

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The top bulb is filled with a dark blue color, and the bottom bulb is filled with a light blue color. The globe is centered in the narrow neck of the hourglass.

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Report 97-312

SUPERFUND FACT BOOK

Mark Reisch and David M. Bearden, Environment and Natural Resources Policy Division

Updated January 27, 1999

Abstract. The Superfund program is the principal federal effort for cleaning up inactive hazardous waste sites and protecting public health and the environment from releases of hazardous substances. This report is a compendium of data and other information about the Comprehensive Environmental Response, Compensation, and Liability act of 1980 (CERCLA) which established the Superfund program, followed by a glossary.

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ABSTRACT

This fact book is a compendium of data and other pertinent information about EPA's Superfund program to clean up the nation's most threatening hazardous waste sites. The topics covered include program funding, number of sites, the National Priorities List, liability, remedies, costs, waste at Superfund sites, settlements, assessments of natural resource damages, land use, public health issues, state Superfund programs, and a glossary of Superfund terms. This product will be updated periodically. (For a current discussion of policy issues and legislation, see CRS Issue Brief IB10011, *Superfund Reauthorization Issues in the 106th Congress*, by Mark Reisch.)

Superfund Fact Book

Summary

The Superfund program is the principal federal effort for cleaning up hazardous waste sites and protecting public health and the environment from releases of hazardous substances. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) established the program, and the Superfund Amendments and Reauthorization Act of 1986 (SARA) amended it. This report is a compendium of data and other pertinent information about CERCLA and the Superfund program, followed by a glossary.

The law's strict, joint and several, and retroactive liability regime requires responsible parties to pay for cleaning up a site. However, CERCLA established the Hazardous Substance Superfund Trust Fund to pay for cleanups where a financially viable party cannot be found. The trust fund has raised about \$1.5 billion per year for cleanup activities, primarily from excise taxes on petroleum and specified chemical feedstocks, and from a corporate environmental income tax, all of which expired on December 31, 1995. The trust fund also pays for the Environmental Protection Agency's (EPA) enforcement, management activities, and research and development. For FY1999, Congress enacted appropriations of \$1.5 billion for the Superfund program (P.L. 105-276).

The National Priorities List (NPL) tracks the sites that most seriously threaten public health and the environment. As of September 29, 1998, the NPL contained a total of 1,260 final and proposed sites, of which 162 were federal facilities and 1,098 were non-federal sites. The Construction Completion List (CCL) catalogs NPL sites where physical construction is complete for all necessary cleanup and removal actions. As of September 29, 1998, there were 535 sites on the CCL. EPA has deleted a total of 176 sites from the NPL because response actions are complete.

In addition to being responsible for cleanup costs, polluters also must pay to restore natural resource damages at Superfund sites. As of July 1996, federal agencies had completed settlements for natural resource damage claims with responsible parties at 67 sites for a total of \$117.6 million. In March 1996, the federal government filed the largest natural resource damage claim to date for a total of \$970 million against several mining companies for contamination in the Coeur d'Alene River Basin in Idaho. Negotiations over the claim are continuing.

The Agency for Toxic Substances and Disease Registry assesses the impact of hazardous substance releases on public health. As of February 1997, the agency had completed 1,776 public health assessments at Superfund sites.

The number of state programs that clean up hazardous waste sites has increased in recent years, and each state has enacted its own enforcement authority. At the end of 1997, the states reported nearly 24,000 potentially hazardous sites warranting attention. All states, except for Nebraska and the District of Columbia, have established their own funds to pay for cleanup activities. The total balance of all state funds at the end of FY1997 was roughly \$1.4 billion, of which states spent about \$565 million for cleanup activities in FY1997.

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Superfund Fact Book

Background

CRS has prepared this fact book to assist Members and Committees of Congress and their staffs in considering Superfund reauthorization legislation. For a current discussion of policy issues and legislation, see CRS Issue Brief IB10011, *Superfund Reauthorization Issues in the 106th Congress*, by Mark Reisch. Other CRS products on Superfund include:

- ! CRS Report 97-731 ENR. *Superfund and the Brownfields Issue*. by Mark Reisch.
- ! CRS Report 98-136 A. *Superfund Act Reauthorization: Liability Issues*. by Robert Meltz.
- ! CRS Report 97-914 ENR. *Superfund Cleanup Standards Reconsidered*. by Mark Reisch and David M. Bearden.
- ! CRS Report 97-953 ENR. *Superfund and States: The State Role and Other Issues*. by Claudia Copeland.
- ! CRS Report 96-774 E. *Taxes to Finance Superfund*. by Salvatore Lazzari.

Legislative History

On December 11, 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to create the Superfund hazardous substance cleanup program.¹ The Superfund Amendments and Reauthorization Act of 1986 (SARA) amended CERCLA to expand the program's scope.² The Omnibus Budget Reconciliation Act of 1990 extended the law's taxing authority to December 31, 1995, which expired at the end of 1991 under SARA.³

Purposes

CERCLA's impetus was the emerging realization that hazardous waste sites presented great risk to public health and the environment in all parts of the nation, that state and local governments did not have the capability to respond, and that

¹ P.L. 96-510, 94 Stat. 2767. CERCLA, as amended, is codified at 42 U.S.C. 9601-9675.

² P.L. 99-499, 100 Stat. 1613.

³ P.L. 101-508, §6301, 104 Stat. 1388-319.

existing federal environmental and disaster relief laws were inadequate. The Love Canal site in Niagara Falls, New York, first brought the issue to national prominence when the state health commissioner declared a state of emergency there on August 2, 1978.

CERCLA's purpose is to authorize the federal government to respond swiftly to hazardous substance emergencies and protect public health and the environment by cleaning up the nation's worst hazardous waste sites. The law seeks to make those responsible for the improper disposal of hazardous waste bear the costs and accept responsibility for their actions, and it also established the Hazardous Substance Superfund Trust Fund to finance response actions where a liable party cannot be found or is incapable of paying cleanup costs.

Superfund Trust Fund

The Hazardous Substance Superfund Trust Fund has traditionally provided most of the funding for the Superfund program. Appropriations from general tax revenues have generally contributed \$250 million annually to the program's operation as well. Excise taxes imposed on the petroleum and chemical industries and an environmental income tax on corporations maintained the Hazardous Substance Superfund Trust Fund through December 31, 1995. Taxing authority for Superfund expired at the end of 1995, and Congress has not enacted legislation to reauthorize the tax. FY1995 was the last full fiscal year in which the Department of the Treasury collected the tax. However, interest and cost recoveries from responsible parties still generate a moderate amount of income for the trust fund each year.

As of the end of FY1998, the unappropriated balance in the Hazardous Substance Superfund Trust Fund was roughly \$2.1 billion. Congress appropriated \$325 million from general tax revenues and nearly \$1.2 billion from the trust fund to support the Superfund program in FY1999, reducing the unappropriated trust fund balance to approximately \$900 million. The total amount of trust fund resources available for appropriation at the beginning of FY2000 will depend how much income is generated from interest and cost recoveries during FY1999.

In FY1995, the Hazardous Substance Superfund Trust Fund was supported by:

- ! a tax on domestically produced and imported oil (about \$576 million);
- ! a tax on feedstock chemicals (about \$291 million);
- ! a corporate environmental income tax (about \$612 million);
- ! and cost recoveries, penalties, and interest on the trust fund.⁴

The Superfund corporate environmental income tax generated a total of \$713.3 million in 1995, the last year that the tax was collected. **Table 1**, on the following page, lists the major industrial sectors that contributed to the tax.

⁴U.S. Department of the Treasury. Financial Management Service. *Hazardous Substance Superfund Trust Fund (20X8145) Income Statement for the Period 10/01/94 Through 09/30/95*. November 3, 1995. 2 p.

Table 1. Superfund Corporate Environmental Income Taxes Paid by Industrial Sectors in 1995

Industrial Sector	\$ Thousands	Percentage
Manufacturing	305,868	42.9
Finance, insurance, and real estate	188,665	26.5
Transportation and public utilities	113,382	15.9
Retail trade	36,791	5.2
Services	31,201	4.4
Wholesale trade	23,418	3.3
Mining	9,595	1.3
Construction	3,255	0.5
Agriculture, forestry, and fishing	1,067	0.1

Table 2 lists selected major industries within the above industrial sectors that contributed to the corporate environmental income tax in 1995.

Table 2. Superfund Corporate Environmental Income Taxes Paid by Selected Major Industries in 1995

Industry	\$ Thousands	Percentage
Manufacturing		
Chemical and allied products	63,107	8.8
Petroleum and coal products	37,743	5.3
Electrical and electronic equipment	36,501	5.1
Machinery, excluding electrical	24,977	3.5
Food and kindred products	24,842	3.5
Paper and allied products	15,891	2.2
Transportation and Public Utilities		
Electric, gas, and sanitary services	54,872	7.7
Communication	43,402	6.1
Finance, Insurance, and Real Estate		
Banking	74,769	10.5
Insurance	67,323	9.4
Credit agencies other than banks	24,232	3.4
Security, commodity brokers, and services	11,705	1.6

Prepared by the Congressional Research Service with data from the U.S. Department of the Treasury. Internal Revenue Service. *Source Book, Statistics of Income, 1995: Corporation Income Tax Returns with Accounting Periods Ended July 1995 - June 1996*. Publication 1053 (Revised March 1998). 536 p. The March 1998 revision of this publication reflects the most recent data on the amount of the tax collected from the major industries.

Appropriations

The Environmental Protection Agency (EPA) administers the Superfund program, and Congress appropriates the program's annual operating budget from the Superfund Trust Fund in the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies appropriations bill. EPA does not have other access to the trust fund. The same appropriations bill also provides monies from the trust fund for the Agency for Toxic Substances and Disease Registry, and for the Superfund-related activities of the Departments of Justice and Interior, the Coast Guard, the National Oceanic and Atmospheric Administration, the Federal Emergency Management Agency, and the Occupational Safety and Health Administration.

- ! Congress authorized a total of \$1.6 billion for Superfund from FY1981 to FY1985, a total of \$8.5 billion from FY1986 to FY1991, and a total of \$5.1 billion from FY1992 to FY1994. Congress has appropriated funding for subsequent years without enacting reauthorizing legislation.
- ! For FY1981, Congress enacted appropriations of \$40.3 million for Superfund, and for FY1999, enacted appropriations of \$1.5 billion. From FY1981 to FY1999, Congress appropriated a total of \$20.9 billion. (Refer to **Table 3** and **Figure 1**.)
- ! For the FY1999 enacted level of \$1.5 billion, approximately 66.7% of the appropriation is allocated for EPA response actions, 12.3% for enforcement, 9.7% for interagency response, 8.7% for program management and support, and 2.7% for research and development. (Refer to **Figure 2**.)
- ! Environmental restoration, of which Superfund spending is a part, is an expanding portion of the federal environmental budget. In addition to Superfund, there are federal facility cleanup and restoration programs at the Departments of Defense, Energy, and the Interior. (Refer to page 9 for a discussion of federal facilities cleanup under the jurisdiction of these agencies.)

Table 3. Superfund Appropriations: FY1981-FY1999
(millions of dollars)

Function	FY1981	FY1982	FY1983	FY1984	FY1985	FY1986
Research/Development	4.7	13.8	6.8	10.2	12.6	10.5
Enforcement	2.5	8.4	17.7	26.7	48.7	52.1
Management/Support	2.3	9.5	11.4	17.2	25.2	30.8
Response Actions	30.8	149.0	184.6	411.2	533.5	312.9
<i>EPA</i>	30.8	149.0	166.2	366.4	510.5	292.7
<i>Interagency</i>	0.0	0.0	18.4	44.8	23.0	20.2
Total Appropriations	40.3	180.7	220.5	465.3	620.0	406.3
Administration Request	250.0	200.0	230.0	310.0	640.0	900.0

Function	FY1987	FY1988	FY1989	FY1990	FY1991	FY1992	FY1993
Research/Development	38.7	58.2	68.1	64.2	72.9	64.7	68.2
Enforcement	100.3	122.9	132.6	121.9	174.9	182.0	175.3
Management/Support	71.2	99.2	102.7	112.5	131.2	124.3	132.8
Response Actions	824.6	847.5	1,121.7	1,262.2	1,250.3	1,262.7	1,224.9
<i>EPA</i>	773.3	763.4	1,027.2	1,149.6	1,116.8	1,114.0	1,072.9
<i>Interagency</i>	51.3	84.1	94.5	112.6	133.5	148.7	152.0
Total Appropriations	1,034.8	1,127.8	1,425.1	1,560.8	1,629.3	1,633.7	1,601.2
Administration Request	1,050.0	1,200.0	1,600.0	1,750.0	1,753.1	1,765.0	1,766.4

Function	FY1994	FY1995	FY1996	FY1997	FY1998	FY1999	Total FY1981 to FY1999
Research/Development	62.6	65.9	5.2	35.0	35.0	40.0	737.3
Enforcement	180.3	177.3	203.2	171.2	183.7	184.0	2,265.7
Management/Support	118.3	130.9	139.2	126.0	130.0	130.0	1,644.7
Response Actions	1,136.0	1,057.1	1,191.6	1,178.0	1,151.3	1,146.0	16,275.9
<i>EPA</i>	976.9	888.5	1,073.6	1,032.0	1,009.5	1,000.0	14,513.3
<i>Interagency</i>	159.1	168.6	118.0	146.0	141.8	146.0	1,762.6
Total Appropriations	1,497.2	1,431.2	1,539.2	1,510.2	1,500.0	1,500.0	20,923.6
Administration Request	1,614.7	1,499.7	1,562.9	1,394.2	2,216.9	2,092.7	23,795.6

Prepared by the Congressional Research Service with data from Environmental Protection Agency budget justification documents.

Figure 1. Superfund Appropriations: FY1981 to FY1999

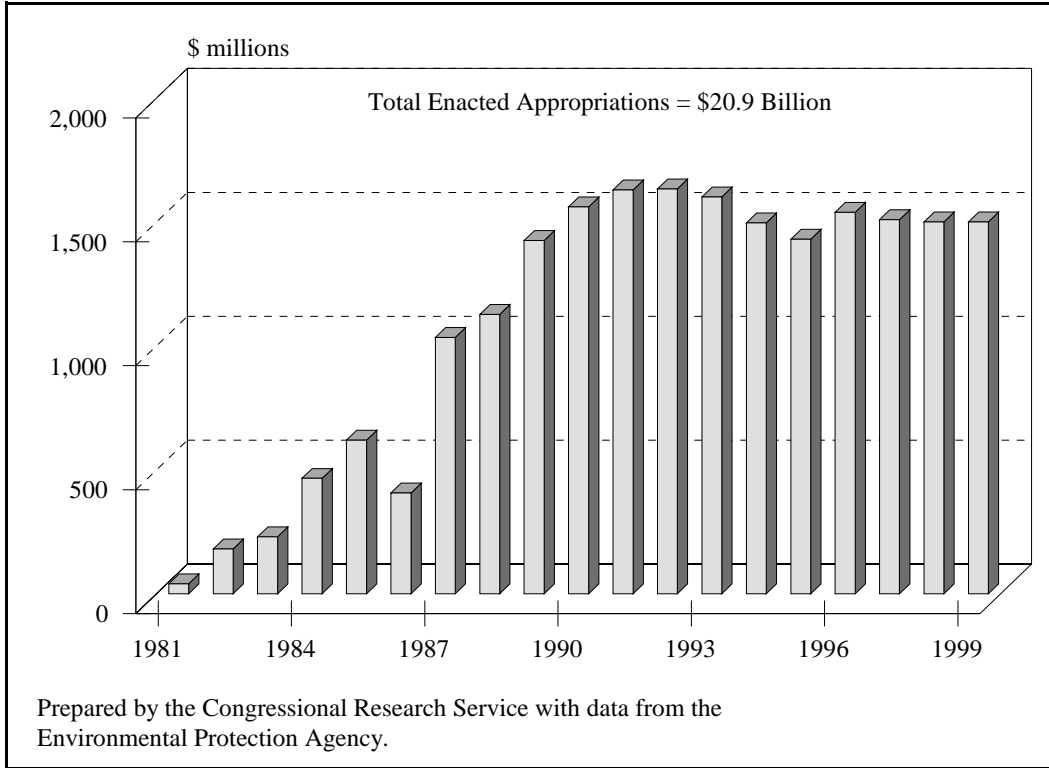
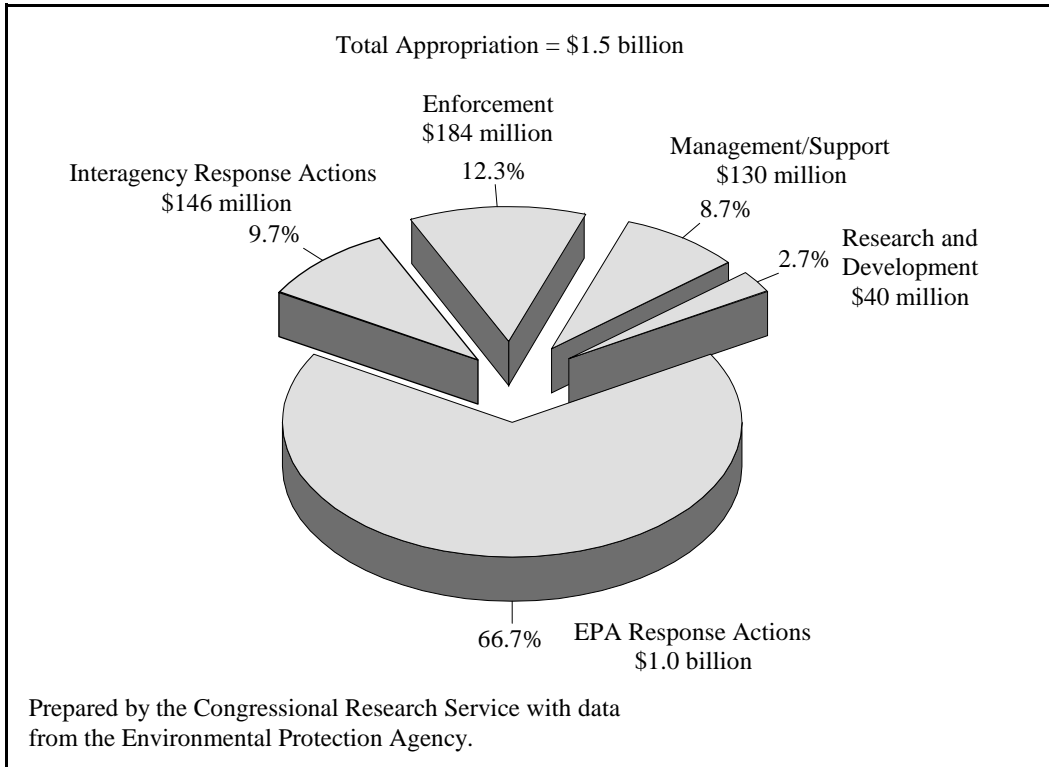


Figure 2. FY1999 Superfund Appropriation



Number of Sites

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) tracks sites that are brought to EPA's attention that may warrant cleanup. A site's presence on CERCLIS does not determine a party's liability for cleanup and does not indicate that cleanup is required. However, listing a site on CERCLIS reportedly at times has carried a stigma by association with the Superfund program, which has interfered with the sale or development of properties.

EPA had not removed any sites from CERCLIS until March 29, 1995, when roughly 40,000 sites were listed. At that time, as part of EPA's brownfields agenda, it began archiving sites it designated as *No Further Response Action Planned* (NFRAP). As of December 2, 1998, there were a total of 10,411 sites listed in CERCLIS, and a total of 31,463 sites had been transferred to the archived listing.

National Priorities List

CERCLA requires the National Oil and Hazardous Substances Contingency Plan to include a National Priorities List (NPL) of sites that pose the highest potential threat to human health and the environment in the United States. CERCLA requires EPA to revise the NPL at least annually. The NPL identifies sites that warrant further evaluation but does not assign liability for a release of hazardous substances.

! There are three mechanisms for placing a site on the NPL:

- 1) The Hazard Ranking System (HRS) evaluates the potential threat of a contaminated site to human health and the environment. Sites scoring higher than 28.5 on the HRS scale are eligible for the NPL.
- 2) Regardless of a site's HRS score, a state may designate a site as its highest priority for cleanup, making it eligible for the NPL.
- 3) A site can be placed on the NPL regardless of its HRS score if the Agency for Toxic Substances and Disease Registry has issued a health advisory for a site, EPA determines a site to pose a significant threat to public health, or EPA expects that using long-term remedial authority will be more cost-effective than short-term removal authority to clean up a site.

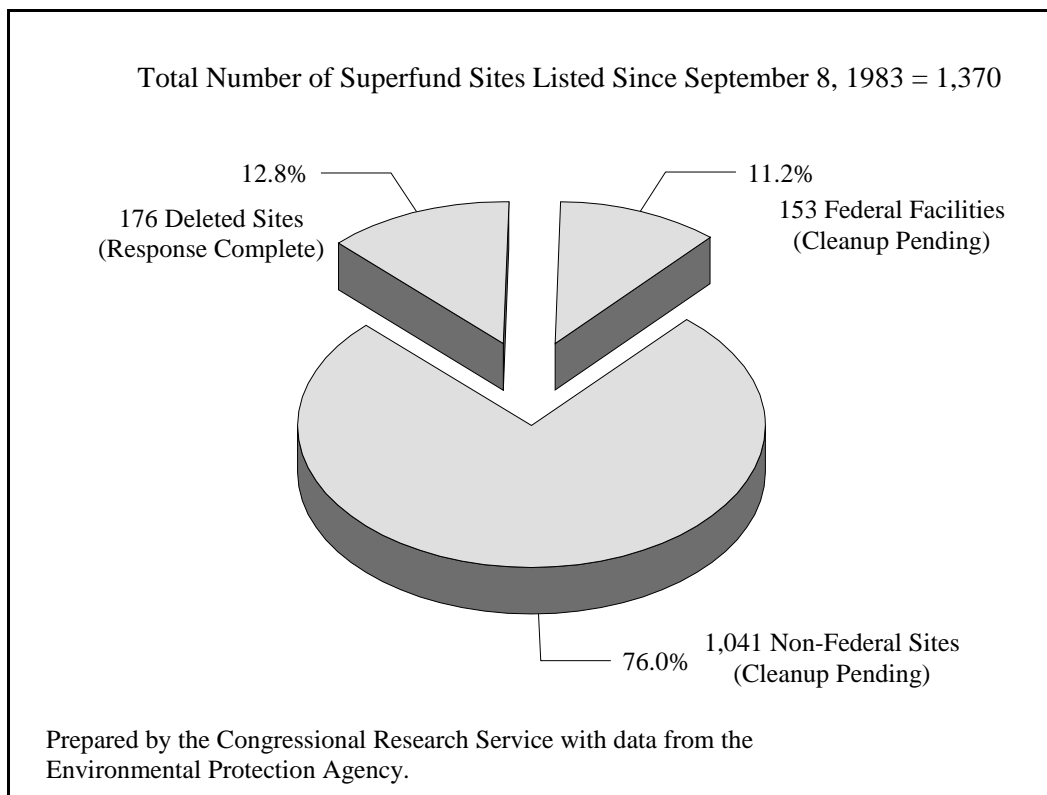
! The NPL includes two sections. EPA has the authority to evaluate and clean up non-federal sites listed in the *general* section, and other federal agencies with sites in their jurisdictions have the authority to evaluate and clean up sites listed in the *federal facilities* section. EPA is not the lead agency for federal facilities but is responsible for preparing the HRS scores for these sites.

! As of September 29, 1998, there were 1,194 sites on the NPL, of which 153 were federal facilities and 1,041 were non-federal sites. EPA also proposed to add 66 sites to the NPL, of which 9 were federal facilities and 56 were non-

federal sites. Final and proposed NPL sites totaled 1,260, of which 162 were federal facilities and 1,098 were non-federal sites.⁵

- ! The first listing in the *Federal Register* occurred on September 8, 1983, and placed 406 sites on the NPL.⁶ Since the beginning of the Superfund program, EPA has placed a total of 1,370 sites on the NPL. (Refer to **Figure 3.**)
- ! In 1994, GAO estimated that between 2,500 and 2,800 non-federal sites could be added to the NPL from the inventory of CERCLIS sites under assessment or awaiting evaluation, while EPA estimated that 1,700 sites could be added through 2020. GAO also reported that the Congressional Budget Office (CBO) projected a total of 3,300 sites could be added to the NPL by 2027.⁷
- ! A 1992 study indicated that 403 NPL sites involved local governments, either as site owners, or as operators or transporters of waste to a site. The study categorized 216 of these sites as landfills.⁸

Figure 3. Status of the National Priorities List as of September 29, 1998



⁵EPA. *Federal Register*. September 29, 1998. p. 51848-51853.

⁶EPA. *Federal Register*. September 8, 1983. p. 40658-40682.

⁷GAO. *Superfund: Estimates of Number of Future Sites May Vary*. GAO/RCED-95-18. December 1994. p. 2.

⁸Clean Sites, Inc. *Main Street Meets Superfund: Local Government Involvement at Superfund Hazardous Waste Sites*. January 1992. p. 16.

Construction Completions and Deletions

Construction completion at a site refers to the point in the cleanup process at which physical construction is complete for all remedial and removal work anticipated at the entire site. EPA places an NPL site on the Construction Completion List (CCL) under one of three circumstances: 1) necessary physical construction is complete; 2) response action does not involve construction (e.g., institutional controls); or 3) the site qualifies for deletion from the NPL.

- ! As of September 29, 1998, there were a total of 535 sites on the CCL. EPA has deleted 176 of these sites from the NPL because response actions are complete. Cleanup is pending at the remaining 359 sites on the NPL where construction is complete.⁹
- ! In November 1995, EPA initiated a new policy as part of its second round of administrative reforms to encourage economic redevelopment of sites. Under this policy, portions of a site where cleanup is complete can be deleted from the NPL and returned to productive use while cleanup on the rest of the site continues. As of September 29, 1998, EPA had deleted portions of 11 NPL sites.¹⁰
- ! GAO reports that EPA expects to complete construction for all necessary remedial and removal work at a total of 650 sites by the end of the year 2000, assuming level funding.¹¹ However, in 1994, a survey of site managers projected a total of 965 construction completions during this same period.¹²

Federal Facilities

Federal agencies are responsible for cleaning up hazardous releases at sites on their facilities. EPA maintains the Federal Facilities Docket to track facilities that federal agencies have reported as warranting evaluation. Once a facility is placed on the docket, the responsible agency must assess the site within 6 months to characterize the contamination. If this assessment indicates potentially hazardous levels of contamination, EPA evaluates the facility using the HRS to determine whether to list the facility on the NPL. The responsible federal agency must develop and implement a plan to clean up its facilities on the NPL and fund the remediation. EPA oversees the development of the remedial plan and the cleanup activities.¹³

⁹EPA. *Federal Register*. September 29, 1998. p. 51850.

¹⁰Ibid.

¹¹GAO. *Superfund: Times to Complete Site Listing and Cleanup*. February 4, 1998. GAO/T-RCED-98-74. p. 3.

¹² EPA. Office of Solid Waste and Emergency Response (OSWER). *Survey of NPL Site Managers*. January 28, 1994. EPA conducted this survey in response to 21 questions submitted by Representatives Al Swift and John Dingell on July 19, 1993.

¹³ 42 U.S.C. 9620. "Federal Facilities."

- ! As of November 23, 1998, there were 2,182 facilities on the Federal Facilities Docket.¹⁴ Each facility typically has multiple sites that warrant evaluation. As of September 29, 1998, EPA had placed 153 of the most potentially hazardous federal facilities on the NPL.¹⁵
- ! The Departments of Defense (DOD) and the Department of Energy (DOE) have the largest budgets for cleaning up federal facilities.¹⁶ The Department of the Interior has fewer sites that require major response actions, and its cleanup budget is relatively small compared to DOD and DOE.
- ! In 1996, the Federal Facilities Policy Group, an interagency committee, estimated that the total future costs to complete cleanup actions at federal facilities under the jurisdictions of the Departments of Defense, Energy, and Interior could be between \$235 and \$389 billion. Of this total estimated cost, Defense's share would be \$31 billion, Energy's would be between \$200 and \$350 billion, and Interior's would be between \$4 and \$8 billion.¹⁷

Number of Superfund Sites by State or Territory

Over the history of the Superfund program, every state and territory has had at least one site listed on the NPL at some point in time. As of September 29, 1998, there were a total of 1,260 final and proposed sites on the NPL. New Jersey had a total of 111 final and proposed sites on the NPL, more than any other state. North Dakota was the only state that did not have any sites on the NPL or proposed for listing as of September 29, 1998. **Table 4**, on the following page, lists the number of final and proposed NPL sites located within each state and U.S. territory. For information on a specific site, refer to EPA's Superfund home page on the Internet at <http://www.epa.gov/superfund> or contact the Superfund Hotline at 703-412-9810 in the Washington, D.C. metropolitan area or toll free at 1-800-424-9346 outside of the Washington area.

¹⁴ EPA. *Federal Register*. November 23, 1998. p. 64806-64818.

¹⁵ EPA. *Federal Register*. September 29, 1998. p. 51850.

¹⁶ For background and funding information on DOD and DOE's cleanup programs, refer to CRS Report 97-790 ENR, *Environmental Protection: Defense-related Programs*, by David M. Bearden.

¹⁷ GAO. *Federal Facilities: Consistent Relative Risk Evaluations Needed for Prioritizing Cleanups*. GAO/RCED-96-150. June 1996. p. 29.

Table 4. Number of Final and Proposed Superfund Sites by State as of September 29, 1998

State or Territory	Non-Federal Sites	Federal Sites	Total Sites
New Jersey	105	6	111
Pennsylvania	94	6	100
California	73	23	96
New York	80	4	84
Michigan	70	1	71
Florida	47	6	53
Washington	33	14	47
Illinois	39	4	43
Wisconsin	40	0	40
Ohio	32	5	37
Texas	28	4	32
Massachusetts	23	8	31
Indiana	30	0	30
Minnesota	25	2	27
Virginia	18	9	27
South Carolina	23	2	25
North Carolina	22	2	24
Missouri	19	3	22
New Hampshire	17	1	18
Maryland	10	8	18
Colorado	14	3	17
Iowa	16	1	17
Delaware	16	1	17
Georgia	14	2	16
Utah	12	4	16
Kentucky	15	1	16
Louisiana	14	1	15
Tennessee	11	4	15
Connecticut	13	1	14

State or Territory	Non-Federal Sites	Federal Sites	Total Sites
Oklahoma	11	1	12
Rhode Island	10	2	12
Alabama	9	3	12
Maine	9	3	12
New Mexico	10	1	11
Oregon	9	2	11
Arkansas	11	0	11
Kansas	9	2	11
Arizona	7	3	10
Puerto Rico	9	1	10
Nebraska	9	1	10
Montana	9	0	9
Vermont	9	0	9
Idaho	7	2	9
Alaska	1	6	7
West Virginia	5	2	7
Hawaii	1	3	4
Mississippi	3	0	3
Wyoming	2	1	3
Guam	1	1	2
South Dakota	1	1	2
Virgin Islands	2	0	2
District of Columbia	0	1	1
Nevada	1	0	1
North Dakota	0	0	0
Grand Total	1,098	162	1,260

Prepared by the Congressional Research Service with data from the Environmental Protection Agency.

Administrative Reforms

To increase the pace of remediation, reduce cleanup costs, and improve program efficiency, EPA has conducted three rounds of Superfund reforms that consist of various initiatives and pilots implemented within the existing statutory framework under CERCLA.

- ! In June 1993, EPA introduced the first round of reforms to increase the pace of site investigation and construction completion activities.
- ! In February 1995, EPA introduced the second round of reforms to address concerns over enforcement, economic redevelopment of sites, community involvement and outreach, environmental justice, consistent program implementation, and state empowerment.
- ! In October 1995, EPA introduced the third and final round of reforms consisting of 20 initiatives designed to make cost-effective cleanup choices that protect public health and the environment, reduce the volume of litigation and the amount of legal expenses, and ensure that states and communities are more informed and involved in cleanup decisions.

EPA reports that the implementation of its reforms through the end of FY1997 has accomplished the following:

- ! reviewed and updated selected remedies at specific sites during 1996 and 1997 estimated to yield future cost savings of over \$900 million in public and private remediation expenses;
- ! more than doubled the pace of construction completions over 5 years from 217 in FY1993 to 498 in FY1997;
- ! removed over 15,000 small volume waste contributors from the liability system;
- ! evaluated and archived over 30,000 sites from CERCLIS; and
- ! negotiated settlements with responsible parties to perform or fund roughly 70% of cleanups, representing more than \$12 billion in remediation costs.¹⁸

Liability

A **Potentially Responsible Party (PRP)** is any individual or company that may have contributed to contamination at a Superfund site. Examples of PRPs include waste generators, waste transporters, current or former landowners, and site

¹⁸EPA. Office of Emergency and Remedial Response (OERR). *Superfund Reforms FY1997 Annual Report*. p. 2-4.

operators. Courts have interpreted liability provisions for Superfund remediations under CERCLA to be strict, joint and several, and retroactive.

- ! **Strict liability** means the government needs to prove only involvement at a waste site, not negligence. Under CERCLA, proof of strict causation is not necessary.
- ! **Joint and several liability** indicates that any involved party can have the legal responsibility for cleaning up the entire site, regardless of its degree of involvement, unless there is a reasonable basis for apportioning liability.
- ! **Retroactive liability** means that parties can be held liable for releases resulting from actions prior to when Congress enacted CERCLA in 1980.
- ! The Asset Conservation, Lender Liability, and Deposit Insurance Protection Act of 1996, P.L. 104-208, addressed lender liability. It protects lenders and fiduciaries from CERCLA liability as long as they do not participate in the management of a facility contaminated with hazardous substances. Lenders at times have incurred liability after foreclosing on a contaminated property. This law describes what actions a lender may take, which include activities related to its financial interest, and appropriate response to a hazardous substance release.

Remedies

CERCLA requires the lead agency for a site to select remedial actions that protect human health and the environment, are cost-effective, and utilize permanent solutions, alternative technologies, or resource recovery technologies to the maximum extent practicable. To evaluate the cost-effectiveness of a remedy, the lead agency must consider the total short-term and long-term costs, including the costs of operation and maintenance.¹⁹

ARARs

CERCLA does not contain any cleanup standards but instead requires the lead and support agencies for a site to select remedy standards that comply with other existing federal environmental laws and regulations. CERCLA requires that the lead and support agencies use "applicable or relevant and appropriate requirements" (ARARs) to select these standards.²⁰

¹⁹ 42 U.S.C. 9621. "Cleanup Standards."

²⁰ 42 U.S.C. 9621(d). "Degree of Cleanup."

- ! **Applicable requirements** are federal or state cleanup standards that apply to a specific hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a site.²¹
- ! **Relevant and appropriate requirements** are cleanup standards that are not specifically legally applicable to the site, but do address problems or situations sufficiently similar to the circumstances of the release or to the contemplated remedial action, that they can be considered both relevant and appropriate to use at the site.²²
- ! In addition to ARARs, the lead and support agencies for a site may identify federal or state advisories, criteria, or guidance to be considered for a specific release that may be useful in developing remedies.²³
- ! The lead and support agencies for a site apply state standards to a remedy only if they are more stringent than federal requirements, legally enforceable, and brought to EPA's attention by the state in a timely manner.²⁴

Remedy Selection

- ! **Treatment** means a process that significantly reduces the volume, toxicity, or mobility of hazardous substances. **Containment** is a remediation method that seals off all possible exposure pathways between a hazardous disposal site and the environment, which generally includes capping and institutional controls. **Removal, or emergency removal**, is an action taken by EPA under the emergency removal provisions of CERCLA, which enables the agency to take preliminary steps to clean up a site or reduce its danger when there is an imminent and substantial threat to public health or the environment. An emergency removal cannot exceed \$2 million or one year for any one action at any one site.
- ! The most recent data on the types of remedies selected were compiled in 1991. At that time, EPA selected treatment as the remedy for 78% of sites with ground water contamination, and 65% with surface water contamination. When soil contamination occurred, EPA selected treatment at 50% of sites. EPA tends to select containment remedies for large volumes of waste at sites (for example, greater than one million cubic yards), and treatment remedies for small volumes of waste (less than 1,000 cubic yards).²⁵

²¹ 40 CFR 300.400(g)(1). "Identification of applicable or relevant and appropriate requirements."

²² 40 CFR 300.400(g)(2).

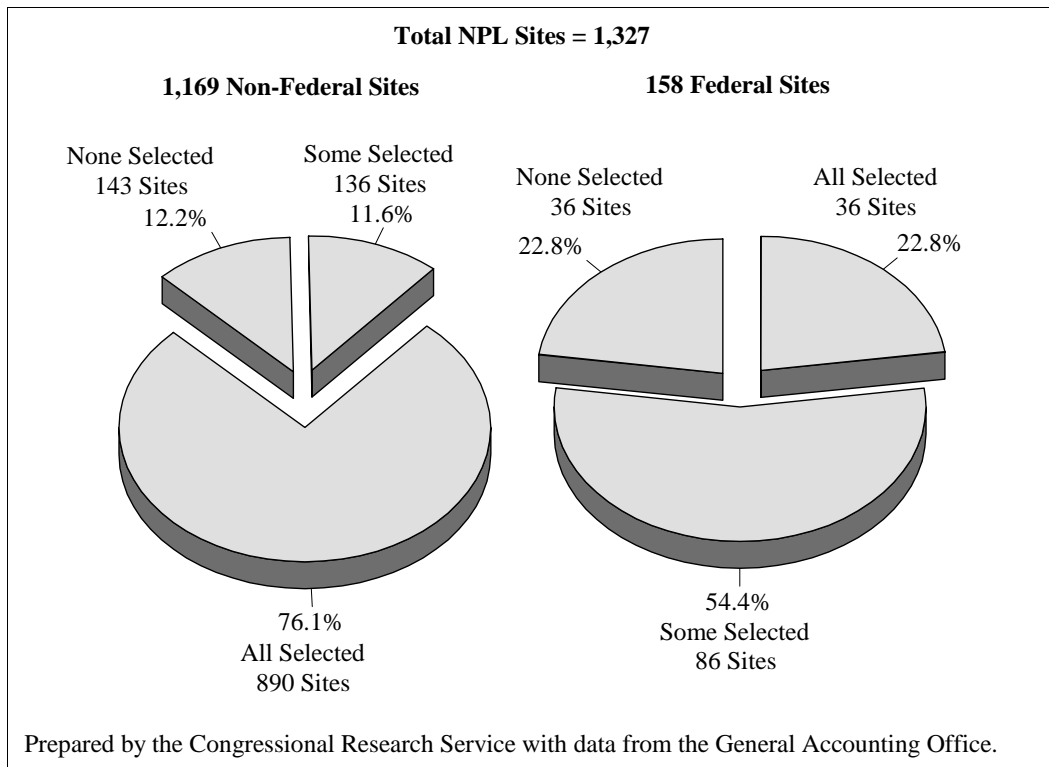
²³ 40 CFR 300.400(g)(3).

²⁴ 40 CFR 300.400(g)(4).

²⁵ EPA. OERR. 1991.

- ! The emergency removal program responds to short-term emergencies at hazardous waste disposal sites requiring immediate action. As of the end of FY1998, approximately 5,500 emergency removal actions had been taken to immediately reduce the threat to public health and the environment.²⁶
- ! As of the end of FY1997, a total of 1,327 sites had been placed on the NPL. GAO reports that EPA had completed the process of selecting remedies at 926 (70%) of these sites. EPA also had selected at least one remedy at another 222 (17%) sites. However, 133 (60%) of the sites with just one remedy selected needed only one additional remedy to be chosen before cleanup could begin. As of the end of FY1997, EPA had still not selected any remedies at the remaining 179 (13%) sites listed on the NPL at that time.²⁷
- ! GAO reports that the selection of remedies has been much slower at federal facilities. By the end of FY1997, EPA had completed remedy selection at 36 (23%) of the 158 federal facilities on the NPL compared to 890 (76%) of the 1,169 non-federal sites. EPA attributed the slower progress at federal facilities to more complex problems with contamination and the fact that federal facilities were added to the NPL later than many of the non-federal sites.²⁸

Figure 4. Status of Remedy Selection at NPL Sites at the End of FY1997



²⁶EPA. OERR. *Superfund Facts: The Program at Work*. September 1998.

²⁷GAO. *Superfund: Information on the Status of Sites*. GAO/RCED-98-241. August 1998. p. 4.

²⁸Ibid.

Length of Time to Remediation

- ! GAO reports that the average time to place a site on the NPL and complete cleanup generally has increased over the life of the Superfund Program.²⁹
- ! From 1986 to 1990, EPA took an average of 5.8 years from the time of site discovery to investigate and process the non-federal sites that it added to the NPL. By 1996, the average time to list a site on the NPL from the time of discovery had increased to 9.4 years. GAO attributed increases in the time required to place a site on the NPL to the backlog of sites awaiting processing once investigation was complete.
- ! From 1986 to 1989, cleanup required an average of 3.9 years from the time that EPA placed a site on the NPL. By 1996, the time required for cleanup had more than doubled to an average of 10.6 years. EPA attributed increasing cleanup times to the growing complexity of sites, lengthier negotiations to reach settlements with PRPs, and resource constraints. GAO estimated that in future years the average time required to clean up sites listed on the NPL as of July 1, 1997, could exceed 8 years.

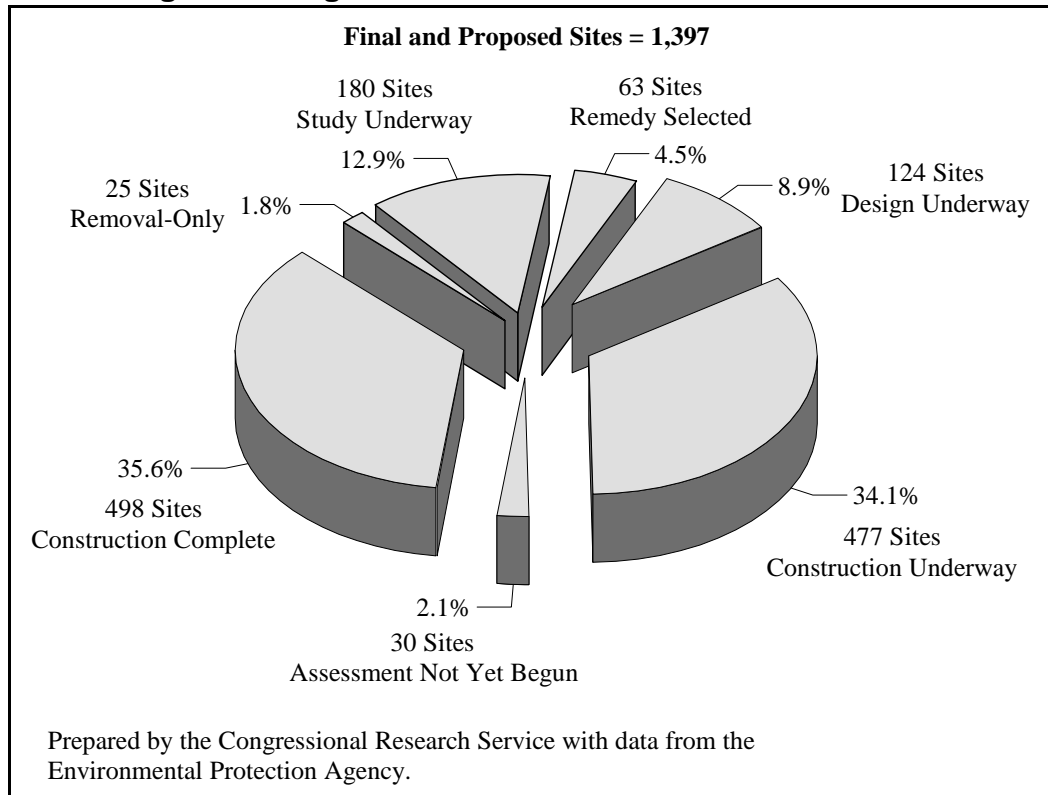
Stages of Remediation

At the end of FY1997, the status of the 1,397 Superfund sites (including final and proposed sites) was:

- ! 30 sites with remedial assessment not yet begun;
- ! 25 sites with removal-only actions;
- ! 180 sites where studies were underway;
- ! 63 sites where remedies had been selected;
- ! 124 sites where remedy designs were underway;
- ! 477 sites where construction was underway; and
- ! 498 sites where construction was complete for all necessary remedial and removal actions.³⁰ (535 sites as of September 29, 1998.) Refer to **Figure 5** on the following page.

²⁹GAO. *Superfund: Times to Complete Site Listing and Cleanup*. GAO/T-RCED-98-74. February 4, 1998. p. 1-2.

³⁰EPA. OERR. *Superfund Reforms FY1997 Annual Report*. p. 2.

Figure 5. Stages of Remediation at the End of FY1997

Costs

- ! A CBO study released in January 1994 estimated that it could take \$75 billion to clean up a total of 4,500 sites now in need of work (including current NPL sites, and ones to be added in the future).³¹
- ! The Joint Institute for Energy & Environment (JIEE) estimated that cleanup costs could be reduced by about 35% through increased use of institutional controls and containment remedies (in place of destruction and isolation technologies), while essentially protecting human health and the environment at the same levels of safety.³²

³¹ U.S. Congress. Congressional Budget Office. *The Total Costs of Cleaning Up Non-federal Superfund Sites*. 1994.

³² Milton Russell and Kimberly L Davis. *Resource Requirements for NPL Sites: Phase II Interim Report*. Knoxville, JIEE, September 1995. 60 p.

JIEE is a research consortium of Oak Ridge National Laboratory, the Tennessee Valley Authority, and the University of Tennessee. The authors "suggest that [these] study results should supersede" those of the earlier studies in which they participated: M. Russell, E.W. Colglazier, and M.R. English, *Hazardous Waste Remediation: The Task Ahead*; and E.W. Colglazier, T. Cox, and K. Davis, *Estimating Resource Requirements for NPL Sites*. Knoxville, University of Tennessee, Waste Management Research and Education Institute, (continued...)

- ! The JIEE estimated total cleanup costs under this less stringent scenario to be \$34.1 billion for an NPL of 1,350 sites; \$53.0 billion if there were 2,100 sites; and \$75.7 billion for 3,000 sites.³³
- ! EPA last projected total funding requirements for the Superfund program in its annual report to Congress for FY1994, which estimated total funding requirements of \$17.4 billion from FY1995 through future fiscal years, and a future cumulative total of \$31.0 billion in funding requirements since the program's beginning in FY1981. (Thus far, Congress has appropriated a total of \$20.9 billion from FY1981 to FY1999. Refer to **Table 3** and **Figure 1** on pages 5 and 6 respectively.) EPA based its estimates of future funding requirements on the 1,290 final and proposed sites on the NPL as of the end of FY1994.³⁴

Capital Costs

- ! A 1994 survey of NPL site managers indicated that the average capital cost at a non-federal site was \$21.8 million. Site assessment, studies, and design comprised 11% of total site costs, resulting in an average cost of \$25 million.³⁵
- ! A relatively small number of very expensive sites raised the average cost significantly. Over 60% of all capital cleanup costs were accounted for by only 16% of the operable units (OUs). An operable unit is a division of a site cleanup project; on average, there were 1.8 OUs at each non-federal site.³⁶
- ! 69% of Superfund sites had capital costs of less than \$10 million.³⁷
- ! 38% had capital costs of less than \$3 million.³⁸
- ! Site managers expected capital costs to exceed \$20 million at 296 sites (232 non-federal sites and 64 federal facilities). The most common factors contributing to these estimates were large volumes of contaminated media, site complexities, and high treatment costs.³⁹

³²(...continued)
1991.

³³ Ibid., p. 39.

³⁴EPA. OERR. *Progress Toward Implementing Superfund: FY1994 Report to Congress*. EPA Publication #9200.2-24.

³⁵ EPA. OSWER. Survey of NPL Site Managers. January 28, 1994.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

EPA Enforcement and Costs to (PRPs)

- ! The Superfund program enforcement budget for FY1999 is \$184 million, or approximately 12.3% of the total Superfund appropriation of \$1.5 billion.
- ! Responsible parties are paying for an increasing share of total cleanup costs. In FY1987, the share of cleanup costs for responsible parties was 37%, and the trust fund's share was 63%.⁴⁰ However, by the end of FY1997, the share of cleanup costs for responsible parties had increased to 70%.⁴¹
- ! In FY1997, responsible parties agreed to pay \$451.5 million for future response work and \$158 million for past cost recoveries for a total of \$609.5 million in cleanup costs. At the end of FY1997, the cumulative value of cleanup activities that responsible parties have committed to since the beginning of the Superfund program exceeded \$14.7 billion.⁴²
- ! In FY1997, EPA settled 197 new claims for cost recoveries from responsible parties with a total value of \$158 million and collected a total of \$316 million in past costs from responsible parties as a result of prior year settlements. From the beginning of the Superfund program to the end of FY1997, EPA had negotiated settlements with responsible parties for a cumulative value of \$2.3 billion in costs to recover past cleanup expenses. Of this amount, EPA has collected roughly \$1.7 billion in cost recoveries from responsible parties.⁴³

Transaction Costs

Transaction costs are a PRP's expenses for activities other than remediation. Transaction costs include legal expenses to negotiate cleanup liability and settlement with EPA, collect insurance claims for cleanup costs, and litigate with other parties that may have contributed to a release. Transaction costs also may include other expenses, such as laboratory testing for contamination in soil samples.

- ! In 1994, GAO conducted a survey of 1,000 major U.S. corporations. Of these corporations, 367 had been a PRP at a Superfund site and had incurred legal expenses during the cleanup process. Of these 367 corporations, 81 spent \$100,000 or less on cleanup costs, and 38 spent over \$20 million. The average total cleanup cost for an individual corporation was \$1.5 million, of which each corporation spent an average of \$500,000 on legal expenses.⁴⁴

⁴⁰EPA. OSWER. *Superfund Enforcement Program Highlights*. 1993.

⁴¹EPA. OERR. *Superfund Reforms FY1997 Annual Report*. p 2.

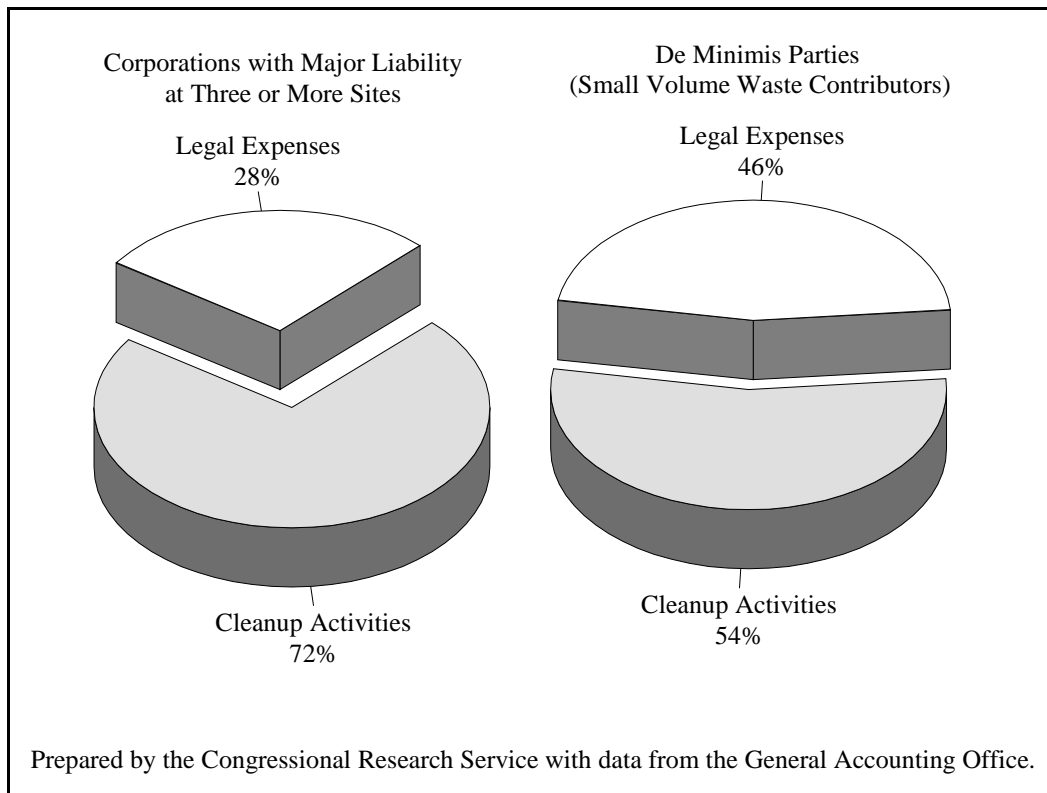
⁴²EPA. Office of Enforcement and Compliance Assurance (OECA). *FY1997 Enforcement and Compliance Assurance Accomplishments Report*. July 1998. p. 2-6.

⁴³Ibid.

⁴⁴GAO. *Superfund: Legal Expenses for Cleanup-Related Activities of Major U.S. Corporations*. GAO/RCED-95-46. December 1994. p. 4.

- ! Corporations with a major share of liability at 3 or more sites incurred an average of \$3.5 million in legal expenses for each site, 28% of their total cleanup cost. *De minimis* parties (small volume waste contributors) incurred an average of \$32,000 in legal expenses for each site, 46% of their total cleanup cost. While *De minimis* parties incurred the least amount of total cleanup expenses, their legal expenses as a percentage of their total cleanup costs were the highest.⁴⁵ (Refer to **Figure 6**.)
- ! The surveyed corporations identified 3 factors that could contribute to lowering legal expenses: 1) complete identification of all PRPs; 2) effective enforcement of each PRP's liability; and 3) accurate volumetric data on each PRP's contribution to a release.
- ! About 52% of the surveyed corporations stated that joining a PRP group helped to lower legal expenses by encouraging cooperation among the parties and avoiding litigation.⁴⁶

Figure 6. Legal Expenses as a Share of Total Costs at Superfund Sites



⁴⁵ Ibid., p. 5-6.

⁴⁶ Ibid., p. 11-12.

Insurers

- ! As of 1990, insurers and those who were insured spent approximately \$500 million each year on Superfund litigation involving insurance coverage.⁴⁷
- ! Insurance companies are experiencing substantial increases in their payments for PRP Superfund claims. A GAO study of the nation's largest property/casualty insurers found that, before 1987, 10 of 13 studied companies made a total of approximately \$11 million in payments to their policy holders. From 1987 to 1991, however, the 13 companies paid approximately \$144 million in claims.⁴⁸
- ! According to a RAND study of four national insurance carriers involving over 13,000 claims, 88% of total expenditures by insurance companies to PRP policyholders covered transaction costs such as corporate legal fees, and 12% of payments were for corporate remedial activities. RAND calculated that if its sample were representative of the whole insurance industry, insurers spent \$470 million on claims involving inactive hazardous waste sites in 1989.⁴⁹

Operation and Maintenance Costs

After constructing remedies to clean up a site, additional activities may be necessary to ensure that the remedy continues to function effectively to protect human health and the environment. These activities commonly include maintaining landfill covers, treating contaminated ground water, or restricting the use of land or water adjacent to a site. Operation and maintenance (O&M) costs are the expenses to perform these activities.

- ! States are responsible for assuring the effective operation and maintenance of remedial constructions or other controls, and PRPs are financially responsible for their share of O&M costs at a site. However, if the site remediation is being paid for by the Superfund program (is "Fund-financed"), and the remedy involves restoring ground or surface water to safe levels, EPA is responsible for the cost of the first 10 years of the remedy, after which it becomes the state's responsibility. The pertinent federal agency is responsible for O&M costs at federal facilities.⁵⁰
- ! As of May 1995, there were 275 Superfund sites where remedial constructions were complete. Of these sites, 173 required long-term O&M, and the

⁴⁷ House Committee on Banking, Finance and Urban Affairs, 1990, as referenced in Business Roundtable, *101 Terms & Facts on Superfund*, November 1993.

⁴⁸ GAO. *Superfund Pollution Claims*. 1992.

⁴⁹ Acton, Jan Paul, and Lloyd S. Dixon. *Understanding Superfund*. RAND Institute for Social Justice. 1989.

⁵⁰ 40 CFR 300.435(f). "Operation and Maintenance."

remaining 102 used remedies that did not require it (for example, successfully treating surface waste).⁵¹

- ! Restoring contaminated ground or surface water to safe levels represented the largest portion of O&M costs, about 47%. Remedies that only include containing surface waste represented the smallest portion, about 12%. Maintaining both remedies accounted for 36%, and maintaining other remedies accounted for the remaining 5% of O&M costs.⁵² (Refer to **Figure 7** on the following page.)
- ! EPA estimated that the average duration for O&M to completely clean up or maintain a site would be 30 years, and GAO estimated that the average O&M costs per site would be \$12 million during this period. However, these costs could be greater if the duration exceeds 30 years. A survey of EPA's regional project managers indicated that about 20% of Superfund sites would require O&M for more than 30 years. For example, sites where the remedy is containing waste would require O&M indefinitely to maintain and periodically repair the waste cover.⁵³
- ! In FY1994, O&M costs at Superfund sites totaled \$148 million, but these costs likely will increase substantially in the future as remedial constructions are completed over the next decade. GAO estimated that annual O&M costs would approach \$1 billion by FY2010.⁵⁴
- ! GAO estimated that O&M costs for current and future sites would total almost \$32 billion through FY2040. Of this estimate, the federal government would be responsible for approximately \$5 billion, the states for \$8 billion, and the responsible parties for \$18 billion. EPA estimated a higher amount of \$37 billion for O&M costs through FY2040.⁵⁵

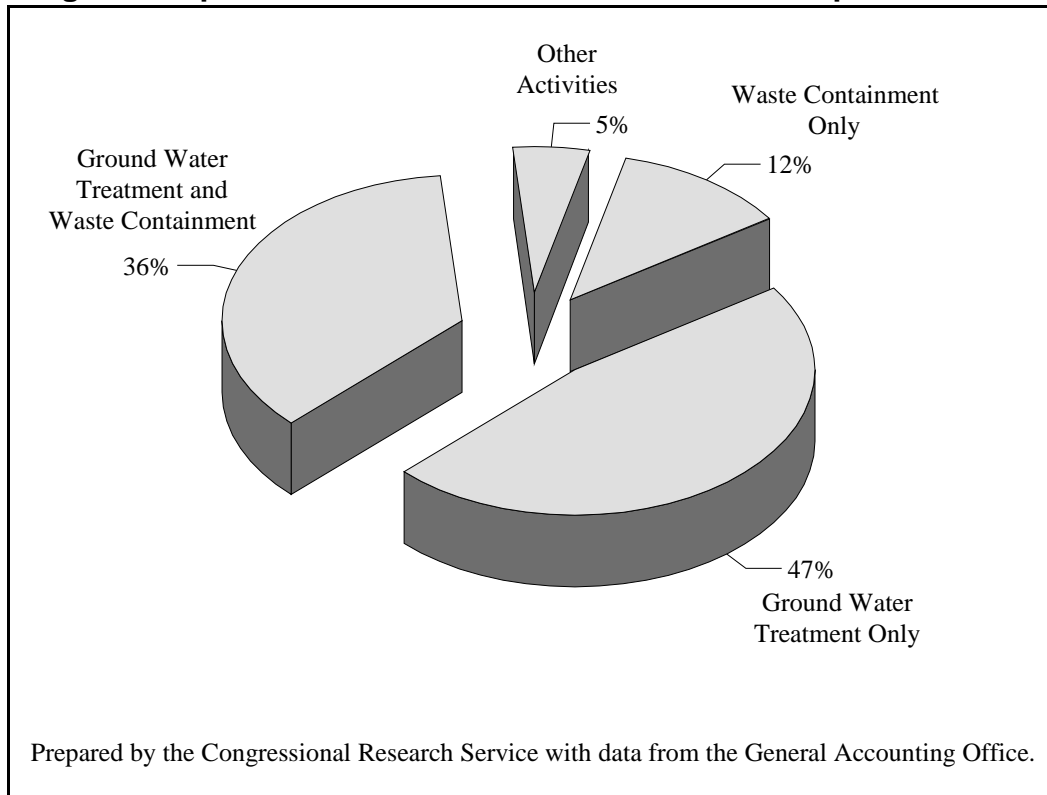
⁵¹ GAO. *Superfund: Operations and Maintenance Activities Will Require Billions of Dollars*. GAO/RCED 95-275. September 1995. p. 4.

⁵² *Ibid.*, p. 9.

⁵³ *Ibid.*, p. 8.

⁵⁴ *Ibid.*, p. 6.

⁵⁵ *Ibid.*, p. 4-9.

Figure 7. Operation and Maintenance Activities at Superfund Sites

Waste at Superfund Sites

The Record of Decision (ROD) is a formal document by which an EPA administrator (usually the Regional Administrator) chooses the remedy for cleaning up a specific type of contamination at a Superfund site. EPA's Superfund home page on the internet at <http://www.epa.gov/superfund> provides information on RODs for specific Superfund sites.

- ! As of 1992, soil contamination occurred at 80% of the Superfund sites with RODs yet to be implemented.⁵⁶
- ! In 1993, EPA estimated that ground water contamination occurred at nearly 79% of Superfund sites with RODs.⁵⁷
- ! A variety of sources contribute waste to Superfund sites, which can lead to soil or ground water contamination. A 1992 study indicated that manufacturing operations contribute the largest share of the waste, while

⁵⁶ EPA, Technology Innovation Office, 1992, as referenced in Business Roundtable, *101 Terms & Facts on Superfund*. November 1993.

⁵⁷ Kovalick, Walter, Jr. EPA. OSWER. Testimony before the U.S. House Committee on Science, Space and Technology. April 1993.

mining activities contribute the smallest portion. **Table 5** indicates the most common sources of waste at Superfund sites and the percentage share of the total waste for each source.

Table 5. Common Sources of Waste at Superfund Sites

Source of Waste	Share of Waste
Manufacturing operations	38.9%
Municipal landfills	16.5%
Recyclers	8.5%
Industrial landfills	6.5%
Department of Energy and Department of Defense	5.0%
Mining	2.0%
Other sources	22.5%

Source: EPA. OSWER. *Superfund: Focusing on the Nation at Large*. 1992. p. 8.

! A 1991 site characterization report indicated that liquid waste was present at 92.4% of all Superfund sites, solid waste at 58.3%, and sludge at 49.2%.⁵⁸

Table 6 lists the types of contaminants commonly found at Superfund sites.

Table 6. Types of Contaminants Commonly Found at Superfund Sites

Contaminant	Frequency of Occurrence
Organic chemicals	71.4%
Metals	64.3%
Oily wastes	35.1%
Inorganic chemicals	30.9%
Municipal waste	27.3%
Acids/bases	24.5%
PCBs (Polychlorinated biphenyls)	20.3%
Pesticides/herbicides	18.4%
Paints/pigments	17.7%
Solvents	6.3%

Source: EPA. OSWER. *Physical State of Waste. Superfund: NPL Site Characterization Project Report*. 1991. p. 54.

⁵⁸ EPA. OSWER. *Superfund: NPL Site Characterization Project Report*. 1991. p. 53.

- ! CERCLA requires the Agency for Toxic Substances and Disease Registry to establish a priority list of hazardous substances found most often at Superfund sites. **Table 7** indicates the types of chemicals most frequently encountered. To obtain a fact sheet on each chemical, refer to EPA's Superfund home page on the internet at <http://www.epa.gov/superfund/oerr/atsdr/index.htm>.

Table 7. Common Chemicals Found at Superfund Sites

Acetone	Lead
Aldrin/Dieldrin	Mercury
Arsenic	Methylene Chloride
Barium	Naphthalene
Benzene	Nickel
2-Butanone	Pentachlorophenol
Cadmium	Polychlorinated Biphenyls (PCBs)
Carbon Tetrachloride	Polycyclic Aromatic Hydrocarbons (PAHs)
Chlordane	Tetrachloroethylene
Chloroform	Toulene
Chromium	Trichloroethylene
Cyanide	Vinyl Chloride
DDT, DDE, DDD	Xylene
Dichloroethene	Zinc
Dichloroethane	

Prepared by the Congressional Research Service with information provided by the Environmental Protection Agency.

De Minimis Settlements

De minimis parties are PRPs that are responsible for a minor share of the total cleanup costs at a site and that have contributed minimally to the volume or toxic effects of hazardous waste at a site compared to other PRPs. CERCLA authorizes EPA to enter into expedited settlements with *de minimis* parties and encourages EPA to do so "as promptly as possible."⁵⁹

CERCLA authorizes *de minimis* settlements in situations where a party is the owner of the property where the facility is located but did not conduct or permit the

⁵⁹ 42 U.S.C. 9622(g). "*De Minimis Settlements*."

generation, handling or disposal of hazardous substances at the facility; did not contribute to the release or threatened release from the facility; and did not acquire the facility with knowledge that it had been used to store, handle or dispose of hazardous substances.⁶⁰

De minimis settlements can reduce EPA's administrative and judicial enforcement activities at a site by obtaining expedited cash payments for cleanup costs without resorting to extensive litigation, and can benefit small volume contributors by removing them from further liability and protecting them from litigation by other PRPs.⁶¹

"De micromis" settlements are a subset of *de minimis* settlements and are available to PRPs whose contribution to a hazardous release is a "minuscule" amount, less than the "minimal" amount contributed by *de minimis* parties. "De micromis" settlements are available to generators and transporters of waste but are not available to owners or operators of sites. Like *de minimis* settlements, "de micromis" settlements also remove PRPs from further liability and protect them from litigation by other PRPs. Whereas *de minimis* settlements do require PRPs to pay a small portion of the total cleanup costs at a site, de micromis settlements completely remove PRPs from financial liability.⁶²

- ! In 1993, EPA remedial project managers at 1,056 non-federal sites estimated that there were one or more *de minimis* parties at 175 sites and no *de minimis* parties at 609 sites. The number of *de minimis* parties was unknown at the remaining 272 sites.⁶³
- ! In 1996, GAO estimated that the total number of *de minimis* parties at these 175 sites ranged from 8,500 to more than 25,000.⁶⁴
- ! GAO also estimated that the number of PRPs contributing less than 1% to the total amount of waste at these sites may exceed 30,000. The cutoff for determining a *de minimis* party generally is 1%.⁶⁵
- ! The current number of *de minimis* parties is likely higher than GAO's estimate because data on sites added to the NPL since 1993 were not available. EPA

⁶⁰ 42 U.S.C. Sec. 9622(g)(1)(B).

⁶¹ EPA. Office of Site Remediation and Enforcement. *Revised De Minimis Contributor Consent Decree*. EPA Memorandum. September 29, 1995.

⁶² EPA. Office of Site Remediation and Enforcement. *Revised Guidance on CERCLA Settlements with De Micromis Waste Contributors*. EPA Memorandum. June 3, 1996.

⁶³ GAO. *Superfund: Number of Potentially Responsible Parties at Superfund Sites Is Difficult to Determine*. GAO/RCED-96-75. March 1996. p. 4.

⁶⁴ Ibid. The data were reported in ranges for each site. GAO reached its estimate by using the low and high ends of each range.

⁶⁵ Ibid.

projected that as many as 700 sites may be placed on the NPL in the future and that approximately 140 of these sites could have *de minimis* parties.⁶⁶

- ! By the end of FY1997, EPA had awarded a total of 340 *de minimis* settlements to more than 15,000 responsible parties. EPA awarded almost one-third of these settlements (103) in FY1997 alone to more than 1,800 responsible parties.⁶⁷

Orphan Share Settlements

Under CERCLA's joint and several liability standards, financially viable PRPs are responsible for paying the cleanup costs of defunct or financially insolvent PRPs. The share of the costs for a non-viable PRP is referred to as an orphan share.⁶⁸

- ! In FY1996 and FY1997, EPA offered a total of \$100 million in orphan share compensation to facilitate site settlements with PRPs who agree to pay the cleanup costs of orphan shares for which they are liable under CERCLA.⁶⁹
- ! During FY1997 alone, EPA offered approximately \$53 million in orphan share compensation to viable PRPs at 20 sites across the United States. Offers ranged from \$38,524 to \$15 million with an average of \$2.5 million per site.⁷⁰
- ! In 1993, EPA estimated that the annual cost to pay the entire orphan share for remedial design and action at every site where PRPs perform the remedy would range between \$150 and \$420 million per fiscal year.⁷¹

Natural Resource Damages

CERCLA makes PRPs liable for the costs of restoring natural resource damages due to a hazardous substances release and for the costs of assessing these damages.⁷² Federal, state, and tribal authorities act as trustees on behalf of the public to assess

⁶⁶ Ibid.

⁶⁷EPA. OECA. *FY1997 Enforcement and Compliance Assurance Accomplishments Report*. July 1998. p. 2-6.

⁶⁸ EPA. OECA. *Interim Guidance on Orphan Share Compensation for Settlers of Remedial Design/Remedial Action and Non-Time-Critical Removals*. June 3, 1996.

⁶⁹EPA. OERR. *Superfund Reforms FY1997 Annual Report*. p. 41-42.

⁷⁰Ibid.

⁷¹ EPA. OSWER. *Mixed Funding Evaluation Report: The Potential Costs of Orphan Shares*. September 1993.

⁷² 42 U.S.C. 9607(a)(4)(C). "Liability."

damages at contaminated sites and prepare damage claims.⁷³ In April 1996, GAO reported that federal trustees settle almost half of all claims without requiring separate payments for natural resource damages because the initial cleanup frequently repairs the damage.⁷⁴

- ! As of July 1996, federal trustees had completed settlements for natural resource damage claims with responsible parties at 67 sites for a total of \$117.6 million. The total amount of the 5 largest settlements was \$83.8 million, and settlements at the remaining 62 sites totaled \$33.8 million.⁷⁵ (Refer to **Table 8**).
- ! In March 1996, federal trustees filed the largest natural resource damage claim to date for a total of \$970 million against several mining companies for releasing hazardous substances in the Coeur d'Alene River Basin in Idaho over a hundred-year period and for injury to wildlife. Negotiations over the claim are continuing. (*United States v. ASARCO, Inc.*)
- ! The state of Montana has filed the second largest natural resource damage claim to date for a total of \$765 million against Atlantic Richland Co. for damages from mining activities in the Clark Fork River Basin. In June 1998, the state reached a \$215 million partial settlement. Of this amount, \$15 million was for the state's damage assessment and litigation costs, \$120 million was for restoration activities, and \$80 million was for cleanup costs. Negotiations over the remaining portion of the claim are continuing. (*Montana v. Atlantic Richfield Co.*)

Table 8. Five Largest Natural Resource Damage Settlements at Superfund Sites as of July 1996

Site Name and Location	Settlement
Cantara Loop Train Derailment, outside Dunsmuir, California	\$14.0 million
Commencement Bay, Tacoma, Washington	\$13.3 million
Elliot Bay, Seattle, Washington	\$24.3 million
Montrose, offshore, Los Angeles, California	\$12.0 million
New Bedford Harbor, Acushnet River, Massachusetts	\$20.2 million
Total	\$83.8 million

Prepared by the Congressional Research Service with data from the General Accounting Office.

⁷³ 42 U.S.C. 9607(f). "Natural resources liability; designation of public trustees of natural resources."

⁷⁴ GAO. *Outlook for and Experience with Natural Resource Damage Settlements*. GAO/RCED-96-71. April 1996. p. 4-5.

⁷⁵ GAO. *Superfund: Status of Selected Federal Natural Resource Damage Settlements*. GAO/RCED-97-10. November 1996. p. 1.

Land Use

EPA's survey of NPL site managers in 1994 indicated that industrial use was the most common activity on Superfund sites. However, residential use occurred most frequently in the areas surrounding a site. Educational use ranked the lowest among the major land uses. **Table 9** lists the major types of land use that occurred on Superfund sites and in the areas surrounding them as of 1994.

Table 9. On-Site and Surrounding Land Uses at Superfund Sites

Type of Land Use	On-Site Uses	Surrounding Area Uses	Total Uses
Residential	192	984	1176
Commercial	317	565	882
Industrial	384	367	751
Agricultural	69	433	502
Recreational	138	355	493
Other	289	109	398
Abandoned	361	--	361
Educational	55	116	171

"Other" includes closed landfills, military lands, undeveloped lands, wetlands, and other wildlife habitats.

Note: Of the 1,249 final and deleted Superfund sites at the time of the survey in 1994 (123 federal facilities and 1,126 non-federal sites), on-site land uses reflect data from 1,247 sites reporting while surrounding land uses reflect data from 1,245 sites reporting. Totals for land use exceed the number of Superfund sites because of multiple uses at certain sites.

Source: EPA. OSWER. Survey of NPL Site Managers. January 28, 1994.

Public Health Issues and the Agency for Toxic Substances and Disease Registry⁷⁶

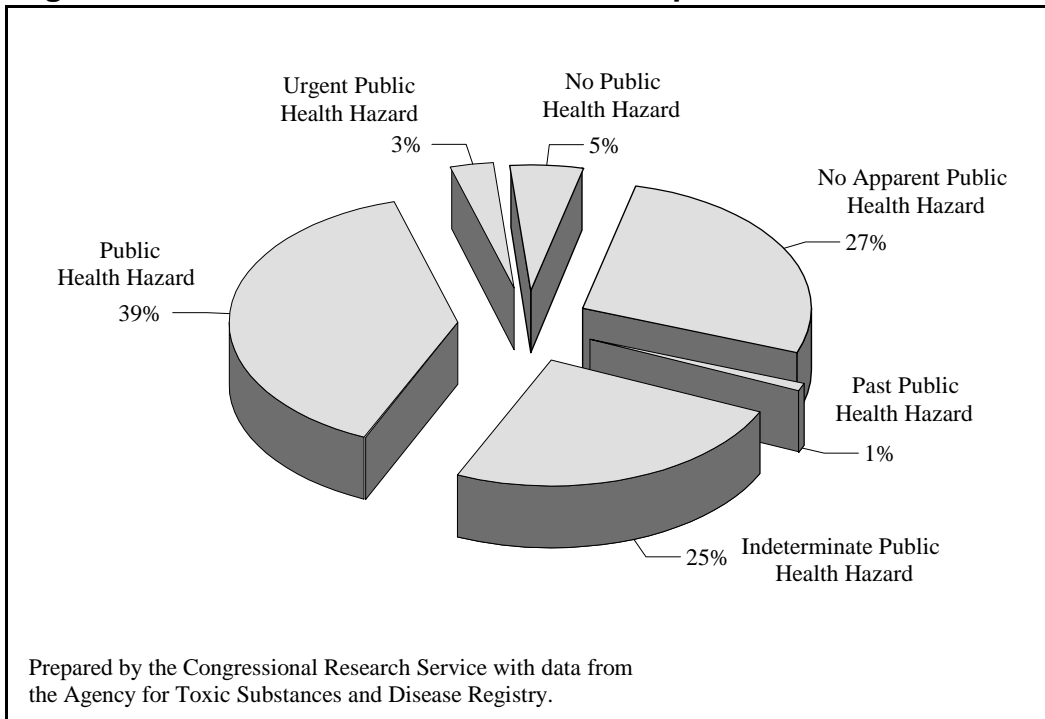
CERCLA created the Agency for Toxic Substances and Disease Registry (ATSDR), to investigate and reduce the harmful effects of exposure to hazardous substances on human health. As amended in 1986, CERCLA requires the ATSDR to conduct public health assessments of all Superfund sites proposed for the NPL and other hazardous sites in response to public petitions. CERCLA also requires the

⁷⁶Prepared by Stephen Redhead, Science, Technology, and Medicine Division. Information in this section and additional details about ATSDR's public health assessment may be found in the agency's most recent annual reports: Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, *FY1996 Agency Profile and Annual Report*, and *FY1997 Annual Report to Congress*.

ATSDR to establish a priority list of hazardous substances found most often at Superfund sites, produce toxicological profiles for each substance, initiate research to fill gaps in our understanding of the toxicology of priority substances, conduct epidemiologic studies and surveillance of exposure and health problems, establish a national registry of persons exposed to hazardous substances, and provide training and education for physicians. General information about ATSDR's programs and activities can be found on the agency's home page at <http://atsdr1.atsdr.cdc.gov:8080>.

Public Health Assessments

- ! As of February 1997, the ATSDR had completed a total of 1,826 public health assessments at 1,416 sites (1,776 assessments at NPL sites and 50 at non-NPL sites). Each public health assessment includes an evaluation of a site's environmental contamination, community health concerns, and relevant public health data that local and state health authorities provide. The ATSDR integrates these data, makes a professional judgment about the hazard posed by a site, and recommends the actions necessary to protect public health.
- ! From 1992 to 1997, the ATSDR classified 3% of Superfund sites as an Urgent Public Health Hazard; 39% as a Public Health Hazard; 1% as a Past Public Health Hazard; 25% as an Indeterminate Public Health Hazard (due to an absence of data); 27% as No Apparent Health Hazard (at the time the sites were assessed); and 5% as No Public Health Hazard. (Refer to **Figure 8**.)
- ! In 1997, the ATSDR estimated that about 12.9 million people lived within one mile of a Superfund NPL site. About 24% of that population are minorities.

Figure 8. Public Health Assessments at Superfund Sites: 1992-1997

Epidemiologic Studies

- ! Exposure studies focusing on lead show that soil is the most common pathway of exposure for children living near hazardous waste sites. Other studies have demonstrated increased exposure to hazardous compounds from consuming contaminated vegetables, beef, milk, and fish raised and caught near hazardous waste sites.
- ! The ATSDR has selected seven priority health conditions as the most important for evaluating populations living near hazardous waste sites: birth defects and reproductive disorders, cancer, immune function disorders, kidney dysfunction, liver dysfunction, lung and respiratory diseases, and neurotoxic disorders. The agency has conducted or provided funds for a variety of health studies investigating these priority health conditions.

Overall Assessment of Public Health Impact

- ! Epidemiologic findings are still unfolding. However, the health data from many Superfund sites indicate that proximity to hazardous waste sites seems to be associated with a small to moderate increased risk of certain kinds of birth defects, reduced birth weight and, though it is less well documented, some specific cancers.
- ! Data from the ATSDR's National Exposure Registry for persons exposed to benzene, dioxin, trichloroethane, or trichloroethylene indicate an elevated risk

of some chronic diseases. Stroke, liver disease, diabetes, anemia, kidney disease, and urinary tract disorders were elevated in one or more of the subregistries. These data are based on registrants' self-reported data and compared with national baseline data.

- ! Physicians and other health care providers in communities around Superfund sites have expressed a need for training and technical assistance in dealing with health concerns potentially related to exposure to hazardous substances.

Toxicological Databases

- ! The ATSDR has identified 30 hazardous substances found in 6% of sites where documented human exposure has occurred. Of those 30 substances, 4 are known human carcinogens (i.e., arsenic, benzene, chromium, and vinyl chloride) and 14 are reasonably anticipated to be carcinogenic.
- ! The ATSDR has established a national database on the public health hazards of sites that it has assessed. The database, called HazDat, is available on ATSDR's home page. HazDat contains data on environmental contamination, human exposure, toxicity of substances, and other information specific to individual Superfund sites.
- ! The ATSDR has made available to the public 200 toxicological profiles of prioritized hazardous substances. The agency has provided more than 100 fact sheets on priority substances, which are also available on the ATSDR's home page.

ATSDR Budget

- ! Although the ATSDR is a separate agency within the U.S. Department of Health and Human Services, it receives its funding from the Superfund program.
- ! The FY1999 funding level for ATSDR is \$76 million, an increase of approximately \$2 million above the amount of \$74 million for FY1998 and roughly \$12 million more than the Administration's request of \$64 million. (ATSDR's appropriation is part of the appropriation for interagency response actions. Refer to **Figure 3** on page 6.)

State Superfund Programs

The state role at Superfund sites can range from sharing cleanup costs at federally funded cleanups (as required by CERCLA) to actively managing a site. Of the roughly 10,000 CERCLIS sites, almost 90% of them are not on the NPL. At these non-NPL sites, the federal role may be limited to cleanup assessment or emergency remedial activities, or the federal government may not be involved at all. State superfund programs have the authority to assess and clean up non-NPL sites listed in CERCLIS and to identify other potentially hazardous sites for cleanup in

their jurisdictions. By the end of 1997, all 50 states had enacted legislation to authorize cleanup enforcement within their respective borders.⁷⁷

Number of State Superfund Sites

- ! In 1997, a total of 37 states maintained an official priority list, registry, or inventory of potentially hazardous sites within their jurisdictions. However, the number of sites on these lists are not comparable and cannot be aggregated because the states differ widely in the criteria used to list a site.⁷⁸
- ! States also track potentially hazardous sites by classifying them as *sites needing attention*, but states do not necessarily include these sites in their official lists. The amount of *sites needing attention* more accurately reflects the number of sites warranting cleanup than the state lists indicate. In 1997, the states reported a total of 24,000 *sites needing attention*, and 6 states reported having more than 1,000 sites in this classification. New Jersey reported 4,915 sites, the highest number among the states.⁷⁹

State Cleanup Funds

- ! Nearly all states have established funds for cleanup activities, but Nebraska and the District of Columbia do not have a fund. At the end of FY1997, the total balance of all state funds was \$1.41 billion, and the average state fund balance was \$30.1 million.⁸⁰
- ! In FY1997, the states spent a total of \$565.1 million on cleanup activities at both NPL and non-NPL sites combined. Of this amount, each state spent an average of \$12.8 million for cleanup activities. At non-NPL sites alone, the states expended \$136.5 million, with an average expenditure of \$4.4 million.⁸¹
- ! States used a variety of revenue sources to fund cleanup activities. **Table 10** lists the common sources of funding for state cleanup activities in FY1997.

Table 10. Common Sources of Funding for State Cleanup Activities in FY1997

Source of Funding	Number of States
Waste Disposal Fees	19

⁷⁷ Environmental Law Institute (ELI). *An Analysis of State Superfund Programs: 50-State Study, 1998 Update*. 1998. ELI Project #941724. p. 53. In addition to all 50 states, ELI also treated the District of Columbia and Puerto Rico as states in their study.

⁷⁸ *Ibid.*, p. 58.

⁷⁹ *Ibid.*, p. 58.

⁸⁰ *Ibid.*, p. 71.

⁸¹ *Ibid.*, p. 76.

Cost Recoveries	16
Taxes	14
Appropriations	14
User Fees	11
Penalties and Fines	10
Bonds	9
Interest	7
Fund Transfers	3
Private Contributions	1

Source: Environmental Law Institute (ELI). *An Analysis of State Superfund Programs: 50-State Study, 1998 Update*. 1998. ELI Project #941724. p. 81.

Status of State Cleanup Activities

- ! By the end of FY1997, the states had completed a total of 40,994 response actions since state-funded cleanups began. During this time, Texas performed a total of 18,994 response actions, more than any other state and 46% of total actions taken. Iowa was the only state that did not perform any actions at contaminated sites during this time period.⁸²
- ! During FY1997 alone, the states completed a total of 5,552 response actions. Of this amount, New Jersey completed a total of 2,591 response actions, the most of any state and about 46% of the total actions taken.⁸³
- ! At the end of FY1997, the states reported that a total of 13,713 response actions were underway. Of this amount, New Jersey reported a total of 4,363 pending actions, the highest number of any state and 32% of total pending actions. Hawaii reported only 1 pending action, the least among the states.⁸⁴

State Cleanup Standards

- ! State superfund programs have the flexibility to select among the federal standards or to develop their own standards for cleanup activities at non-NPL sites within their jurisdictions. In 1997, all 50 states used drinking water standards, 47 used surface water criteria, 47 used health-based risk assessment, 39 used ground water criteria, 34 used soil criteria, and 41 also

⁸² Ibid., p. 61.

⁸³ Ibid., p. 61.

⁸⁴ Ibid., p. 61.

considered future land-use when selecting or developing standards for cleanup activities.⁸⁵

State Liability Standards

- ! The majority of states have followed the federal model of strict, joint and several, and retroactive liability in their own laws to identify which parties are responsible for a hazardous release and to allocate the portion of a party's liability. In 1997, 43 states enforced retroactive liability standards, and 41 states also enforced strict liability standards. To allocate the amount of a hazardous release for which a party is responsible, 36 states enforced joint and several liability standards. In addition, 5 states allowed responsible parties to seek proportional allocation. The remaining states did not have standards for allocating liability.⁸⁶

⁸⁵ Ibid., p. 90.

⁸⁶ Ibid., p. 102.

Natural Resource Damages at State Sites

- ! By the end of 1997, 32 states had passed laws to authorize the recovery of natural resource damages at non-NPL sites within their jurisdictions.⁸⁷
- ! Under state laws, 10 states had recovered natural resource damages, and 11 states had pending natural resource damage claims.⁸⁸
- ! States also may recover natural resource damages under federal authority in CERCLA at non-NPL sites within their jurisdictions. Under federal authority, 17 states had recovered natural resource damages, and 15 states had pending natural resource damage claims.⁸⁹
- ! A total of 15 states reported that 52 natural resource restorations were complete and that 96 restorations were underway.⁹⁰

Selected Superfund Internet Resources

The following Internet resources provide a broad array of information on hazardous waste cleanup under the Superfund program ranging from such topics as cleanup status at specific sites to various perspectives on Superfund reform. CRS has made every effort to provide a fair and reasonable selection of Internet sites, but is not responsible for either the content or nature of those sites.

EPA and Other Federal Agencies

- ! EPA's Superfund home page provides comprehensive information on major aspects of the program, status of recent initiatives, data on specific sites, and links to EPA's regional offices: <http://www.epa.gov/superfund>
- ! Agency for Toxic Substances and Disease Registry provides information on public health assessments: <http://atsdr1.atsdr.cdc.gov:8080>
- ! National Institutes of Health's Superfund Basic Research Program provides information on cleanup technologies: <http://www.niehs.nih.gov/sbrp>
- ! Department of Defense Environmental Cleanup Program provides data on cleanup at military facilities: <http://www.dtic.mil/envirodod>
- ! Department of Energy Environmental Restoration Program provides data on cleanup at defense nuclear facilities: <http://www.em.doe.gov/er>
- ! Department of the Interior provides information on natural resource damages: <http://www.doi.gov/oepe>

⁸⁷ Ibid., p. 108.

⁸⁸ Ibid., p. 111.

⁸⁹ Ibid., p. 114.

⁹⁰ Ibid., p. 117.

Congressional Committees

- ! House Committee on Transportation and Infrastructure, Subcommittee on Water Resources and Environment:
<http://www.house.gov/transportation/water/water.htm>
- ! House Committee on Commerce, Subcommittee on Finance and Hazardous Materials: <http://www.house.gov/commerce/finance.html>
- ! Senate Committee on Environment and Public Works, Subcommittee on Superfund, Waste Control, and Risk Assessment:
<http://www.senate.gov/~epw/super.htm>

State Government Organizations

- ! National Governors Association: <http://www.nga.gov>
- ! Association of State and Territorial Solid Waste Management Officials:
<http://www.astswmo.org>

Professional Associations

- ! American Public Health Association: <http://www.apha.org>
- ! American Institute of Chemical Engineers: <http://www.aiche.org>

Environmental Organizations

- ! Environmental Defense Fund: <http://www.edf.org>
- ! Natural Resources Defense Council: <http://www.nrdc.org>
- ! Resources for the Future: <http://www.rff.org>
- ! Sierra Club: <http://www.sierraclub.org>

Industry

- ! American Iron and Steel Institute: <http://www.steel.org>
- ! Building Owners and Managers Association: <http://www.boma.org>
- ! Chemical Manufacturers Association: <http://www.cmahq.com>
- ! Hazardous Waste Cleanup Project: <http://envinfo.com/hwcplead.html>
- ! National Association of Manufacturers: <http://www.nam.org>
- ! National Paint and Coatings Association: <http://www.paint.org>
- ! Small Business Survival Committee: <http://www.sbcs.org>

Public Policy and Research Organizations

- ! Cato Institute: <http://www.cato.org>
- ! Competitive Enterprise Institute: <http://www.cei.org>
- ! Hazardous Substance Research Center: <http://maven.gtri.gatech.edu/hsrc.html>
- ! Heritage Foundation: <http://www.heritage.org>
- ! Political Economy Research Center: <http://www.perc.org>
- ! Superfund Innovation Network:
<http://www.lafollette.wisc.edu/superfundpa876>
- ! U.S. Public Interest Research Group: <http://www.pirg.org>

Community Interest and Information Groups

- ! Brownfields Nonprofit Network: <http://www.brownfieldsnet.org>
- ! Center for Public Integrity: <http://www.publicintegrity.org>
- ! Citizens for a Sound Economy Foundation: <http://www.cse.org>
- ! Communities at Risk: <http://www.ccae.org>
- ! People for the USA: <http://www.pfw.org>
- ! Toxics Action Center of New England: <http://www.cqs.com/tac.htm>

EPA Superfund Hotline

To speak with a regulatory specialist about cleanup requirements under CERCLA or to order federal publications concerning hazardous waste cleanup, contact EPA's Superfund Hotline at:

- ! 703-412-9810 in the Washington, D.C. metropolitan area, or
- ! 1-800-424-9346 outside of Washington.

Glossary of Superfund Terms⁹¹

Administrative order on consent. A legal agreement between EPA and PRPs whereby PRPs agree to perform or pay the cost of a site remediation. The agreement describes actions to be taken at a site and may be subject to a public comment period. Unlike a consent decree, an administrative order on consent does not have to be approved by a judge.

Administrative record. A file that is maintained, and contains all information used, by the lead agency to make its decision on the selection of a response action under CERCLA. This file is to be available for public review with a copy established at or near the site, usually at one of the information repositories. A duplicate file is held in a central location, such as an EPA Regional Office.

Agency for Toxic Substances and Disease Registry (ATSDR). This organization established under section 104(i) of CERCLA provides technical support and assistance to protect human health and worker safety, determines the toxicological and human health impacts associated with hazardous substances, develops a priority-order list of hazardous substances most frequently found at sites on the CERCLA National Priorities List, and produces toxicological profiles of chemicals.

Air stripping. A treatment system that removes, or "strips," volatile organic compounds from contaminated ground water or surface water by forcing an airstream through the water and causing the compounds to evaporate.

Alternative remedial contract system (ARCS). A strategy in which responsibility for remedial contract management is relegated to the EPA regions. An ARCS contract is a form of cost-reimbursable contract called a "cost-plus-award-fee contract," under which EPA reimburses the contractor for all allowable costs incurred.

ARAR. CERCLA section 121 requires cleanups to meet "ARARs": any "legally applicable or relevant and appropriate standard, requirement, criteria or limitation" that has been promulgated under federal or state environmental laws. The ARARs include such things as the Clean Water Act's water quality criteria, the Solid Waste Disposal Act's land disposal restrictions, and some states'

⁹¹ The definitions are taken from several sources, including:

Church, Thomas W. and Robert T. Nakamura. *Cleaning Up the Mess: Implementation Strategies in Superfund*. Washington, D.C.: The Brookings Institution [1993].

Wagner, Travis P. *The Complete Guide to the Hazardous Waste Regulations*. New York: Van Nostrand Reinhold [1992].

Business Roundtable, *101 Terms & Facts on Superfund*, November 1993.

ground water anti-degradation provisions that require cleanup to background levels. EPA can waive the ARARs in some situations.

Bioremediation. A treatment method that utilizes micro-organisms to degrade organic contaminants and convert them into non-hazardous constituents.

Brownfields. Abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

Cap. An impermeable layer that seals the top of a hazardous waste site.

Carveout. A term used to designate an exemption from CERCLA law or regulations. Generally pertains to liability for site remediations.

CERCLA. Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (P.L. 96-510).

CERCLIS or CERCLA information system. A database maintained by EPA and the states that lists sites where releases may have occurred, need to be addressed or have been addressed. CERCLIS consists of three inventories: CERCLIS Removal Inventory, CERCLIS Remedial Inventory, and CERCLIS Enforcement Inventory.

Coastal waters. For the purposes of classifying the size of discharges, means the waters of the coastal zone except for the Great Lakes and specified ports and harbors on inland rivers (40 CFR 300.5).

Comment period. A time period provided for the public to review and comment on proposed EPA actions or rulemakings following publication in the *Federal Register*.

Community relations plan. Formal plan for EPA community relations activities at Superfund sites. It is designed to ensure citizens opportunities for public involvement at the sites, and to allow them the opportunity to learn more about the site.

Consent decree. A legal document approved and issued by a judge that formalizes an agreement reached between EPA and PRPs where PRPs will perform all or part of a Superfund site remediation, and identifies other enforcement action to be taken by the Agency. The consent decree describes actions that PRPs are required to perform and is subject to a public comment period.

Construction completion. Construction completion at sites refers to the point in the cleanup process at which physical construction is complete for all remedial and removal work required at the entire site. Construction is officially complete when a document has been signed by EPA stating that all necessary remediation has been finished. While no further construction is anticipated at the site, there may still be a need for long-term, on-site activity before specified clean-up levels are met (e.g., restoration of ground water and surface water). Although

physical construction may not be necessary at some sites, these sites are also included in this category to fully portray EPA's progress.

Containment. A remediation method that seals off all possible exposure pathways between a hazardous disposal site and the environment, which generally includes capping and institutional controls.

Contribution. A legal doctrine that enables parties sued under joint and several liability to obtain compensation from other parties who may have been legally liable, but who were not proceeded against in the original court action.

Cost-effective alternative. An alternative control or corrective method identified as the best available in terms of reliability, permanence, and economic considerations.

Cost recovery. A legal proceeding, authorized under CERCLA, that allows the government to proceed against PRPs for recovery of both administrative and actual cleanup costs expended in either emergency removal or remedial activities at hazardous waste sites.

Covenant not-to-sue. CERCLA authorizes EPA to release responsible parties from liability to the United States under CERCLA, including future liability resulting from releases or threatened releases addressed by a remedial action.

Delisting. The process by which a Superfund site is removed from the National Priorities List (NPL) after it has been completely cleaned up.

Dense non-aqueous phase liquids (DNAPLs). Generally organic compounds (or mixtures of such compounds) that are immiscible (do not mix) with water.

Environment. As defined by CERCLA §101(8): "(A) the navigable waters, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Fishery Conservation and Management Act of 1976, and (B) any other surface water, ground water, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States."

Environmental income tax (EIT). A tax on corporations imposed on their modified alternative minimum taxable income over \$2 million, the proceeds of which go to the Hazardous Substance Superfund Trust Fund. The tax is 0.12% (\$12 per \$10,000 of income in excess of \$2 million). It is the Fund's largest single source of revenue, and raised \$612 million in FY1995.

Environmental response team (ERT). EPA hazardous waste experts who provide 24-hour technical assistance to EPA Regional Offices and states during all types of emergencies involving releases at hazardous disposal sites and spills of hazardous substances.

Facility. As defined by CERCLA §101(9): "(A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel."

Feedstock tax. An excise tax that is levied on 42 chemical raw materials, the proceeds of which go to the Hazardous Substance Superfund Trust Fund. The taxes range from \$0.24 to \$4.87 per ton. In FY1995 it supplied \$291 million.

Ground water. As defined by CERCLA §101(12): "water in a saturated zone or stratum beneath the surface of land or water."

Guarantor. As defined by CERCLA §101(13): "any person, other than the owner or operator, who provides evidence of financial responsibility for an owner or operator under this Act."

Hazard Ranking System (HRS). A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and states use the HRS to calculate a site score (0-100) based on the actual or potential release of hazardous substances from a site through air, surface water or ground water. A score of 28.5 places the site on the National Priorities List.

Hazardous substance. As defined by CERCLA §101(14), any substance designated or listed under the Federal Water Pollution Control Act, CERCLA, the Resource Conservation and Recovery Act, the Clean Air Act, and the Toxic Substances Control Act. The term excludes petroleum, or any fraction thereof, unless it is specifically listed under one of the mentioned laws; it also excludes natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Hazardous wastes. Those wastes that are regulated under the Resource Conservation and Recovery Act (40 CFR Part 261) either because they are "listed" or because they are ignitable, corrosive, chemically reactive, or toxic. As such, they are hazardous substances under CERCLA.

Information repository. A file containing current information, technical reports, reference documents, and technical assistance grants application information on a Superfund site. The information repository is usually located in a public building (often a library) that is convenient for local residents.

Institutional controls. Measures, such as access restrictions and deed restrictions, that separate people from the source of contamination. More than one institutional control may be used at a site.

Joint and several liability. A legal standard, where any involved party can have the legal responsibility for cleaning up the entire site, regardless of its degree of involvement, unless there is a reasonable basis for apportioning liability.

Leachate. A contaminated liquid resulting when water percolates, or trickles, through waste materials and collects components of those wastes.

Lead agency. The federal agency (or state agency operating pursuant to a contract or cooperative agreement) that has primary responsibility for coordinating response actions under the National Contingency Plan. A federal lead agency provides the On-Scene Coordinator (OSC) or Remedial Project Manager (RPM). A state lead agency carries out the same responsibilities delineated for OSCs/RPMs except coordinating and directing federal agency response actions (40 CFR 300.5).

Maximum Contaminant Level (MCL). Under the Safe Drinking Water Act, the maximum permissible level of a contaminant in water delivered to any user of a public water system.

Maximum Contaminant Level Goal (MCLG). Under the Safe Drinking Water Act, the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on human health would occur, and which includes an adequate margin of safety.

Mixed funding. The practice by which the government can assume some proportion of cleanup expenses, with other parties assuming the rest.

Monitoring wells. Special wells drilled at specific locations where ground water can be sampled at selected depths and studied to determine the direction of ground water flow and the types and amounts of contaminants present.

National Contingency Plan, or National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The basic policy directive for federal response actions under CERCLA. It sets out the organizational structure and procedures for responding to releases of hazardous substances, pollutants, and contaminants, and contains the Hazard Ranking System and the National Priorities List as appendices.

National Response Center (NRC). The federal operations center that receives notification of all releases of oil and hazardous substances into the environment.

National Response Team (NRT). Representatives of 13 federal agencies who as a team coordinate federal responses to nationally significant incidents of pollution and provide advice and technical assistance to the responding agency(ies) before and during a response action.

Natural resources. As defined by CERCLA §101(16): "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States ..., any state or local government, any foreign

government, any Indian tribe, or, if such resources are subject to a trust restriction on alienation, any member of an Indian tribe."

NBAR. Nonbinding allocation of responsibility. A device, established in SARA, that allows EPA to make a nonbinding estimate of the proportional share that each of the various responsible parties at a Superfund site should pay toward the costs of cleanup.

Notice letter. EPA's formal notice by letter to PRPs, also called a Section 104(e) letter, that CERCLA-related action is to be undertaken at a site with those PRPs being considered responsible.

NPL. National Priorities List. The list of (currently, approximately 1,200) hazardous waste sites that have been determined (by a hazard ranking score) to pose a serious threat to human health and/or the environment.

Offshore facility. As defined by CERCLA §101(17): "any facility of any kind located in, on, or under any of the navigable waters of the United States, and any facility of any kind which is subject to the jurisdiction of the United States and is located in, on, or under any other waters, other than a vessel or a public vessel."

On-scene coordinator (OSC). The federal official predesignated by EPA or the U.S. Coast Guard to coordinate and direct federal responses under the National Contingency Plan; or the DOD official designated to coordinate and direct the removal actions from releases of hazardous substances from DOD vessels and facilities (40 CFR 300.5).

Onshore facility. As defined by CERCLA §101(18): "any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under, any land or nonnavigable waters within the United States."

Operable unit. A discrete part of the entire response action that decreases a release, threat of release, or pathway of exposure (40 CFR 300.5).

ORC. Office of Regional Counsel. EPA's legal office in the regions. Typically, an ORC attorney is assigned to each Superfund case.

Orphan share. A share of waste at a site that cannot be collected because the PRP is either unidentifiable or insolvent.

Petroleum exclusion clause. Language in CERCLA §101(14) that excludes petroleum from the definition of "hazardous substance."

PRP. Potentially responsible party. Any individual or company that may have contributed to contamination at a Superfund site. Examples of PRPs include waste generators, waste transporters, current or former landowners, and site operators. One who may be liable for site cleanup costs under CERCLA.

Preliminary Assessment/Site Inspection (PA/SI). The PA is the process of collecting and reviewing available information about a known or suspected hazardous disposal site or release to determine if the site requires further study. If so, the more extensive site inspection is undertaken to gather technical information and laboratory samples. The information is used to score the site using the hazard ranking system to determine whether the site will be placed on the National Priorities List.

Pump-and-treat. A treatment process that involves removal of contaminated ground water through pumping or other processes, followed by treatment of the water and either re-injection of the water into the ground or discharge of the water to a stream or lake.

RCRA. Resource Conservation and Recovery Act of 1976 (P.L. 94-580). The principal federal law that regulates the definition, transportation, and disposal of hazardous wastes (as well as solid wastes in general). A key difference from Superfund is that it addresses current and future waste disposal practices, while Superfund was established to clean up inactive hazardous waste sites.

RD/RA. Remedial design/remedial action. The final stage of a site cleanup, when the remedy is conceived and put into effect.

Regional response team. Representatives of federal, state, and local agencies who may assist in coordination of activities at the request of the On-Scene Coordinator or Remedial Project Manager before and during response actions.

Release. As defined by CERCLA §101(22): "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)..." It excludes certain workplace releases, engine exhausts, and releases of nuclear materials covered by other law.

Relevant and appropriate requirements. Those federal or state cleanup requirements that, while not "applicable," address problems sufficiently similar to those encountered at the CERCLA site that their use is appropriate. Requirements may be relevant and appropriate if they would be "applicable" except for jurisdictional restrictions associated with the requirement (40 CFR 300.5).

Remedial action, remedy. The actual construction or implementation phase that follows the remedial design of the selected remediation alternative at a site on the National Priorities List.

Remedial action plan. A plan that details the technical approach for implementing the remedial response. It includes the methods to be followed during the entire remediation process -- from developing the remedial design to implementing the selected remedy through construction.

Remedial design. An engineering phase that follows the record of decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the National Priorities List.

Remedial project manager (RPM). The federal official designated by EPA (or the U.S. Coast Guard for vessels) to coordinate, monitor, and direct response activities under the National Contingency Plan; or the federal official the Department of Defense (DOD) designates to coordinate and direct federal response actions resulting from releases of hazardous substances, pollutants, or contaminants from DOD facilities or vessels (40 CFR 300.5).

Remedial response. A long-term action that stops or substantially reduces a release of a hazardous substance that could affect public health or the environment. The term remediation, or cleanup, is sometimes used interchangeably with the terms remedial action, removal action, response action, remedy, or corrective action.

Remediation. Activities to clean up a contaminated site.

Removal, or emergency removal. An action taken by EPA under the emergency removal provisions of CERCLA, that enables the agency to take preliminary steps to clean up a site or reduce its danger when there is an imminent and substantial threat to public health or the environment. A removal cannot exceed \$2 million or one year for any one action at any one site.

Reopener. A clause, usually included in Superfund consent decrees at government insistence, which allows the government to reopen a case and proceed legally against a responsible party who has already settled with the government, if certain contingencies occur, such as discovery of additional unexpected waste, or failure of a remedy.

Reportable quantity (RQ). The minimum quantity of a hazardous substance which, if released, is required to be reported.

Respond or response. As defined by CERCLA §101(25), "means remove, removal, remedy, and remedial action; all such terms (including the terms `removal' and `remedial action') include enforcement activities related thereto."

Retroactive liability. Parties can be held liable for releases resulting from actions prior to when Congress enacted CERCLA in 1980.

RI/FS. Remedial investigation/feasibility study. The *remedial investigation* is an engineering study that assesses the geographical, geological, and hydrological properties of a site, and the nature and extent of the hazardous waste contained therein. It is usually combined with the *feasibility study*, which identifies the various cleanup alternatives and specifies their costs and benefits.

Risk assessment. A qualitative and quantitative evaluation performed to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specific pollutants.

ROD. Record of Decision. The formal document by which an EPA administrator (usually the regional administrator) chooses the remedy to be applied at a Superfund site.

RPM. Remedial project manager. The EPA official who has charge of the remediation at a particular Superfund site.

SACM (Superfund Accelerated Cleanup Model). A model developed by EPA to accelerate remediations so that most contamination is removed early in the process.

SARA. Superfund Amendments and Reauthorization Act of 1986 (P.L. 99-499).

Section 106 order. A unilateral administrative order that allows EPA to order PRPs to perform certain remedial actions at a Superfund site, subject to treble damages and daily fines if the order is not obeyed.

Selected alternative. The remediation alternative selected for a site based on technical feasibility, permanence, reliability, and cost. The selected alternative need not be the least expensive alternative. If there are several remediation alternatives available that deal effectively with the problems at the site, EPA must choose the remedy on the basis of permanence, reliability, and cost.

Settlement. A legal agreement reached between EPA and parties at a Superfund site. The settlement outlines the payments of each party, the time frame of remediation and the remedy selected.

SITE (Superfund Innovative Technology Evaluation). This program supports development of technologies for assessing and treating waste at Superfund sites. EPA evaluates the technology and provides an assessment of its potential for future use in Superfund remediation actions. The program consists of four related components: the Demonstration Program, the Emerging Technologies Program, the Monitoring and Measurement Technologies Program, and Technology Transfer activities.

Source control action. The construction or installation and start-up of those actions necessary to prevent the continued release of hazardous substances (primarily from a source on top of or within the ground, or in buildings or other structures) into the environment (40 CFR 300.5).

Source control maintenance measures. Those measures intended to maintain the effectiveness of source control actions once such actions are operating and functioning properly, such as the maintenance of landfill caps and leachate collection systems (40 CFR 300.5).

Strict Liability. The government needs to prove only involvement at a waste site, not negligence. Under CERCLA, proof of strict causation is not necessary.

Technical Assistance Grant (TAG) Program. A grant program that provides funds for qualified citizens' groups to hire independent technical advisors to help

understand and comment on technical decisions relating to Superfund remediation actions.

Third-party suits. In the context of Superfund, third-party suits are those brought by PRPs at a site who are sued by the government, and against other PRPs who were not sued, in order to obtain compensation for their costs and expenses. See *contribution*.

United States and State. As defined by CERCLA §101(27): "the several states of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the U.S. Virgin Islands, the Commonwealth of the Northern Marianas, and any other territory or possession over which the United States has jurisdiction."

Viable PRP. A PRP that is financially solvent and that can be expected to pay its share of the total cleanup costs at a site.