DoD policy objectives and provide a tool for shaping the international environment in a non-threatening, low cost, highly effective approach. DoD is responding to the stated desires and needs of foreign militaries who recognize the importance of environmental stewardship in conducting their activities. DoD helps build trust,

openness, and a global environmental ethic through this international cooperation program.

**FUNDING**

During FY 2000, DoD invested \$1.83 million for travel, information exchanges, conference support, guidebooks, and studies as part of the international defense environmental cooperation program. The regional Unified Commands, as well as the Military Services, the Office of the Deputy Under Secretary of Defense (Installations and Environment), and other defense agencies expended these and other funds to support this program. Additional funding sources include defense-wide and Service operation and maintenance funds, Warsaw Initiative Funds, Traditional Commander-in-Chief Activities Funds, and Office of the Secretary of Defense Studies Funds. These organizations plan to invest \$3.4 million in FY 2002 (Figures 34 and 35) for similar activities. Of this amount, \$1.9 million will come from the Defense Environmental Cooperation request in the President's FY 2002 budget.

**Figure 34**  
**Summary of International Travel, Pilot Studies, and Conferences**  
 (Current \$000)

Type of Expenditure	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate	FY 2002 Budget
Conferences/Meetings	\$1,017	\$1,045	\$1,080	\$2,247
Pilot Studies	\$454	\$480	\$910	\$862
Travel	\$188	\$305	\$320	\$301
<b>DoD Total</b>	<b>\$1,659</b>	<b>\$1,830</b>	<b>\$2,310</b>	<b>\$3,410</b>

**Figure 35**  
**International Travel, Pilot Studies, and Conferences**  
**International Environmental Cooperation (Current \$000)**

Component	Type of Expenditure	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate	FY 2002 Budget
Ballistic Missile Defense Organization <sup>†</sup>	Conferences/Meetings	—	\$0	\$1	\$1
	Pilot Studies	—	\$0	\$0	\$0
	Travel*	—	\$0	\$7	\$7
	subtotal		\$0	\$8	\$8
Defense Environmental Security Corporate Information Management Program**	Conferences/Meetings	\$0	—	—	—
	Pilot Studies	\$0	—	—	—
	Travel	\$14	—	—	—
	subtotal	\$14			
Defense Health Program	Conferences/Meetings	\$0	—	—	—
	Pilot Studies	\$0	—	—	—
	Travel	\$8	—	—	—
	subtotal	\$8			
Defense Logistics Agency <sup>†</sup>	Conferences/Meetings	—	\$5	\$4	\$3
	Pilot Studies	—	\$75	\$0	\$480
	Travel	—	\$98	\$85	\$80
	subtotal		\$178	\$89	\$563
National Security Agency	Conferences/Meetings	\$6	—	—	—
	Pilot Studies	\$0	—	—	—
	Travel	\$2	—	—	—
	subtotal	\$8			
Office of the Deputy Under Secretary of Defense (Installations and Environment)	Conferences/Meetings	\$867	\$515	\$461	\$1,643
	Pilot Studies	\$204	\$180	\$514	\$280
	Travel	\$85	\$82	\$90	\$88
	subtotal	\$1,156	\$777	\$1,065	\$2,011
U.S. Air Force	Conferences/Meetings	\$51	\$205	\$44	\$0
	Pilot Studies	\$250	\$76	\$353	\$0
	Travel	\$20	\$49	\$12	\$0
	subtotal	\$321	\$330	\$409	\$0
U.S. Army <sup>†</sup>	Conferences/Meetings	—	\$0	\$0	\$0
	Pilot Studies	—	\$149	\$43	\$102
	Travel	—	\$10	\$7	\$6
	subtotal		\$159	\$50	\$108
U.S. European Command	Conferences/Meetings	\$71	\$270	\$270	\$300
	Pilot Studies	\$0	\$0	\$0	\$0
	Travel	\$0	\$5	\$5	\$5
	subtotal	\$71	\$275	\$275	\$305
U.S. Joint Forces Command	Conferences/Meetings	\$0	\$0	\$0	\$0
	Pilot Studies	\$0	\$0	\$0	\$0
	Travel	\$9	\$3	\$8	\$9
	subtotal	\$9	\$3	\$8	\$9
U.S. Navy	Conferences/Meetings	\$2	\$0	\$0	\$0
	Pilot Studies	\$0	\$0	\$0	\$0
	Travel	\$50	\$58	\$56	\$56
	subtotal	\$52	\$58	\$56	\$56
U.S. Southern Command	Conferences/Meetings	\$20	\$50	\$300	\$300
	Pilot Studies	\$0	\$0	\$0	\$0
	Travel	\$0	\$0	\$50	\$50
	subtotal	\$20	\$50	\$350	\$350
<b>DoD Total</b>		<b>\$1,659</b>	<b>\$1,830</b>	<b>\$2,310</b>	<b>\$3,410</b>

\* All travel is related to conferences, meetings, and pilot studies.

\*\* DESCIM is being absorbed into the U.S. Army.

<sup>†</sup> This organization did not identify any requirements for FY 1999.

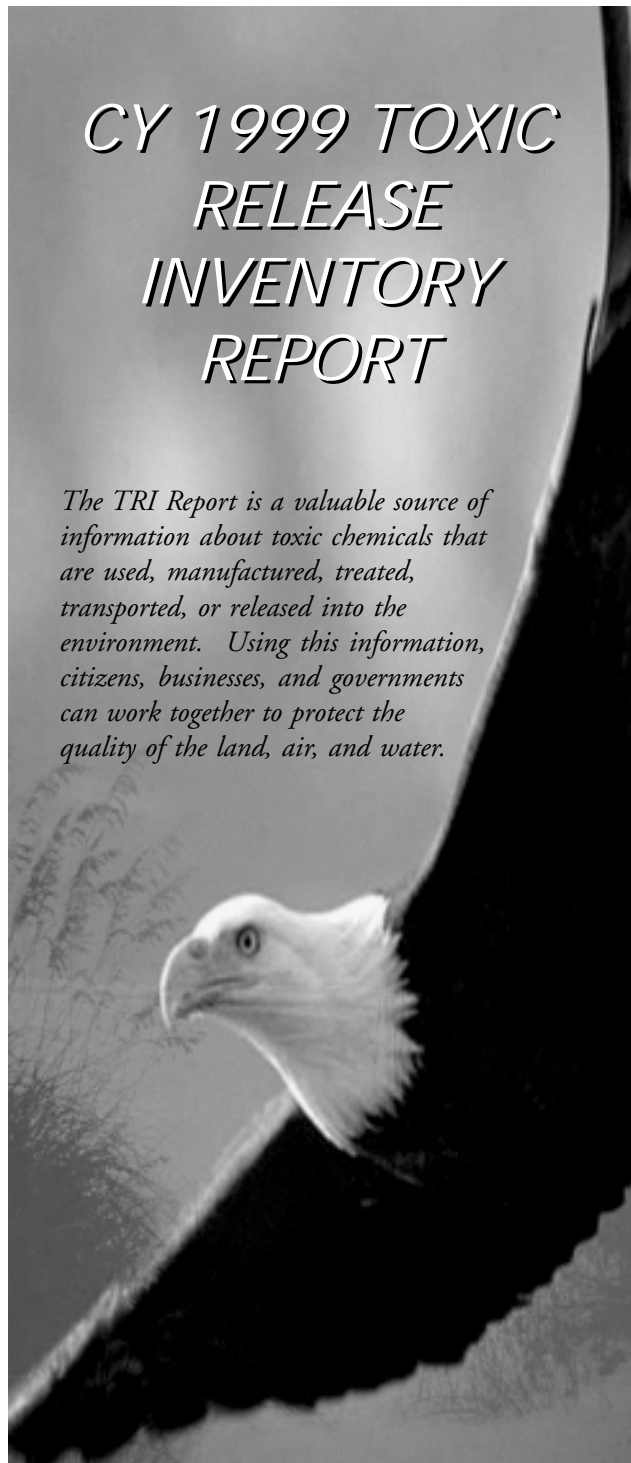
The Toxic Release Inventory (TRI) Report<sup>3</sup> is a valuable source of information about toxic chemicals that are used, manufactured, treated, transported, or released into the environment. The Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and the Pollution Prevention Act of 1990 mandated that EPA develop and maintain a publicly accessible toxic chemical database. This database, known as the TRI, contains information concerning waste management activities and the release of toxic chemicals by facilities that manufacture, process, or otherwise use these materials. Using this information, citizens, businesses, and governments can work together to protect the quality of their land, air, and water.

TRI facilities are required to report releases of toxic chemicals into the air, water, and land. In addition, they must report off-site transfers of wastes for treatment or disposal at a separate facility. Facilities are also required to report on pollution prevention activities and chemical recycling. Facilities must submit reports on or before July 1 each year, covering activities that occurred during the previous calendar year.

When EPA developed the TRI database, it included an original list of 300 reportable chemicals. To be included on this list, a chemical's toxicity must be found to cause serious chronic or acute human health risks, such as cancer, reproductive dysfunction, or neurological disorders, and/or adverse environmental effects. Not only can EPA add to the list of reportable chemicals, but it can

## CY 1999 TOXIC RELEASE INVENTORY REPORT

*The TRI Report is a valuable source of information about toxic chemicals that are used, manufactured, treated, transported, or released into the environment. Using this information, citizens, businesses, and governments can work together to protect the quality of the land, air, and water.*



<sup>3</sup> Although the reporting period for this Annual Report to Congress covers FY 2000 (October 1, 1999 through September 30, 2000), the TRI reporting period covers CY 1999 (January 1 through December 31, 1999).



also remove, or delist, chemicals, as it did with phosphoric acid in CY 1999. Chemicals are added and delisted through either EPA-initiated action or an independent petition process.

EPA's TRI reporting program is constantly evolving through the addition of chemicals, chemical categories, newly regulated facilities, and new data elements. In addition to these changes, EPA allows TRI reporting facilities to submit revisions to prior years' reports if the data are found to be deficient in a later review. Facilities may initially submit estimates of their releases and off-site transfers. However, after the reporting deadline has passed, facilities may become aware that they misreported. Enabling facilities to revise historical data encourages review of original data submissions and recalculation of reportable TRI figures.

### ORIGINAL BASELINE GOALS AND ACCOMPLISHMENTS

In response to the fact that Federal agencies are not regulated under EPCRA, in 1993, President Clinton issued E.O. 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements," which required Federal facilities to comply with TRI reporting requirements. In addition, the E.O. required Federal facilities to reduce TRI releases and off-site transfers by 50 percent from the baseline year of 1994. By 1996, DoD had achieved this objective—3 years ahead of the President's goal of 1999.

Going beyond the achievement of meeting TRI reduction goals early, many facilities continued to reduce releases and off-site transfers below reporting thresholds, and no longer are required to report. In addition, some facilities have closed and no longer report (Figure 36). In 1994, 118 DoD facilities reported TRI releases or off-site transfers. By 1999, only 63 facilities reported.

**Figure 36  
Specific Facilities Closed  
1994 to 1999**

<b>ARMY</b>	<i>Kansas City Ammunition Plant, Kansas</i>	<b>DLA</b>	<i>Defense Depot Ogden, Utah</i>
	<i>Longhorn Ammunition Plant, Texas (layaway status)</i>		<i>William Langer Jewel Bearing Plant, North Dakota</i>
<b>NAVY</b>	<i>Stratford Army Engine Plant, Connecticut</i>	<b>AIR FORCE</b>	<i>None</i>
	<i>Sunflower Army Ammunition Plant, Kansas</i>		
	<i>Naval Air Station, Alameda, California</i>		
	<i>Naval Shipyard, Long Beach, California</i>		
	<i>Naval Shipyard, Philadelphia, Pennsylvania</i>		
	<i>Naval Air Warfare Center, Trenton, New Jersey</i>		
	<i>Hercules' Corporation, McGregor, Texas (GOCO*)</i>		
	<i>Northrop Grumman Calverton, Maryland (GOCO*)</i>		
	<i>Northrop Grumman Bethpage, Maryland (GOCO*)</i>		

\*GOCO = Government-Owned, Contractor-Operated Facility

## CHANGES TO REPORTING REQUIREMENTS SINCE 1994

Since DoD began reporting TRI releases and off-site transfers in 1994, EPA has made several changes to the reporting requirements that have significantly affected the measurement of DoD's progress against the 1994 baseline.<sup>4</sup> In 1995, EPA added 300 chemicals to the list of TRI reportable chemicals, which doubled the list from 300 to 600. (There are currently almost 650 chemicals on the TRI reporting list.) This was a significant modification that had a noteworthy impact on DoD's reporting, particularly because the additional chemicals included nitrate compounds. Treating wastewater from munitions manufacturing generates large amounts of nitrate compounds. Reducing the creation of these nitrate compounds is difficult due to manufacturing process requirements and the lack of effective, alternative methods for wastewater treatment.

The additional chemicals are separate from the original 50 percent reduction goal established in E.O. 12856. Therefore, the 50 percent goal that DoD reached in 1996 was measured against the original list of 300 chemicals.<sup>5</sup>

<sup>4</sup> All of EPA's changes to TRI reporting requirements affect all TRI reporters nationwide, not just DoD.

<sup>5</sup> In 1995, EPA removed all non-aerosol forms of hydrochloric acid (HCl) from the TRI list of reportable chemicals. However, the aerosol forms of HCl remain reportable and thus appear on the 1999 Top 10 Chemical Snapshot lists.

### WHO REPORTS?

*Only those facilities that manufacture or process listed toxic chemicals in excess of 25,000 pounds within one calendar year, or otherwise use listed toxic chemicals in excess of 10,000 pounds within one calendar year, are required to submit TRI Reports to EPA and the states by July 1 of each calendar year.*

### ADDITION OF MUNITIONS DEMILITARIZATION REPORTING REQUIREMENTS

The U.S. Armed Forces continue to have a large stockpile of excess munitions. The current inventory is estimated at 400,000 tons and is growing at a rate of 40,000 tons per year. Many of the materials in the stockpile are old, unstable, and unsafe. The most common disposal method in use today is open burning/open detonation (OB/OD), which is a relatively simple and cost effective means for reducing the stockpile.

OB/OD operations are conducted to destroy excess, obsolete, or unserviceable munitions. In OB operations, munitions are destroyed by a self-sustained combustion, which is ignited by an external source, such as flame or heat. In OD operations, explosives and munitions are destroyed through a controlled series of detonations. Both methods generate releases to the environment.

Although reporting data from demilitarization activities, such as OB/OD, is not a new requirement, DoD deferred reporting this data until the proper measurement tools were

available. Therefore, DoD did not include releases and off-site transfers from these activities in the 1994 baseline. Installations included demilitarization activities for the first time in their data submittals for this report.

While each Military Service conducts demilitarization activities and reports releases and off-site transfers from these activities, the Army is the largest producer of demilitarization-related releases and off-site transfers because it manages most of the munitions for all of the Military Services. Demilitarization activities are dependent on mission requirements, so the level of demilitarization activity fluctuates with activity levels. For this first demilitarization reporting year, 6 Army installations reported releases and off-site transfers as a result of OB/OD (Sierra Army Depot, California; McAlester Army Ammunition Plant, Oklahoma; Anniston Army Depot, Alabama; Red River Army Depot, Texas; Letterkenny Army Depot, Pennsylvania; and Lone Star Army Ammunition Plant, Texas). Sierra Army Depot was the largest single contributor to the Army's and DoD's TRI total, at over 5.4 million pounds.

## DoD's CY 1999 TRI REPORT

DoD's compliance with TRI reporting requirements is important for many reasons, most of all because it protects our people. By reducing releases and off-site transfers of toxic chemicals, we reduce our impact on the

environment, which is beneficial not only to our service members and their families, but also for those living near our facilities.

In 1999, we achieved a 77 percent reduction of DoD's toxic chemical releases and off-site transfers from the original 1994 baseline (Figure 37). DoD's reductions in TRI releases and off-site transfers since 1994 are due to three primary factors—

- An emphasis on pollution prevention
- Production changes and base closures
- Improved reporting and more accurate accounting for material.

Since 1996, DoD's large maintenance and depot operations, primarily those engaged in overhauling and repairing aircraft, ships, and tanks, and munitions manufacturing and demilitarization, have reported the largest volumes of DoD releases and off-site transfers.

As mentioned previously, new reporting requirements became effective in 1999, which mandate TRI reporting from additional activities, including demilitarization. Due to these new reporting requirements, DoD reported releases and off-site transfers of more than 9.7 million tons, an increase of almost 250 percent from the previous reporting year. Even with such a dramatic increase in total releases and off-site transfers, DoD continued to reduce TRI releases and off-site transfers, as evidenced by the fact that DoD achieved a 10 percent reduction in 1999, from the 1994 baseline, after factoring in newly reportable chemicals and activities (Figure 38).

Figure 37 highlights DoD's achievements in reducing toxic chemical releases and off-site transfers since 1994, measured against the 1994 TRI baseline. This figure shows the reductions from the original reporting guidelines, assuming that no changes to the reporting requirements or additions of reportable chemicals and compounds occurred. Figure 38 also illustrates DoD's total reductions in toxic chemical releases and off-site transfers measured against the 1994 TRI baseline. However, these measurements take into account changes in

reporting requirements since 1994, such as yearly reporting amendments (including reporting from demilitarization activities beginning in 1999) and changes to the chemical and chemical compound list. The left column in both figures lists the 7 categories to which toxic chemicals are released (the figures do not include categories for off-site transfers). These release categories have the potential for the greatest impact and are, therefore, the categories that DoD is most concerned with reducing.

**Figure 37**  
**DoD TRI Reportable Quantities, 1994 to 1999**  
assuming no changes to reporting requirements  
(pounds released or transferred)

Category	1994	1995	1996	1997	1998	1999	1994 - 1999 % Change
On-Site to Water	90,629	359,994	334,137	1,130,764	824,535	65,419	-27.82%
OnSite to Air	6,986,203	4,990,877	3,452,010	2,806,889	2,129,652	1,616,822	-76.86%
On-Site to Underground Injection	390	0	0	0	0	0	-100.00%
On-Site to Land	113,714	28,945	32,164	101,335	11,800	2,475	-97.82%
Off-Site to POTW	95,987	11,104	56,219	78,530	90,689	4,709	-95.09%
Off-Site Treatment	1,395,277	804,331	554,821	462,661	334,812	271,836	-80.52%
Off-Site Disposal	2,106,736	670,105	518,953	301,767	406,165	474,498	-77.48%
CALCULATED BASELINE							-77.42%

**Figure 38**  
**DoD TRI Reportable Quantities, 1994 to 1999**  
assuming changes to reporting requirements  
(pounds released or transferred)

Category	1994	1995	1996	1997	1998	1999	1994 - 1999 % Change
On-Site to Water	90,629	359,994	393,844	191,106	904,140	817,059	801.54%
OnSite to Air	6,986,203	4,990,877	3,452,010	2,806,889	2,129,652	7,207,402	3.17%
On-Site to Underground Injection	390	0	0	0	0	0	-100.00%
On-Site to Land	113,714	28,945	32,164	101,335	11,800	718,089	531.49%
Off-Site to POTW	95,987	11,104	56,219	78,530	90,689	234,108	143.90%
Off-Site Treatment	1,395,277	804,331	554,821	462,661	418,665	274,505	-80.33%
Off-Site Disposal	2,106,736	670,105	518,953	301,767	406,165	476,059	-77.40%
CALCULATED BASELINE							-9.84%

## DoD's ROLE IN EPA'S CY 1999 TRI REPORT

DoD's facilities are only a small percentage of those that reported to EPA's *1999 Toxic Release Inventory Public Data Release*. Overall, 22,639 facilities reported toxic releases and off-site transfers to EPA; 63 of those were DoD facilities. EPA reported a total of more than 7.77 billion pounds of toxic chemicals released or transferred off-site during CY 1999; DoD contributed 9.7 million pounds, or 0.125 percent of the total. According to EPA's report, each facility released or transferred off-site an average of 343,303 pounds of toxic chemicals; DoD's average per facility was 154,400 pounds. (Figure 39 contains a summary of DoD's contributions to EPA's total TRI report.) Our past performance makes clear our commitment to meeting the TRI reduction goals and challenges EPA and past executive orders have laid out, and encourages us to continue meeting and exceeding these goals and challenges.

**Figure 39**  
**Comparison of CY 1999 TRI Reports:**  
**DoD and EPA Totals**

	DoD	EPA*
Number of Facilities Reporting	63	> 22,600
Total Releases and Transfers	10 million pounds**	> 7.77 billion pounds
Average Releases and Transfers per Facility	154,400 pounds***	343,303 pounds
Percent Change from CY 1998 Report	-10%	+5%

\* EPA's report encompasses all TRI reporters, including DoD.

\*\* This represents 0.125 percent of the total.

\*\*\* DoD's average is 45 percent of EPA's average.

## FUTURE DIRECTIONS

### NEW REDUCTION GOALS IN E.O. 13148

In April 2000, E.O. 13148, "Greening the Government through Leadership in Environmental Management," replaced E.O. 12856. This new E.O. continues the mandate that Federal facilities conduct TRI reporting and established new TRI reduction goals. E.O. 13148 requires Federal facilities to reduce TRI releases and off-site transfers by 40 percent (using a CY 2001 baseline year) by December 31, 2006. DoD is already well on its way to meeting the goals established in E.O. 13148 since many of the goals were part of DoD policy prior to the order.

### THRESHOLD FOR LEAD REPORTING

An additional change in TRI reporting requirements that EPA enacted in 2000 is the reduction of the reporting threshold for lead from 10,000 pounds to 100 pounds. Because DoD relies heavily on lead for use in munitions, changes in the TRI reporting requirement will substantially impact the levels of lead reported. However, this new requirement does not take effect until the publication of the FY 2002 Environmental Quality Annual Report to Congress. (The report, which will be published in 2003, will cover Environmental Quality activities during FY 2002; the TRI report will cover activity that occurred in CY 2001.)

## REPORTING FOR MUNITIONS-RELATED ACTIVITIES

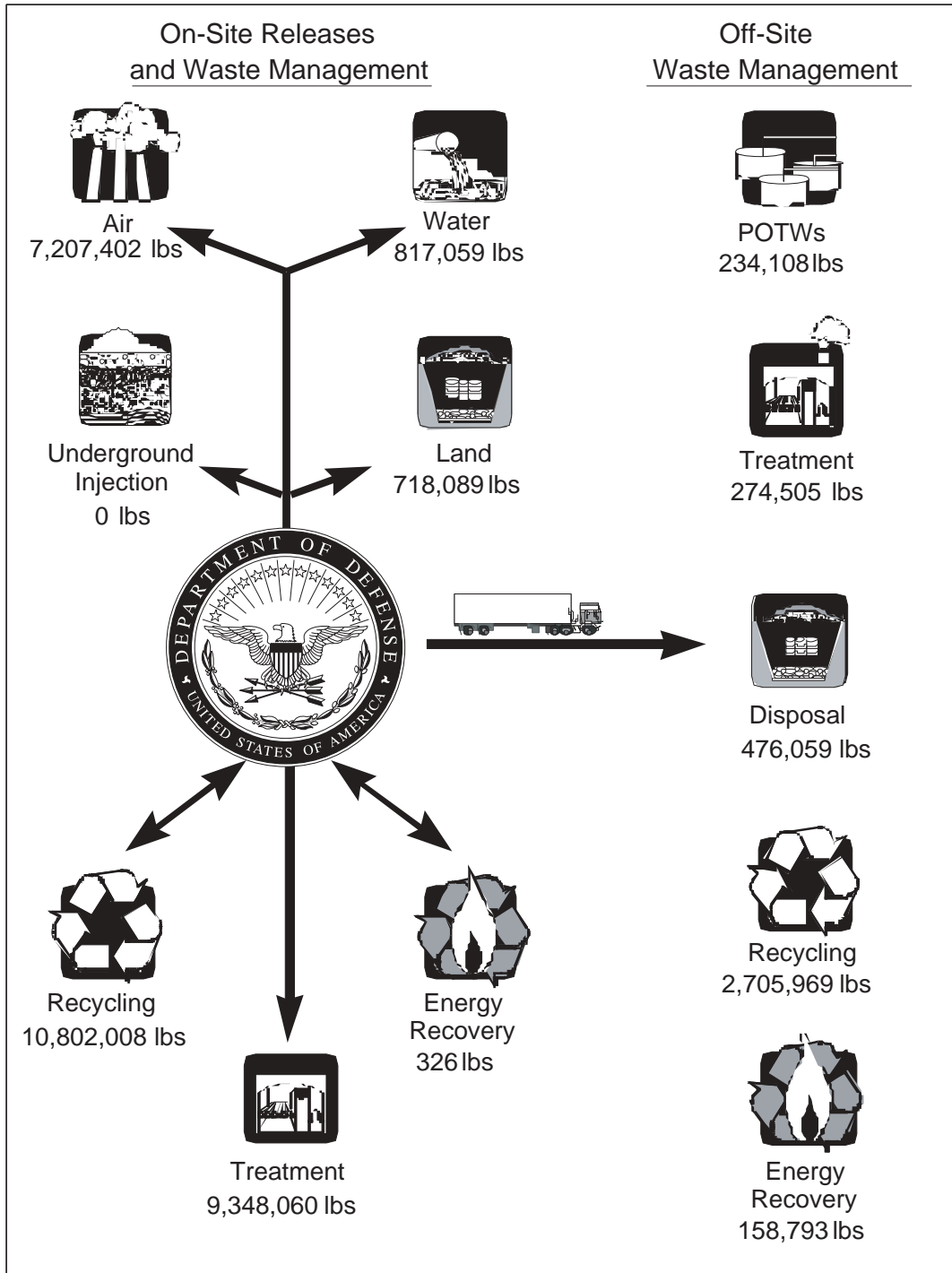
There are three major phases in the life-cycle of munitions—manufacture, use (including range activities), and demilitarization. Facilities involved in manufacturing (required to report since 1994) and demilitarization (required to report starting in 1999) are DoD's biggest TRI reporters. Beginning with CY 2001, DoD will begin reporting releases and off-site transfers associated with range activities. This will result in additional facilities reporting TRI releases and off-site transfers.

Although DoD has reduced the use of some toxic chemicals in munitions manufacturing, reducing TRI releases and off-site transfers from range operations could adversely affect training and mission readiness. In addition, DoD cannot significantly reduce TRI releases and off-site transfers as a result of OB/OD because this process is necessary in the life-cycle of munitions and is required to maintain current and future mission readiness.

DoD recognizes the limited pollution prevention opportunities for munitions-related activities, especially range and demilitarization activities. As a result, DoD is dedicated to finding new ways to reduce TRI releases and off-site transfers from actions other than demilitarization. By focusing reduction efforts elsewhere, DoD can achieve continued TRI reductions without impacting mission readiness. Each DoD Component is working to reduce other releases and off-site transfers to stay on course to achieve reduction goals. DoD will also continue its efforts to identify and reduce the use of toxic chemicals in munitions through the acquisition process. That DoD can succeed at this is evidenced by the reductions in total TRI releases and off-site transfers achieved in CY 1999 despite the additional reporting requirements.

As the TRI reporting system evolves, DoD must evolve and adapt with it. To do so, DoD looks for new ways to improve pollution prevention initiatives and manufacturing techniques.

**Figure 40**  
**CY 1999 TRI Data**



## TOTAL DoD TRI DATA

Table 1  
**Change in Top 10 DoD Chemical Releases and Transfers in Pounds  
 (based on 1994 baseline)**

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
DICHLOROMETHANE	2,235,670	1,617,221	967,859	761,088	671,307	455,910	-80%
METHYL ETHYL KETONE	1,504,895	1,097,024	936,920	622,787	621,515	439,656	-71%
1,1,1-TRICHLOROETHANE	1,232,070	751,890	283,334	217,171	34,335	10	-100%
ETHYLENE GLYCOL	537,125	329,919	316,590	158,462	190,220	119,272	-78%
TOLUENE	445,350	234,517	194,972	126,245	103,489	120,103	-73%
PHENOL	411,988	266,784	124,235	87,281	76,791	52,144	-87%
ZINC COMPOUNDS	409,180	52,738	34,171	28,526	63,395	174,982	57%
TETRACHLOROETHYLENE	359,039	217,682	242,049	195,572	69,838	70,815	-80%
HEXACHLOROETHANE	351,370	56,112	23,461	-	-	-	-100%
HYDROCHLORIC ACID	298,000	Delisted	Delisted	Delisted	Delisted	Delisted	
<b>TOTAL</b>	<b>7,784,687</b>	<b>4,623,887</b>	<b>3,123,591</b>	<b>2,197,132</b>	<b>1,830,890</b>	<b>1,301,253</b>	<b>-83%</b>

Table 2  
**Change in Top 10 DoD Installations Releases and Transfers in Pounds  
 (based on 1994 baseline)**

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
TINKER AFB	1,569,614	1,080,881	728,670	520,020	325,423	304,656	-81%
ROBINS AFB	776,616	578,562	334,898	403,058	368,442	322,549	-58%
ARMY PINE BLUFF ARSENAL	725,534	253,949	47,011	-	-	1,900	-100%
AF PLANT 06	554,555	507,909	292,613	133,400	71,924	41,200	-93%
ANNISTON ARMY DEPOT	527,591	428,840	225,446	245,617	366,481	441,942	-16%
NORTHROP GRUMMAN CORP	462,481	496,710	249,900	256,800	134,170	187,083	-60%
HILL AFB (Ogden)	367,909	263,560	294,815	234,029	250,301	251,551	-32%
KELLY AFB	342,871	227,663	144,014	100,850	42,500	64,010	-81%
MCCLELLAN AFB	340,750	231,800	279,100	162,161	64,100	20,700	-94%
NAS JACKSONVILLE	325,648	247,896	217,041	77,000	88,676	71,415	-78%
<b>TOTAL</b>	<b>5,993,569</b>	<b>4,317,770</b>	<b>2,813,508</b>	<b>2,132,935</b>	<b>1,712,017</b>	<b>1,707,006</b>	<b>-72%</b>

Table 3  
**Top 10 1999 DoD Chemicals  
 (pounds released)**

ALUMINUM (FUME OR DUST)	4,301,338
COPPER	1,214,749
NITRATE COMPOUNDS	1,179,262
DICHLOROMETHANE	455,910
METHYL ETHYL KETONE	439,656
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	238,900
ZINC COMPOUNDS	147,123
XYLENE (MIXED ISOMERS)	131,513
TOLUENE	120,103
N-BUTYL ALCOHOL	120,067

Table 4  
**Top 10 1999 DoD Installations  
 (pounds released)**

SIERRA ARMY DEPOT	5,390,239
RADFORD ARMY AMMUNITION PLANT	703,440
ANNISTON ARMY DEPOT	441,942
ROBINS AFB	322,549
TINKER AFB	304,656
OGDEN AIR LOGISTICS CENTER	251,551
PUGET SOUND NAVAL SHIPYARD	189,148
NORTHROP GRUMMAN CORP	187,083
SCHOFIELD BARRACKS	175,227
HOLSTON ARMY AMMUNITION PLANT	147,850



## ARMY TRI DATA

Table 1  
Change in Top 10 Army Chemical Releases and Transfers in Pounds  
(based on 1994 baseline)

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
ZINC COMPOUNDS	368,971	20,008	31,171	3,426	32,998	147,123	-60%
HEXACHLOROETHANE	351,370	56,112	23,461	-	-	-	-100%
METHYL ETHYL KETONE	230,817	152,486	103,353	65,994	85,359	98,728	-57%
1,1,1-TRICHLOROETHANE	226,377	137,450	86,833	40,719	22,335	-	-100%
TRICHLOROETHYLENE	214,223	148,508	40,000	71,028	34,253	55,881	-74%
DICHLOROMETHANE	186,409	150,300	86,990	115,002	162,155	100,908	-46%
PHOSPHORIC ACID	135,990	48,410	51,177	44,783	94,434	-	-100%
ETHYLENE GLYCOL	121,059	194,648	85,073	35,039	20,366	18,794	-84%
CHLORINE	67,470	11,345	5,418	16,838	21,713	2,154	-97%
CHROMIUM COMPOUNDS	67,413	48,996	61,499	48,159	31,738	38,819	-42%

Table 2  
Change in Top 10 Army Installation Releases and Transfers in Pounds  
(based on 1994 baseline)

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
ARMY PINE BLUFF ARSENAL	725,534	253,949	47,011	-	-	1,900	-100%
ANNISTON ARMY DEPOT	527,591	428,840	225,446	245,617	366,481	441,942	-16%
LETTERKENNY ARMY DEPOT	144,485	109,693	39,621	18,968	27,804	27,852	-81%
ARMY WATERVLIET ARSENAL	135,075	46,144	82,375	96,543	91,282	54,010	-60%
RED RIVER ARMY DEPOT	117,864	81,798	45,778	46,525	19,092	102,543	-13%
HOLSTON ARMY AMMUNITION PLANT	101,900	322,200	236,260	246,100	55,056	147,850	45%
LAKE CITY ARMY AMMUNITION PLANT	83,911	67,497	49,041	42,662	68,012	31,574	-62%
FORT HOOD	57,550	45,600	686	686	61	686	-99%
STRATFORD ENGINEERING PLANT	55,441	24,501	23,701	-	-	-	-100%
ROCK ISLAND ARSENAL	52,000	14,500	-	-	-	-	-100%

Table 3  
Top 10 1999 Army Chemicals  
(pounds released)

ALUMINUM (FUME OR DUST)	4,301,338
COPPER	1,174,061
NITRATE COMPOUNDS	853,797
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	148,900
DICHLOROMETHANE	100,908
METHYL ETHYL KETONE	98,728
LEAD COMPOUNDS	63,742
TRICHLOROETHYLENE	55,881
XYLENE (MIXED ISOMERS)	44,097
CHROMIUM COMPOUNDS	38,819

Table 4  
Top 10 1999 Army Installations  
(pounds released)

SIERRA ARMY DEPOT	5,390,239
RADFORD ARMY AMMUNITION PLANT	703,440
ANNISTON ARMY DEPOT	441,942
SCHOFIELD BARRACKS	175,227
HOLSTON ARMY AMMUNITION PLANT	147,850
RED RIVER ARMY DEPOT	102,543
DESERET ARMY CHEMICAL DEPOT	98,550
WATERVLIET ARSENAL	54,010
MCALISTER ARMY AMMUNITION PLANT	50,191
FORT BLISS	34,217

## NAVY TRI DATA

Table 1  
Change in Top 10 Navy Chemical Releases and Transfers in Pounds  
(based on 1994 baseline)

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
1,1,1-TRICHLOROETHANE	596,172	438,269	120,000	135,300	-	10	-100%
DICHLOROMETHANE	358,283	252,221	161,750	57,310	95,789	44,465	-88%
METHYL ETHYL KETONE	288,488	231,715	198,900	90,610	163,971	96,745	-66%
N-BUTYL ALCOHOL	184,055	131,463	137,372	126,837	157,191	117,999	-36%
NITRIC ACID	160,881	14,166	10,416	52,003	13,664	2,797	-98%
XYLENE (MIXED ISOMERS)	130,312	64,455	52,306	119,244	87,563	84,173	-35%
FREON 113	129,933	21,925	51,547	-	-	-	-100%
TOLUENE	92,078	15,352	29,959	32,800	26,500	12,260	-87%
PHENOL	48,068	31,949	31,490	-	9,950	-	-100%
COPPER	37,785	46,134	29,600	30,263	36,407	40,688	8%

Table 2  
Change in Top 10 Navy Installation Releases and Transfers in Pounds  
(based on 1994 baseline)

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
NORTHROP GRUMMAN CORP (VOUGHT)	462,481	496,710	249,900	256,800	134,170	187,083	-60%
NAS JACKSONVILLE	325,648	247,896	217,041	77,000	88,676	71,415	-78%
NAS ALAMEDA	227,500	-	-	-	-	-	-100%
NORFOLK NAVAL SHIPYARD	186,090	65,666	53,980	62,120	79,458	118,477	-36%
BETHESDA	184,602	-	-	-	-	-	-100%
PUGET SOUND NAVAL SHIPYARD	178,400	147,041	139,800	186,100	199,373	189,148	6%
NAVAL BASE NORFOLK	132,325	74,971	59,800	21,380	14,530	650	-100%
PHILADELPHIA NAVAL SHIPYARD	129,340	73,870	-	-	-	-	-100%
NAWC PATUXENT RIVER	76,174	-	-	-	-	-	-100%
NAVAL WEAPONS IND RESERVE PLANT	73,016	24,596	-	-	-	-	-100%

Table 3  
Top 10 1999 Navy Chemicals  
(pounds released)

N-BUTYL ALCOHOL	117,999
NITRATE COMPOUNDS	115,774
METHYL ETHYL KETONE	96,745
XYLENE (MIXED ISOMERS)	84,173
COPPER COMPOUNDS	51,615
DICHLOROMETHANE	44,465
COPPER	40,688
ZINC COMPOUNDS	27,859
NICKEL	24,584
LEAD	22,450

Table 4  
Top 10 1999 Navy Installations  
(pounds released)

PUGET SOUND NAVAL SHIPYARD	189,148
NORTHROP GRUMMAN CORP	187,083
NORFOLK NAVAL SHIPYARD	118,477
NAS JACKSONVILLE	71,415
NAS NORTH ISLAND	46,144
PEARL HARBOR NAVAL COMPLEX	27,590
NAS CORPUS CHRISTI	16,996
NIROP-ALLEGANY BALLISTICS LAB	16,120
NSWC PHILADELPHIA	13,014
NAVSTAT MAYPORT	11,260

## MARINE CORPS TRI DATA

Table 1  
Change in Top 10 Marine Corps Chemical Releases and Transfers in Pounds  
(based on 1994 baseline)

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
ETHYLENE GLYCOL	237,821	86,708	61,892	32,409	28,340	6,266	-97%
DICHLOROMETHANE	155,986	98,300	15,000	-	-	-	-100%
METHYL ETHYL KETONE	144,653	128,588	127,600	59,250	55,971	33,741	-77%
1,1,1-TRICHLOROETHANE	76,062	48,289	-	-	-	-	-100%
TOLUENE	68,054	53,350	37,000	8,900	6,600	10,054	-85%
XYLENE (MIXED ISOMERS)	51,535	37,416	21,400	5,600	3,800	3,243	-94%
FREON 113	28,000	27,000	-	-	-	-	-100%
GLYCOL ETHERS	28,000	47,000	20,000	4,300	12,500	-	-100%
CHROMIUM	25,897	-	-	-	-	-	-100%
N-BUTYL ALCOHOL	24,001	8,200	-	-	-	-	-100%

Table 2  
Change in Top 10 Marine Corps Installation Releases and Transfers in Pounds  
(based on 1994 baseline)

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
MCLB BARSTOW	322,011	87,961	31,304	16,846	36,536	2,680	-99%
MCLB ALBANY	282,273	254,340	133,200	32,490	13,293	38,920	-86%
MCAS CHERRY PT	263,370	216,673	110,091	33,664	39,472	29,391	-89%
MCB CAMP LEJEUNE	31,630	-	835	4,270	373	326	-99%
USMC BLOUNT ISLAND COMMAND	20,000	-	10,700	-	-	-	-100%
MCAS YUMA	1,050	1,028	-	-	-	-	-100%
MCB QUANTICO	34	36	37	37	24	-	-100%
MC RECRUIT DEPOT PARRIS ISLAND	5	-	-	-	-	-	-100%
MCB CAMP PENDLETON	-	5,376	-	26,455	14,609	1,740	0%

Table 3  
Top 10 1999 Marine Corps Chemicals  
(pounds released)

METHYL ETHYL KETONE	33,741
N-METHYL-2-PYRROLIDONE	20,130
TOLUENE	10,054
ETHYLENE GLYCOL	6,266
XYLENE (MIXED ISOMERS)	3,243
BENZENE	62
NAPHTHALENE	1
NA	
NA	
NA	

Table 4  
Top 10 1999 Marine Corps Installations  
(pounds released)

MCLB ALBANY	38,920
MCAS CHERRY POINT	29,391
MCLB BARSTOW	2,680
MCB CAMP PENDLETON	1,740
MCAS BEAUFORT	440
MCB CAMP LEJEUNE	326
MCAS YUMA	0
USMC BLOUNT ISLAND COMMAND	0
NA	
NA	

## AIR FORCE TRI DATA

Table 1  
**Change in Top 10 Air Force Chemical Releases and Transfers in Pounds  
 (based on 1994 baseline)**

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
DICHLOROMETHANE	1,534,992	1,116,400	704,119	588,776	413,363	310,537	-80%
METHYL ETHYL KETONE	840,937	584,235	507,067	406,933	316,214	210,442	-75%
PHENOL	363,920	234,835	92,745	87,281	66,841	52,144	-86%
TETRACHLOROETHYLENE	335,798	217,340	241,835	195,572	69,838	70,815	-79%
1,1,1-TRICHLOROETHANE	333,459	127,882	76,501	41,152	12,000	-	-100%
TOLUENE	225,563	133,460	90,287	58,658	44,753	80,528	-64%
ETHYLENE GLYCOL	162,300	40,916	144,009	77,534	113,384	76,670	-53%
CHROMIUM COMPOUNDS	151,886	56,898	52,246	49,470	35,500	33,400	-78%
GLYCOL ETHERS	139,390	30,193	44,076	45,396	44,100	38,330	-73%
MANGANESE COMPOUNDS	136,000	-	-	-	-	-	-100%

Table 2  
**Change in Top 10 Air Force Installation Releases and Transfers in Pounds  
 (based on 1994 baseline)**

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
TINKER AFB	1,569,614	1,080,881	728,670	520,020	325,423	304,656	-81%
ROBINS AFB	776,616	578,562	334,898	403,058	368,442	322,549	-58%
AF PLANT 06 (LOCKHEED MARTIN)	554,555	507,909	292,613	133,400	71,924	41,200	-93%
OGDEN AIR LOGISTICS CENTER (HILL AFB)	367,909	263,560	294,815	234,029	250,301	251,551	-32%
KELLY AFB	342,871	227,663	144,014	100,850	42,500	64,010	-81%
MCCLELLAN AFB	340,750	231,800	279,100	162,161	64,100	20,700	-94%
ARNOLD ENGINEER DEVELOP CNT	154,096	125,833	131,966	93,992	94,779	60,570	-61%
EDWARDS AFB	132,062	-	-	-	-	22,009	-83%
AF PLANT 44 (HUGHES SYSTEM)	123,430	35,502	18,800	3,100	-	-	-100%
AF PLANT 03 (ROCKWELL INTERNATIONAL)	123,413	37,355	46,026	-	-	-	-100%

Table 3  
**Top 10 1999 Air Force Chemicals  
 (pounds released)**

DICHLOROMETHANE	310,537
METHYL ETHYL KETONE	210,442
NITRATE COMPOUNDS	209,691
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	90,000
TOLUENE	80,528
ETHYLENE GLYCOL	76,670
TETRACHLOROETHYLENE	70,815
PHENOL	52,144
CERTAIN GLYCOL ETHERS	38,330
METHYL ISOBUTYL KETONE	34,329

Table 4  
**Top 10 1999 Air Force Installations  
 (pounds released)**

ROBINS AFB	322,549
TINKER AFB	304,656
OGDEN AIR LOGISTICS CENTER	251,551
WRIGHT-PATTERSON AFB	90,000
AF PLANT 4	89,209
KELLY AFB	64,010
ARNOLD AFB	60,570
AF PLANT 6	41,200
EDWARDS AFB	22,009
MCCLELLAN AFB	20,700

DEFENSE LOGISTICS AGENCY TRI DATA

Table 1  
**Change in Top 10 DLA Chemical Releases and Transfers in Pounds  
 (based on 1994 baseline)**

CHEMICAL NAME	1994	1995	1996	1997	1998	1999	94-99% difference
TOLUENE	10,890	-	-	-	-	-	-100%
CYCLOHEXANE	8,037	-	-	-	-	-	-100%
BENZENE	6,353	-	-	-	-	-	-100%
NAPHTHALENE	2,919	-	-	-	-	-	-100%
METHANOL	2,908	-	-	-	-	-	-100%
XYLENE (MIXED ISOMERS)	2,648	-	-	-	-	-	-100%
BROMOTRIFLUOROMETHANE	1,372	3,685	645	800	3,448	2,980	117%
BROMOCHLORODIFLUOROMETHANE	960	707	1,687	800	1,525	1,474	54%
ETHYLBENZENE	494	-	-	-	-	-	-100%
DICHLORODIFLUOROMETHANE	100	485	1,513	500	226	915	815%

Table 2  
**Change in Top 10 DLA Installation Releases and Transfers in Pounds  
 (based on 1994 baseline)**

INSTALLATION NAME	1994	1995	1996	1997	1998	1999	94-99% difference
GRAND FORK FUEL SUPPORT POINT	10,872	-	-	-	-	-	-100%
VERONA FUEL SUPPORT POINT	5,516	-	-	-	-	-	-100%
CHARLESTON FUEL SUPPORT POINT	4,274	-	-	-	-	-	-100%
LANGER JEWEL BEARING PLANT	3,000	-	-	-	-	-	-100%
ESCANABA FUEL SUPPORT POINT	2,819	-	-	-	-	-	-100%
DEFENSE SUPPLY CENTER RICHMOND	2,432	5,101	4,854	2,200	5,545	5,670	133%
SEARSPORT FUEL SUPPORT POINT	1,780	-	-	-	-	-	-100%
SAN PEDRO FUEL SUPPORT POINT	1,200	-	-	-	-	-	-100%
TAMPA FUEL SUPPORT POINT	1,175	-	-	-	-	-	-100%
MELVILLE FUEL SUPPORT POINT	1,035	-	-	-	-	-	-100%

Table 3  
**Top 10 1999 DLA Chemicals  
 (pounds released)**

BROMOTRIFLUOROMETHANE	2,980
BROMOCHLORODIFLUOROMETHANE	1,474
DICHLORODIFLUOROMETHANE (CFC-12)	915
DICHLOROTETRAFLUOROETHANE	301
NA	
NA	
NA	
NA	
NA	
NA	

Table 4  
**Top 10 1999 DLA Installations  
 (pounds released)**

DEFENSE SUPPLY CENTER RICHMOND	5,670
NA	
NA	
NA	
NA	
NA	
NA	
NA	
NA	
NA	

## AN EXPLANATION OF TERMS USED

### AIR RELEASES

Releases to air are reported either as stack or fugitive emissions. Stack emissions are releases to air that occur through confined air streams, such as stacks, vents, ducts, or pipes. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

### SURFACE WATER RELEASES

Releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases caused by runoff, including storm water runoff, are also reportable under TRI.

### LAND RELEASES

Releases to land covered under TRI are those that occur within the boundaries of the reporting facility. Releases to land include disposal of toxic chemicals into landfills, land treatment/application farming (in which waste containing a listed chemical is applied to or mixed with the soil), surface impoundments (which are uncovered holding areas used to volatilize and/or settle waste materials), and other land disposal (such as spills, leaks, or waste piles).

### UNDERGROUND INJECTION

Underground injection is a contained release of fluid into a subsurface well for the purpose of waste disposal.

### RECYCLING

Toxic chemicals can be either recycled on-site or sent off-site for recycling. The toxic chemicals may be recovered or regenerated by a variety of methods, including solvent recovery, metals recovery, and acid regeneration. Once recycled, these chemicals may be returned to the installation or sold for further processing or use. The quantity reported as on-site recycling in the Form R represents the quantity recovered at the facility, not the quantity that entered the recycling operation. The quantity reported as off-site recycling in the Form R represents the quantity that left the installation boundary for recycling, not the amount recovered at the off-site location.

### DESTRUCTION

Toxic chemicals can be destroyed on-site using a variety of methods. After destruction, no further treatment or transfer to an off-site location is necessary. The quantity reported in the Form R represents the quantity of the toxic chemical that was destroyed in the on-site waste treatment operations, not the amount that entered any treatment operation.

### TREATMENT

Toxic chemicals may be sent off-site for treatment using a variety of methods, including biological treatment, neutralization, incineration, stabilization, and physical separation. These methods result in varying degrees of destruction of the toxic chemical.

### POTWS

Toxic chemicals can be transferred off-site to a publicly owned treatment works (POTW). Wastewaters are transferred through pipes or sewers to a POTW. Not all TRI chemicals can be treated or removed by a POTW. The quantity reported in the Form R represents the quantity of the toxic chemical that left the installation boundary for POTW treatment, not the amount that was destroyed at the off-site location.

### DISPOSAL

Toxic chemicals sent off-site to a facility for disposal generally are either released to land or injected underground at the off-site location.

### ENERGY RECOVERY

Toxic chemicals can be either processed on-site or sent off-site for energy recovery. The toxic chemicals are combusted in industrial furnaces or boilers that generate heat or energy for use at that location. Treatment of chemicals by incineration is not considered to be energy recovery. The quantity reported as on-site energy recovery in the Form R represents the quantity of toxic chemicals that was destroyed in the combustion process, not the amount that entered the energy recovery unit. The quantity reported as off-site energy recovery in the Form R represents the quantity of toxic chemical that left the installation boundary for recovery, not the amount destroyed at the off-site location.