

# Chapter 9

## Estimate of Resources

Section 301(h)(1)(G) of CERCLA requires EPA to estimate the resources needed by the federal government to complete Superfund implementation. The Agency interprets this requirement as the cost of completing cleanup at sites currently on the National Priorities List (NPL). Much of this work will occur after FY92.

Section 9.1 of this chapter includes annual information on Trust Fund resources obligated by EPA and other federal departments and agencies through FY92. An estimate of the long-term costs of cleaning up sites on the existing NPL is included in Section 9.2, together with an overview of the estimating method used. The estimate includes Trust Fund resource projections for EPA and other federal departments and agencies funded through the Trust Fund for FY93 and beyond. The estimate does not include the cost incurred by other federal agencies to clean up their sites, or potentially responsible party (PRP) contributions. Finally, Section 9.3 provides information submitted to EPA by other federal departments and agencies on their resource needs (from the Trust Fund and within their agency budgets) for FY89 to FY92, and describes their Superfund activities.

The long-term resource estimate provided in Section 9.2 is based primarily on the responsibilities and duties assigned to EPA and other federal departments and agencies by Executive Order 12580. Computing such an estimate entails making assumptions about the size and scope of the Superfund program, the nature and number of response actions, participation by states and private parties, and the increasing use of treatment technologies. For active NPL sites (those that have reached or passed the remedial investigation/feasibility study (RI/FS)

planning stage), these assumptions relate to management of the workload already in the remedial pipeline and the costs of those actions. For NPL sites that have not yet entered the RI/FS planning stage, the estimating method uses many assumptions about which activities will be necessary to clean up the sites and delete them from the NPL.

In developing the long-term resource estimate, EPA considered several sources of information:

- EPA Superfund budgets and budget estimates for FY89 through FY92, including budget requests from other federal departments and agencies;
- Data submitted to EPA by other federal departments and agencies under an approved General Services Administration (GSA) Interagency Report Control Number, issued on February 5, 1988, as required under the provisions of 41 *CFR* Part 201-45.6;
- The Federal Agency Hazardous Waste Compliance Docket developed under Section 120(c) of CERCLA and each federal department's and agency's annual report to Congress on federal facility cleanup as required under Section 120(e)(5) of CERCLA; and
- Various EPA information systems, primarily the CERCLA Information System (CERCLIS) and the Integrated Financial Management System.

Specifically, EPA has estimated resource needs for FY93, and beyond. The Agency is working to identify data requirements, improve data quality, develop cost estimating methods, and collect additional information. This long-term effort has

Acronyms Referenced in Chapter 9	
ATSDR	Agency for Toxic Substance and Disease Registry Cooperative Agreement
CA	Consent Decree
CD	CERCLA Information System
CERCLIS	Department of Energy
DOE	Department of the Interior
DOI	Department of Justice
DOJ	Federal Aviation Administration
FAA	Federal Emergency Management Agency
FEMA	General Services Administration
GSA	Interagency Agreement
IAG	Maritime Administration
MARAD	National Aeronautics and Space Administration
NASA	National Oil and Hazardous Substances Pollution Contingency Plan
NCP	Contingency Plan
NIEHS	National Institute of Environmental Health Sciences
	National Oceanic and Atmospheric Administration
NOAA	National Priorities List
NPL	National Response Team
NRT	Outyear Liability Model
OLM	On-Scene Coordinator
OSC	Occupational Safety and Health Administration
OSHA	Potentially Responsible Party
PRP	Remedial Action
RA	Remedial Investigation/Feasibility Study
RI/FS	Record of Decision
ROD	Regional Response Team
RRT	Research and Special Program Administration
RSPA	Tennessee Valley Authority
TVA	United States Coast Guard
USCG	United States Department of Agriculture
USDA	Department of Veterans Affairs
VA	

been coordinated with the development of the FY94 budget. In conjunction with the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and its policies affecting program direction and scope, EPA is moving closer to a more complete cost estimate for implementing CERCLA. The initial results of this effort are presented in Section 9.2 of this chapter.

EPA's ability to project the federal resource requirement for CERCLA implementation improves each year as more experience is gained. Improved coordination with other federal departments and agencies, and additional data on the implementation of the federal facilities requirement of Section 120 will also increase the accuracy of future resource estimates.

## 9.1 SOURCE AND APPLICATION OF SUPERFUND RESOURCES

Since the enactment of CERCLA in 1980, Congress has provided Superfund with \$10.5 billion in budget authority (FY81 through FY92). This includes \$1.7 billion for FY81 through FY86, and \$8.8 billion for the post-SARA period, FY87 through FY92. The FY92 budget allocated total resources of nearly \$1.8 billion targeted for the following activities:

- *The Response Program* uses 79 percent of Superfund resources. Response program activities include site assessment, time-critical and non-time-critical removals, long-term clean-up actions, and program implementation activities. Also included is support provided by the Office of Water, the Office of Air and Radiation, and other federal agencies.
- *The Enforcement Program* uses 11 percent of Superfund resources. Enforcement activities include PRP negotiations, litigation, and settlements and cost recovery efforts.
- *Management and Support* uses 7 percent of Superfund resources. This category includes program analysis provided by the Office of Program Planning and Evaluation; personnel, contracting, and financial management services from the Office of Administration and Resources Management; legal services provided by the Office of General Counsel; and the audit function provided by the Office of the Inspector General.
- *Research and Development* uses 3 percent of Superfund resources for the study and validation of new environmental technologies.

Exhibit 9.1-1 presents a snapshot of the allocation of Superfund resources for FY91 and FY92 within these categories.

**Exhibit 9.1-1**  
**EPA Superfund Obligations**  
(in Millions)

Program Area	FY91 Actuals	FY92 President's Actuals
Response Program (Total)	\$1,169.4	\$1,402.7
EPA	1,032.0	1,248.9
Other Federal Agencies	137.4	153.8
Enforcement Program	173.8	191.1
Management and Support	126.8	121.5
Research and Development	83.7	65.0
<b>TOTAL SUPERFUND</b>	<b>\$1,553.7</b>	<b>\$1,780.3</b>

Source: Superfund Budget Documentation.

E51-013-11B

### 9.1.1 Estimating the Scope of Cleanup

Site cleanup is the single largest category of Superfund expenditures and is expected to remain so in the future. To project EPA funding needs for clean-up activities, several key estimations were made, including

- The projected number and average cost of studies, remedial designs, and remedial actions (RAs) undertaken;
- The extent and cost of removal activity; and
- The proportion of direct clean-up actions undertaken by PRPs.

### 9.1.2 PRP Contributions to the Clean-Up Effort

The most significant way PRPs contribute to the hazardous substance clean-up effort is by undertaking and financing remedial activities (whether voluntarily or under order). When PRPs finance site clean-up efforts, potential EPA Superfund obligations for those sites are dramatically reduced; the principal remaining cost is PRP oversight. EPA continues to develop and implement policies designed to encourage PRP cleanups.

In addition to remedial and removal actions actually undertaken by PRPs, a portion of the costs of certain Fund-financed response actions will be recovered from PRPs through enforcement activities. Typically, there are significant delays between expenditures from the Trust Fund and recovery of costs.

## 9.2 ESTIMATED RESOURCES TO COMPLETE CURRENT NPL SITES

Estimating the cost of cleaning up current NPL sites depends on a number of factors, many of which will change as the program continues to mature. The main factors are

- Changes in Superfund program policies and procedures because of the revised NCP, particularly the clean-up standards as required under Section 121 of CERCLA;
- Changes in the remedial program because of revisions to the Hazard Ranking System, as required under Section 105 of CERCLA;
- The long period required to identify, develop, select, and construct a remedy, and the need for scheduling flexibility to maximize the impact of enforcement activities;
- The level of state Superfund program activity;
- The level of PRP participation in the program; and
- The nature of and demand for removal actions.

Based on these factors, EPA uses the Outyear Liability Model (OLM) to estimate the long-term resource needs of Superfund. The OLM provides meaningful long-range forecasts with the flexibility to refine them. The model can be adjusted for a large number of program-related variables. These variables can be individually adjusted to reflect real or anticipated changes in the program.

The OLM uses three distinct methods, each based on the status of a site in the remediation process:

- Active NPL sites;
- NPL sites where the remedial process has not yet begun; and
- Non-site activities.

EPA’s estimate of resources required to clean up the existing NPL sites is provided in Section 9.2.1. To develop this estimate, the Agency has concentrated on the remedial and removal programs. These programs are the major components of the Superfund program and account for the majority of Fund expenditures by the Agency. Section 9.2.2 describes these and other key OLM features.

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### 9.2.1 Estimated Cost to Complete Existing NPL Sites

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As illustrated in Exhibit 9.2-1, EPA’s estimate of the total Trust Fund liability to complete cleanup of existing NPL sites is \$26.9 billion. This total includes the OLM estimate of \$16.5 billion for FY93 and beyond. Major assumptions shaping the long-term estimate include

- The OLM estimates only the Trust Fund cost of the existing NPL (1,275 sites, including 1,183 final, 52 proposed, and 40 deleted sites as of September 30, 1992).

**Exhibit 9.2-1**  
**Estimate of Total Trust Fund Liability to Complete Cleanup at Sites on the National Priorities List**  
*(in Millions)*

	Total Allocations
FY92 and Prior	\$10,459.5
FY93 and beyond	16,465.8
<b>TOTAL</b>	<b>\$26,925.3</b>

Source: Superfund Budget Documentation and Outyear Liability Model. 51-013-12D

- Removal activities at sites on the NPL remain at current levels.
- The RA cost estimate is \$12.2 million. FY92 analyses of RA cost factors (choice of technology, site size, and technology cost) have led to a decrease in the RA cost estimate.
- Program support and other non-site elements are straightlined at the levels of the FY94 President’s budget.
- Approximately 35 percent of all new RI/FS starts will be Fund-financed (i.e., the Trust Fund will pay at least 90 percent of the cost).
- For non-federal facility sites, PRPs will take the lead on 70 percent of the RAs. Oversight is significantly less expensive than cleanup; therefore, Fund costs drop dramatically when PRPs assume financial responsibility for more cleanups.
- The OLM does not generate a resource estimate for the federal facility program. Resource and programmatic assumptions have not been included in the OLM for federal facility sites.

Assumptions about the future reflect planning assumptions taken from the Superfund Program Management Manual and historical performance averages, both of which are revised periodically. EPA will continue to monitor developments that affect program costs. Changes will be incorporated into the Model as they occur, improving depiction of future programmatic direction and refining previous analysis. OLM estimates will vary over time as a result, and subsequent editions of this report will most likely contain revised estimates.

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### 9.2.2 Program Element Assumptions Represented in the Model

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To provide a better estimate of the cost of the Superfund program and the flexibility needed to estimate the costs of future initiatives, the Model includes many variables representing specific program elements.

## Currently Active Sites

Remedial efforts are underway at most of the sites on the existing NPL. Remedial plans are being developed for the remaining sites on the NPL, leaving only 56 sites on the existing NPL that were inactive at the end of FY92.

Data on the active NPL sites are stored in CERCLIS and incorporated into the OLM to present the most accurate picture of planned activities. The OLM estimates ancillary activities for sites at which some level of planning or remediation activity is underway. Because most of the existing NPL sites are active, they constitute a large portion of the total liability estimate.

In addition to planned remedial activities, enforcement activities have a significant impact on the costs of addressing Superfund sites. All enforcement activities are estimated by the Model according to past program experience and several standard sequences of activities, each representing a different enforcement approach. Enforcement-related variables within the Model include costs, workyears, and the shift in remedial costs when Superfund assumes responsibility from, or passes responsibility to, a PRP. As with remedial activities, most enforcement costs and workyears are estimated.

## Sites Yet To Begin the Remedial Process

The OLM uses the same general approach for all sites where the remedial process has yet to begin. Cleaning up an NPL site involves a number of different activities occurring over time and in predictable arrangements. For sites where the remedial process has yet to begin, the OLM must first approximate the activities that will be involved when remediation of the sites begins. Approximations are made by applying several "generic" activity sequences to the number of sites being estimated. When the activities have been set, cost and workyear pricing factors are applied to estimate the necessary resources. A consistent approach is used for all site-related activities, both remedial and enforcement. In the approach, tradeoffs such as avoiding clean-up costs but incurring PRP oversight costs are handled automatically as assumptions are adjusted.

The OLM includes a library of different activity sequences. Each sequence represents a "typical" site and involves different activities, durations, and schedules. In addition to the key activity starts discussed above, the OLM includes a number of other factors to control the mix of these activity sequences.

## Non-Site Costs

Although non-site activities comprise a portion of the budget, individually they are fairly small and stable. For these reasons, resource needs for these activities are estimated by applying annual factors to the levels included in the FY94 President's budget.

Aside from the number of sites requiring cleanup and the cost of individual cleanups, the assumption of managerial and financial responsibility for a site has the largest potential impact on the cost of the Superfund program. There are many factors involved in establishing who is responsible for a site (referred to as the site "lead"), including

- Level of emphasis on the enforcement program;
- Willingness of states to assume financial responsibility; and
- Cost-sharing arrangements between Superfund and the states and between Superfund and the PRPs.

The Model accommodates each of these factors with one or more variables, allowing the estimation of Superfund liabilities across a wide range of site-lead and cost-sharing scenarios. Related site variables include

- Proportion of sites addressed by each lead category (Fund, PRP, state, state enforcement, and federal facility);
- Number of sites that are owned and/or operated by state or local governments; and
- Number of sites that follow each of several enforcement paths.

Choices among these variables generally affect both cost and duration of the program. Increases in PRP leads will ultimately result in lower Fund costs,

but related litigation may extend the amount of time required to reach deletion.

### Factors Related to Remedial Action Costs

The method of estimating RA costs is based on analysis of RODs signed from FY87 through FY92. A statistical analysis of RA cost estimates contained in these RODs identified seven distinct cost patterns based on the choice of remedial technology. For each technology type there is a unique average cost and expected treatment volume. These factors, together with the expected usage of each technology, are the factors that control the RA cost module of the OLM.

Adjustments within the RA cost module make it possible to estimate the fiscal impact of

- Policies affecting the selection of technological approach (e.g., using more treatment and less containment);
- Changes in the contaminants found on site (e.g., if remaining sites have higher levels of heavy metals than prior sites, incineration would be less effective);
- Changes in technology costs; and
- Changes in site size.

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## 9.3 ESTIMATES OF RESOURCES NECESSARY FOR OTHER EXECUTIVE BRANCH DEPARTMENTS AND AGENCIES TO COMPLETE SUPERFUND IMPLEMENTATION

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The second element in fulfilling the requirements of Section 301(h)(1)(G) of CERCLA is providing an estimation of the resources needed by other federal departments and agencies for CERCLA implementation. There are no projections of future needs available for other agencies. The Superfund-related resource needs of the other Executive Branch departments and agencies for Superfund are met

through two sources: the Trust Fund and the individual federal department or agency budgets.

Trust Fund monies are provided to other federal agencies through two mechanisms:

- *Interagency Budgets*: EPA provides Trust Fund monies to other federal departments and agencies that support EPA's Superfund efforts. This is accomplished through an interagency budget under Executive Order 12580.
- *Site-Specific Agreements*: EPA also provides money from the Trust Fund to other federal departments and agencies through site-specific agreements.

Federal departments and agencies also allocate monies from their budgets for Superfund-related activities through CERCLA-specific funds and general funds of the department or agency.

Exhibit 9.3-1 summarizes reported expenditures (both Trust Fund and agency budgets) from FY89 to FY92 of other federal departments and agencies. The following information was provided by the respective departments and agencies to describe their resource needs and Superfund activities.

### Department of Agriculture

The U.S. Department of Agriculture (USDA) initiated a special program in FY88 to achieve compliance with the statutory and regulatory requirements of CERCLA. The program includes preassessment, assessment, removal, and remedial activities at USDA facilities throughout the United States.

The USDA has 96 sites listed on the Federal Agency Hazardous Waste Compliance Docket. None of these sites are currently listed on the NPL, but several might be added to the list in the future. The USDA sites on the docket are primarily the responsibility of the Agricultural Research Service, Farmers Home Administration, and Forest Service. Other USDA agencies, including the Animal Plant and Health Inspection Service, Commodity Credit Corporation, Food Safety Inspection Service, and Soil Conservation Service, also have a small number of CERCLA activities underway.

In general, USDA agencies have completed an

**Exhibit 9.3-1**  
**CERCLA Resource Needs and Interagency Funding for Other Federal Departments and Agencies**  
*(Dollars in Millions)*

Federal Departments and Agencies	FY89 Actual		FY90 Actual		FY91 Actual		FY92 Actual		FY89-FY92 Total	
	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget	Trust Fund	Agency Budget
Agriculture	--	2.6	--	13.3	--	12.8	--	27.7	--	56.4
Commerce (NOAA)	2.3	0.9	2.2	0.9	2.2	1.1	2.2	1.3	8.9	4.2
Defense	--	--	--	601.3	--	1,065.0	--	1,129.4	--	2,795.7
Energy	--	112.8	--	431.6	--	1,000.0	--	1,444.6	--	2,989.0
FEMA	2.0	--	1.7	1.0	1.7	1.4	1.8	--	7.2	2.4
General Services Administration	--	--	--	--	--	--	--	0.4	--	0.4
Health and Human Services										
ATSDR	44.5	--	45.2	--	48.5	--	56.5	--	194.7	--
NIEHS	21.9	--	36.3	--	41.9	--	51.1	--	151.2	--
Interior	1.1	9.0	1.1	34.1	1.2	59.0	1.2	70.4	4.6	172.5
Justice	22.1	--	28.8	--	32.8	--	35.5	--	119.2	--
Labor (OSHA)	--	0.4	--	1.0	--	0.7	--	0.7	--	2.8
NASA	--	0.6	--	5.7	--	3.9	--	2.4	--	12.6
Tennessee Valley Authority	--	--	--	--	--	--	--	4.3	--	4.3
Transportation	--	5.8	--	7.3	--	12.5	--	20.5	--	46.1
Veterans Affairs	--	5.0	--	12.0	--	2.0	--	2.0	--	21.0
<b>Total</b>	<b>93.9</b>	<b>137.1</b>	<b>115.3</b>	<b>1,108.2</b>	<b>128.3</b>	<b>2,158.4</b>	<b>148.3</b>	<b>2,703.7</b>	<b>485.8</b>	<b>6,107.4</b>

Source: Office of Program Management.

51-013-13F

inventory and discovery process for USDA-owned facilities or managed lands with the following exceptions:

- The Forest Service has not completed an inventory of potential problems on the 190 million acres of land it manages with respect to abandoned mining sites or closed sanitary landfills. Most of these sites are the result of third-party activities on national forest lands that have occurred in the past under authorizing
- The Forest Service acts on behalf of the Secretary of Agriculture as a federal trustee for natural resources on lands it manages that have been damaged by releases of hazardous substances. The inventory of such sites has not yet clearly been established. The Forest Service also acts for USDA in providing support and assistance to

the National Response System through the National Response Team (NRT) and the Regional Response Teams (RRTs).

### Department of Commerce

The National Oceanic and Atmospheric Administration (NOAA) carries out many of the responsibilities of the Department of Commerce under CERCLA. NOAA's CERCLA goals are to (1) reduce risks to coastal habitats and resources from hazardous chemical releases through preparedness and response activities; (2) protect and restore NOAA trust habitats and resources affected by hazardous waste sites in coastal areas and; (3) enhance the state of knowledge about hazardous material interactions in coastal environments through research, development, and technology transfer.

NOAA accomplishes these goals through two networks of regional coordinators:

- NOAA's Coastal Resource Coordinators work with EPA to evaluate natural resource concerns at coastal hazardous waste sites and to ensure coordination among state and federal natural resource trustees. This work is funded largely through CERCLA. When threats to natural resources cannot be addressed through CERCLA remedial actions, NOAA may seek to repair natural resource damages through its Damage Assessment and Restoration Program. This program is funded separately from CERCLA.
- NOAA's Scientific Support Coordinators provide U.S. Coast Guard (USCG) and EPA On-Scene Coordinators (OSCs) with scientific and technical expertise in planning for and responding to oil and hazardous material releases. Scientific Support Coordinators seek to mitigate the effects of a release into coastal areas. Their work is funded by NOAA.

### Department of Defense

The Department of Defense (DOD) has the authority and responsibility under CERCLA to clean up contamination associated with past activities. In 1984, DOD increased its emphasis on hazardous waste cleanup when Congress established the Defense

Environmental Restoration Program. Under this program, DOD identifies, investigates, and cleans up environmental contamination from past activities for which DOD is responsible following the procedures of the NCP.

At the close of FY92, DOD owned and/or operated 814 sites listed on the Federal Agency Hazardous Waste Compliance Docket.

### Department of Energy

The Department of Energy (DOE) is committed to conducting its operations in a safe and environmentally sound manner and to preventing, identifying, and correcting environmental problems during present and future operations.

DOE has issued guidance establishing policies and procedures for clean-up activities conducted under CERCLA. DOE has also developed a Five-Year Plan that will be updated annually and will integrate planning for corrective activities, environmental restoration, and waste management operations at its facilities. DOE conducts assessments at its operating facilities to monitor environmental compliance and follow up on findings. Compliance with environmental laws, regulations, and requirements is an integral part of operations at DOE facilities to ensure that risk to human health and to the environment posed by past, present, and future operations are eliminated or reduced to safe levels.

During FY92, DOE made significant progress in reaching agreements with regulatory entities, undertaking clean-up actions, and initiating preventive measures to eliminate future environmental problems. In accordance with CERCLA Section 120, DOE initiated remedial activities at all 17 DOE sites listed on the NPL, including removal actions, interim actions, and the initiation of final remediation activities. The 17 DOE NPL sites include Brookhaven National Laboratory Site, New York; Fernald Environmental Management Project (formerly known as Feed Materials Production Center), Ohio; Hanford Site, Washington; Idaho National Engineering Laboratory Site, Idaho; Lawrence Livermore National Laboratory-Main Site, California; Lawrence Livermore National Laboratory-Site 300, California;

Maywood Site, New Jersey; Monticello Mill Site, Utah; Monticello Vicinity Properties, Utah; Mound Plant, Ohio; Oak Ridge Reservation, Tennessee; Rocky Flats Plant, Colorado; Ross Complex, Washington; Savannah River Site, South Carolina; St. Louis Site, Missouri; Wayne Site, New Jersey; and Weldon Spring Site Remedial Action Project, Missouri. Since FY90, no additional DOE facilities have been listed on the NPL, and only one site (Pantex Plant, Texas) has been proposed for listing.

During FY92, DOE executed four CERCLA Section 120 interagency agreements (IAGs) for Oak Ridge Reservation, Tennessee; Brookhaven National Laboratory Site, New York; Weldon Spring Site, Missouri; and Lawrence Livermore National Laboratory-Site 300, California. DOE and EPA also began renegotiation of existing IAGs for Mound Plant, Ohio, and Weldon Spring Site, Missouri, to add the State of Ohio and the State of Missouri, respectively, as parties to the IAGs.

## Department of Health and Human Services

*Agency for Toxic Substances and Disease Registry:* The Agency for Toxic Substances and Disease Registry (ATSDR) is a part of the Public Health Service within the U.S. Department of Health and Human Services. ATSDR's mission is to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances. ATSDR is charged under CERCLA with various responsibilities, including emergency response; public health assessments, toxicological profiles, health studies, surveillance, and registries; and health education. ATSDR activities to fulfill these responsibilities are highlighted below.

ATSDR's emergency response staff is responsible for providing health-related technical support to federal, state, and local responders during emergencies caused by the release of hazardous substances. ATSDR Emergency Response Coordinators have immediate access to a wide variety of professional experts including chemists, toxicologists, environmental scientists, and medical professionals. At the request of EPA Regional offices, other federal agencies, and state and local agencies,

ATSDR emergency response personnel made five on-site emergency responses and responded to requests for information related to 83 other acute events during FY92.

ATSDR participated in four simulated hazardous substances emergencies, averaging 60 participants each. Approximately 400 representatives from federal, state, and local agencies and organizations observed the simulated emergencies. ATSDR also participated in 12 smaller scale hazardous material event simulations.

Through its cooperative agreement (CA) program, ATSDR supported emergency response activities in five state health departments, improving the capability of participating states to respond to an emergency involving hazardous substances. In addition, ATSDR prepared approximately 500 health consultations and provided technical assistance to address approximately 400 other requests from EPA and other federal, state, or local agencies and organizations.

ATSDR and states in ATSDR's CA program prepared a total of 233 public health assessments, including 19 petitioned health assessments. ATSDR also conducted 118 reviews and updates of sites that were assessed early in the agency's existence and prepared summary reports for 23 lead initiative sites. In order to expand the states' abilities to produce public health assessments, ATSDR trained more than 80 state health assessors in the agency's current public health assessment methods.

At the request of EPA, ATSDR personnel and staff from states in the CA program evaluated 47 RODs and 39 RI/FS workplans to determine whether proposed remedial alternatives would minimize sites' existing and future impacts on public health.

ATSDR conducts studies of the human health effects of toxic substances for selected groups of exposed individuals. Many environmental exposures occur at levels that do not result in acute illness, but which might cause unrecognized biologic changes. In FY92, a total of 17 studies and surveillance projects were completed, and 34 studies and 21 surveillance projects were in progress.

ATSDR continued funding grants to support research into health effects related to one or more of

ATSDR priority health conditions, which include birth defects and reproductive disorders, cancer (selected anatomic sites), immune function disorders, kidney dysfunction, liver dysfunction, lung and respiratory diseases, and neurotoxic disorders. Six studies were in progress as of the end of FY92.

ATSDR supports the development of educational materials in environmental medicine for health professionals. More than 5,000 health professionals were trained in programs sponsored by ATSDR through CAs with state health departments. ATSDR also distributed over 110,000 copies of *Case Studies in Environmental Medicine* to health professionals. Nearly 1,800 health professionals received CME credit for their participation in the case studies program, which was reviewed and accepted for credit by the American Academy of Family Physicians, American College of Emergency Physicians, American Osteopathic Association, American Association of Occupational Health Nurses, and American Board of Industrial Hygiene. Five case studies were published in the journal of the American Academy of Family Physicians, *American Family Physician*. *Case Studies in Environmental Medicine: Nitrate/Nitrite Toxicity* was mailed in September 1992 to 38,000 members of the American Academy of Pediatrics because of the relevance of the document to the treatment of children.

*National Institute of Environmental Health Sciences*: The National Institute of Environmental Health Sciences (NIEHS) uses CERCLA funds to support its Worker Training Program and its Superfund Basic Research Program. NIEHS received \$20 million from the FY92 appropriations to support grants under its Worker Training Program for providing occupational safety training for workers that perform dangerous jobs or manage hazardous substance emergencies. Between 1987 and 1992, the first five years of the Worker Training Program, NIEHS supported 16 primary grantees representing consortia of over 60 different organizations and local government units. During this five-year period, the program has trained over 250,000 workers across the country in 8,000 classroom and hands-on training courses that have entailed almost five million contact

hours of actual training. Since the reauthorization of CERCLA in 1986, NIEHS has awarded 18 CAs to support training by eight labor organizations, five major multi-state university consortia, three joint labor-management trust funds, one community college consortium, and a non-profit occupational health center.

Now in its seventh year, the NIEHS Superfund Basic Research Program continues to provide research and training grants directed towards understanding, assessing, and attenuating the adverse effects on human health resulting from exposure to hazardous substances. Grants made under the program sponsor coordinated core research in biomedicine, including multicomponent interdisciplinary research in engineering, hydrogeology, and ecology. The research provides a broader and more detailed body of scientific information to be used by federal, state, and local agencies and by private organizations and industry in making decisions related to the management of hazardous materials.

As of FY92, NIEHS's Superfund Basic Research Program supported 18 research programs at 29 universities or institutions, encompassing more than 142 individual research projects. The following are three examples of ongoing research projects supported by the NIEHS:

- Research at the University of California explores new technologies for thermal and bioremediation of toxic wastes and seeks to identify new analytical technologies, including biomarkers, to evaluate the health effects of remediation. This research, which involves 36 scientists in ten projects and three cores, was developed in research collaborations and/or technology transfers among EPA, USDA, the U.S. Army Medical Research and Development Laboratory, the Department of Commerce, NOAA, the California Air Resources Board, Woods Hole Oceanographic Institute, and private organizations.
- Integrating biomedicine, epidemiology, ecology, and engineering disciplines, research at the New York University Medical Center assesses the

impact of hazardous waste exposure on human health, including new and sensitive methods for detecting human exposure to chemicals. This research involves 26 investigators involved in 11 projects and three cores.

- At the University of Washington, research continues on the development of biomarkers for the toxicological effects of hazardous waste chemicals. Research focuses on identifying biomarkers that may be predictive of exposure, adverse effects, and/or unusual susceptibility to toxic substances in the environment.

### Department of the Interior

Each of nine bureaus and four territorial elements of the Department of the Interior (DOI) provides support to the Superfund program, primarily in assisting the NRT and RRTs. DOI's role in the program focuses on three general areas:

- Response management, including RRT assistance activities, incident-specific activities, and NPL site remedial response activities;
- Emergency response preparedness, including RRT participation, regional RRT workgroups, and RRT support; and
- Trust resources/damage assessment, including coordination of national resource trustee concerns, natural resource damage assessment briefings, and settlements of trustee resources.

DOI is involved in the full range of response and remediation activities on its lands and at its facilities. Whenever feasible, DOI seeks to prevent the generation and acquisition of hazardous wastes, including minimizing waste generation through the use of sound waste management practices. DOI manages waste materials responsibility in order to protect the natural resources and the people who live, work, and enjoy its lands and facilities. DOI is committed to moving aggressively to clean up and restore areas under its care that are contaminated.

### Department of Justice

The Department of Justice (DOJ) is responsible for all judicial litigation brought under CERCLA.

This responsibility includes conducting CERCLA civil judicial litigation, representing EPA in bankruptcy proceedings, prosecuting criminal violations, conducting defensive and appellate litigation, and participating as *amicus curiae* on behalf of EPA, as required to support effective implementation of the statute. In addition, DOJ provides support in negotiating consent decrees (CDs) under Sections 106, 107 and 122 of CERCLA; processes CDs in accordance with approved interagency procedures; prepares and disseminates reports on litigative activities; and keeps EPA informed of other CERCLA actions consistent with the national program.

The enforcement efforts of DOJ play a critical role in the overall Superfund program. Successful judicial actions to recover clean-up costs and replenish the Trust Fund, and actions to compel PRPs to conduct clean-ups are integral parts of EPA's enforcement strategy.

Civil litigation efforts in support of the Superfund program have been extraordinarily successful. Since 1980, DOJ, together with EPA's enforcement efforts, has achieved over 1,800 judicial settlements valued at more than \$6 billion. Of this total, more than \$4 billion was recovered in the last four years. In FY92, DOJ filed 154 judicial complaints (matching the highest number filed in any previous year), assessed \$203 million through cost recovery actions, and forced defendants to undertake various clean-up activities valued at \$894 million. The number of active Superfund cases being litigated rose from 159 cases with 523 defendants in FY87 to 551 cases with 3,908 defendants at the beginning of FY93.

Superfund money provides DOJ with the necessary attorneys, support staff, expert witnesses, and litigation support vital to the CERCLA enforcement process.

### Department of Labor

Funds appropriated under general IAGs allow the Occupational Safety and Health Administration (OSHA) of the Department of Labor to provide EPA with technical assistance in the area of worker safety and health. SARA Section 126 requires OSHA to issue standards for employees engaged in hazardous

waste operations. Programs operated by OSHA or states with OSHA-approved plans protect workers at Superfund sites and support the NRT and RRTs.

OSHA performs laboratory analyses of samples collected during Superfund site inspections and maintains and calibrates technical equipment used for these inspections. OSHA develops interpretations of worker protection standards and maintains a computerized system for the interpretations and for tracking hazardous waste inspection activity. As a member of the NRT and the associated RRTs, OSHA provides assistance to these teams to complete their annual workplans, conduct paper audits of response plans, and perform technical assistance site visits.

### Department of Transportation

The Department of Transportation uses funding from its budget to support CERCLA-related activities carried out by the Federal Aviation Administration (FAA), the USCG, the Maritime Administration (MARAD), and the Research and Special Programs Administration (RSPA).

*Federal Aviation Administration:* CERCLA activities of the FAA involve pollution abatement and hazardous waste cleanup at regional facilities.

*United States Coast Guard:* The USCG supports the Superfund program by providing OSCs and incident control and clean-up specialists who respond to any release or threatened release of hazardous substances in the coastal zone. USCG also undertakes pollution abatement activities related to the operation of its own facilities.

*Maritime Administration:* MARAD's activities in support of CERCLA involve testing and cleanup of hydrocarbons in storage tank facilities at Kings Point and other locations.

*Research and Special Program Administration:* RSPA activities in support of CERCLA requirements include hazardous waste rulemaking and technical support, emergency response training, hazardous materials/hazardous substances incident reporting, and emergency preparedness curriculum development. In addition, RSPA is responsible for implementing a grant program for the states that was established by the Hazardous Materials Transportation Uniform Safety Act of 1990. This

grant program supports SARA-related emergency planning and training for accidents and incidents involving hazardous materials.

### Department of Veterans Affairs

From FY89 through FY92, the Department of Veterans Affairs (VA) budgeted \$21 million for Superfund cleanup and other construction activity related to hazardous waste. VA anticipates that it will make additional budgetary requests in the future to cover its liability under Superfund. At present, VA has been identified as a relatively small contributor of hazardous waste at about 10 Superfund sites.

### Federal Emergency Management Agency

The enactment of SARA in 1986 made many of the voluntary preparedness and planning activities of the Federal Emergency Management Agency (FEMA) ineligible for funding under the Superfund budget after September 30, 1987.

To continue the ongoing Superfund assistance to state and local governments and to support efforts to implement Title III of SARA, FEMA consolidated funding requests under two separate appropriation authorizations. Funding for Superfund activities was requested under the Superfund interagency budget. The remainder of FEMA's hazardous materials activities, including those authorized by SARA Title III, was incorporated into FEMA's own operating budget (under its technological hazards budget). Since FY87, no additional funds have been requested under CERCLA Section 301(h)(1)(G) to carry out Superfund activities.

Funding received under Superfund is used to provide guidance, technical assistance and interagency coordination for FEMA and multi-agency initiatives that support state and local responsibilities required under Superfund. Interagency coordination is accomplished primarily through the NRT/RRT structure. FEMA chairs the NRT preparedness and training committees and provides staff support to the NRT, RRTs, and supporting subcommittees.

FEMA activities in support of state and local governments include evaluating exercises focusing

on specific Superfund sites; providing guidance and technical assistance in the design and development of hazardous material exercises to include jurisdictions within and around Superfund sites; providing guidance and technical assistance in the development and revision of hazardous material plans addressing Superfund issues to ensure their adequacy and consistency with the NCP; providing training and course materials for constituencies involved in various Superfund clean-up activities; supporting the NRT-sponsored National Hazardous Materials Conference to coordinate efforts for improving hazardous material emergency preparedness nationwide; and completing the temporary and permanent relocation programs started in FY91 (e.g., Times Beach, Forest Glenn).

### General Services Administration

Resources for environmental studies and corrective projects are included in the GSA budget and can be used for CERCLA studies/corrective projects, if necessary. GSA does not have any sites on the NPL, although it has completed a cleanup at a non-NPL site.

### National Aeronautics And Space Administration

The National Aeronautics and Space Administration's (NASA's) environmental

compliance and restoration program was initiated in FY88 to ensure compliance with statutory environmental requirements. This program provides the means to conduct environmental compliance monitoring, site cleanups, and restoration measures at NASA field installations, government-owned industrial plants, and other locations where NASA is required to contribute to clean-up costs. CERCLA-related activities are being addressed as part of the program, including studies, assessments, RI/FSs, and RAs. During FY92, there were no NASA-owned sites listed on the NPL, but the revised Hazard Ranking System criteria may result in future listing of sites. As ongoing studies and assessments continue and pending regulatory reviews are completed, clean-up activities are expected to proceed.

### Tennessee Valley Authority

The Tennessee Valley Authority (TVA) is committed to operating and maintaining its facilities and properties in compliance with statutory environmental requirements.

The TVA has no facilities listed on the NPL, and none of its facilities have been proposed for listing. TVA, however, is currently involved in a site cleanup under a RCRA corrective action. In addition, TVA has commenced a program to evaluate site contamination and remediation beyond that required by regulations. TVA is also involved in several research and development projects involving new remediation technologies.

