



Module 1: Introduction to the Superfund Program

- This module discusses Superfund's purpose, legislative and regulatory framework, and scope. It also describes the RI/FS response process and its major players.
- Key references include:
 - ▶ The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (P.L. 96-510), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (P.L. 99-499).
 - ▶ *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*, 55 FR 8666, March 8, 1990 and 40 CFR Part 300 -- This is the major implementing regulation for the Superfund program.

Module Objectives

- ❑ **Explain the legislative history of Superfund**
- ❑ **Describe the relationship between Superfund and other environmental programs**
- ❑ **Define release, hazardous substance, National Contingency Plan, National Priorities List, potentially responsible party and operating unit**

Module Objectives (cont.)

- ❑ **List the basic steps in the Superfund remedial program**
- ❑ **Identify the three kinds of removal actions**
- ❑ **Identify key objectives for Superfund**
- ❑ **List the three ways in which a site can be listed on the NPL**
- ❑ **Explain DOE's Superfund public involvement policy**

Purpose of Superfund

- **Why a Superfund Program?**
 - **Clean up inactive hazardous waste management area**
 - **Make responsible parties (RP) pay**
 - **Contribute to prevention of chemical releases**
- **Therefore, Superfund includes:**
 - **Direct government response program**
 - **Enforcement program**
 - **Reporting of releases**
 - **EPA, State, and Community partnership**

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- The 1980 discovery of the Love Canal, NY site and similar sites was the impetus for CERCLA.
- It was initially believed that there would be only a few hundred sites, but estimates quickly grew to thousands of potential sites.
- The Superfund program has a number of ways of getting sites cleaned up:
 - ▶ EPA and States take the lead on sites and receive monies from the "Super" fund (developed from a tax on chemical and petroleum industries).
 - ▶ Federal facilities lead actions and finance cleanups at their own sites, with EPA and State oversight.
 - ▶ Enforcement provisions allow EPA to compel "potentially responsible" private parties to clean up sites that they polluted.

Legislative and Regulatory Framework

- ❑ **CERCLA -- Comprehensive Environmental Response, Compensation, and Liability Act of 1980**
 - Remedial Actions = long-term responses
 - Removal Actions = short-term mitigation of emergencies
 - \$1.6 billion Trust Fund (5 years)
- ❑ **SARA -- Superfund Amendments and Reauthorization Act of 1986**
 - Broadened and toughened enforcement authorities
 - Established statutory requirements and expectations for cleanup
 - \$8.5 billion Trust Fund (5 years)
- ❑ **Lots of current reform proposals**

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- Under CERCLA, actions are either long term (remedial actions) or short term (removal actions). Removal actions, which are discussed in a later section of this course in detail, mitigate immediate threats to human health and the environment. They do not necessarily result in the complete remediation of the site. Remedial actions, on the other hand, are intended to address all contamination at a site -- to make the site "clean."
- Removal actions are limited to one year in duration. Remedial actions require many years to complete.
- Releases of petroleum are excluded from Superfund cleanup authority.
- Unlike some other environmental restoration programs (e.g., UMTRA), the CERCLA program does not specify cleanup levels that must be achieved at each site. SARA, however, establishes a strong preference for treatment and requires that "applicable or relevant and appropriate requirements" (ARARs) be used as cleanup standards on a site-specific basis.
- SARA also added the Title III (Community Right-to-Know) program, which deals with chemical emergency preparedness, and each community's right to know what hazardous substances are stored in their community
- Statutory authority for EPA's underground storage tank program were also included in SARA.

Legislative and Regulatory Framework

□ National Contingency Plan

- Nation's blue print for responding to oil spills and hazardous substances releases.
- First developed in 1968 to cover oil spills
- Revised in 1980 (under CERCLA) to include federal response to hazardous substances releases

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- All Superfund response actions must be consistent with the NCP, which was last revised in 1990. The NCP can be found at 40 CFR Part 300.
- NCP Subparts:
 - ▶ Subpart A: Introduction (includes definitions of key terms)
 - ▶ Subpart B: Responsibility and Organization
 - ▶ Subpart C: Planning and Preparedness
 - ▶ Subpart D: Operational Response for Oil Removals
 - ▶ Subpart E: HAZARDOUS SUBSTANCE RESPONSE
 - ▶ Subpart F: STATE INVOLVEMENT IN HAZARDOUS SUBSTANCE RESPONSE
 - ▶ Subpart G: TRUSTEES FOR NATURAL RESOURCES
 - ▶ Subpart H: PARTICIPATION BY OTHER PERSONS
 - ▶ Subpart I: ADMINISTRATIVE RECORD
 - ▶ Subpart J: Use of Dispersants and Other Chemicals
 - ▶ Subpart K: Federal Facilities (Reserved)
- The capitalized sections above are the most important to personnel actually conducting Superfund actions.
- Subpart K will provide a roadmap to those NCP requirements that Federal agencies follow when conducting CERCLA response actions to releases on or from their own facilities.

Scope of the Superfund Program

- ❑ Superfund response authority covers: "Releases" or threatened "releases" of hazardous substances that pose threats to human health or the environment
- ❑ Spilling, leaking, pumping, pouring, injecting, discharging, dumping, disposing, escaping, and leaching
- ❑ Types of releases excluded from Superfund's response authority:
 - Releases resulting in exposure solely in workplace
 - Emissions from engine exhaust of vehicles
 - Nuclear releases subject to Atomic Energy Act
 - Naturally occurring substances (asbestos, radon)

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- "Release" is broadly defined to include nearly every discharge of hazardous substances to the environment.

Release means 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).

- Releases of naturally occurring materials such as radon are excluded from response. However, radon emitted from any manufactured or processed radioactive materials would not be excluded.

Scope of the Superfund Program

What are "Hazardous Substances?"

- ❑ Other statutes define "hazardous substances":
 - Federal Water Pollution Control Act (Clean Water Act) pollutants
 - Resource Conservation Recovery Act (RCRA) solid and hazardous wastes
 - Clean Air Act pollutants (including radionuclides)
 - Toxic Substances Control Act chemicals
- ❑ Superfund may designate its own contaminants or pollutants
- ❑ Petroleum and its products are specifically excluded

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- Currently, approximately 800 materials are CERCLA hazardous substances. EPA has proposed additional substances for listing.

The Superfund Response Process

Overview of Response Process



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- Community relations (public involvement) take place throughout the process.
- Site discovery can come from a variety of sources; citizen complaints, aerial surveys, and record-reviews.
- The other process steps will be covered in more detail as we progress through the course.

Superfund Remedial Program

- ❑ Preliminary Assessment
- ❑ Site Inspection
- ❑ Remedial Investigation
- ❑ Feasibility Study
- ❑ Record of Decision
- ❑ Remedial Design
- ❑ Remedial Action
- ❑ Operations and Maintenance
- ❑ Construction Complete
- ❑ NPL Site Deletion
- ❑ Community Relations

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- The basic steps to the Superfund long-term remedy process are
 - ▶ Preliminary Assessment: Determines whether this site potentially poses a threat.
 - ▶ Site Inspection: Gathers data for Hazard Ranking System (HRS) scoring to determine whether the threat posed is sufficient to include the site on the National Priorities List (NPL) (that is, make the site a Superfund site).
 - ▶ Remedial Investigation: Process of characterizing the site, sufficient to make clean-up technology decisions.
 - ▶ Feasibility Study: Process of evaluating and comparing alternative approaches to site clean up.
 - ▶ Record of Decision: Decision document that records the approach that will be taking in site clean up.
 - ▶ Remedial Design: Design and engineering performed to be able to construct or install the remedy.
 - ▶ Remedial Action: Installation or construction of the remedy.
 - ▶ Operations and maintenance: Operation of the constructed remedy (for example, operation of a pump-and-treat system).
 - ▶ Construction Complete: Designates completion of clean up activities..
 - ▶ NPL site deletion: Removal of the site from the NPL (no DOE sites have been deleted).
 - ▶ Community Relations: Community relations activities (otherwise known in DOE as public involvement activities) take place throughout the process.
 - ▶ Each of these steps will be covered in more detail later in the course.

The Superfund Response Process

- **Key Cleanup Objectives**
 - **SARA mandates that remedial actions**
 - **Protect human health and the environment**
 - **Meet Federal and State requirements (ARARs)**
 - **Be cost effective**
 - **SARA also specifies that remedial actions should**
 - **Result in permanent solutions**
 - **Use treatment to reduce the toxicity, mobility, or volume of wastes to the extent practicable**
 - **Removal actions must remove immediate threats** ¹¹

- The NCP provides some interpretation of the meaning of these objectives, but some site-specific interpretation is still necessary.
- These are the criteria that are the basis for considering what remedy should be selected.

Superfund Removal Program

- ❑ Removals can take place any time (even when clean up will be completed through a long-term remedial action)
- ❑ Authority to take quick action to remove or mitigate an imminent threat, or to stabilize a site prior to initiating long-term remediation activities
- ❑ Do not require listing on the NPL

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- Superfund removals can take place any time during the process where they are warranted. On occasion, a removal may complete the cleanup and no further action would be necessary.
- In general, a removal action is anything done to reduce or eliminate an immediate threat to human health and the environment.

How Sites are Placed on the NPL

- **National Priorities List (NPL)--Official list of Superfund sites in long-term remedial program**
- **Three mechanisms**
 - **Site evaluation and Hazard Ranking System (HRS) scoring (most common)**
 - **One-time state or territorial designation**
 - **Special threat determination**

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- The NPL is the official list of Superfund sites. Getting listed (through a rule-making procedure) makes a site a Superfund site. According to EPA, there were 1211 sites on the NPL as of May 18, 1999.
- Special cases can be added to the list if three criteria are met:
 - ▶ Agency for Toxic Substance and Disease Registry (ATSDR) issues a health advisory that recommends that people be removed from the site;
 - ▶ EPA determines there is a significant health risk; and
 - ▶ EPA anticipates that it will be more cost-effective to use its remedial authority rather than its emergency removal authority.

Remedial Program: The PA/SI Process

- ❑ Together, called “site assessment” by EPA
- ❑ Preliminary Assessment (PA)
 - Quick screen
 - No sampling
- ❑ Site Inspection (SI)
 - Limited sampling to verify releases
- ❑ Hazard Ranking System (HRS)
 - Superfund site ≥ 28.5

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- PA is a quick screen to rule out non-sites (over 36,000 potential sites have been discovered). It is based on a records review and, possibly, a site walk-around. The objective is to reject potential sites that clearly do not have the potential to become Superfund sites.
- If a site “passes” the PA, an SI is conducted. The SI collects data sufficient to develop an HRS score. Limited environmental sampling is done to verify releases of CERCLA substances.
- HRS scores site based on probable contaminants and possible receptors (human health and the environment).
- Sites scoring 28.5 or greater on the HRS are proposed for listing on the NPL through a formal rule-making process.

Community Relations Requirements

- ❑ Public comment on proposed NPL listing
- ❑ Conduct local interviews
- ❑ Prepare community relations plan
- ❑ Establish information repository, and notify public of availability
- ❑ Inform public of TAGs
- ❑ Public comment on Record of Decision
- ❑ Public notice of final ROD
- ❑ Public notice of certain ROD changes
- ❑ Public notice and comment on notice of intent to delete

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- The list in the slide above are those community relations activities that are required by law.
- Within DOE, community relations activities are known as public involvement activities.
- TAGs = Technical Assistance Grants. TAGs are grants available from EPA that the local community can use to hire experts to allow them to evaluate the work being performed by DOE and EPA. TAGs have a \$50K three-year cap, which can be renewed for an additional three years if the RI/FS process is not complete. TAGs are limited to incorporated, non-profit community groups.
- When all cleanup levels documented in the ROD have been achieved and cleanup actions have been successfully implemented and documented in a close out report, EPA considers the site for deletion from the NPL. EPA must prepare a notice of intent to delete the site from the NPL, compile the deletion docket of key materials, obtain comments from the public, and obtain the state's concurrence before finally deleting the site from the NPL.

DOE Public Involvement Policy

- ❑ Involve public early and often
- ❑ Superfund community relations *requirements* insufficient to meet DOE policy
- ❑ Typical DOE site public involvement activities include briefings, multiple public notices and meetings and development of fact sheets and other informational materials

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- DOE's policy is to involve the public much more than is strictly required by CERCLA/SARA and implementing regulations.
- Each DOE site has a public involvement office that should take the lead on implementing public involvement activities at its site.

CERFA and DOE

- **The Community Environmental Response Facilitation Act of 1992**
 - Amends CERCLA
 - Federal agencies must identify areas where hazardous materials have never been stored, released, or disposed
 - Facilitates DOE transfer of real property for economic redevelopment

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- CERFA amended CERCLA provisions dealing with federal activities on any real property owned by the government. It requires the federal government to identify those parts of that real property where no hazardous substance had been stored, released, or disposed of. This identification expedites the sale of excess property, allowing uncontaminated property to be sold before cleanup of the whole facility is completed. The prompt identification of property that will *not* require environmental remediation is intended to facilitate the transfer of such property for economic redevelopment purposes.
- Section 4 of CERFA amends CERCLA to clarify the extent of remedial action necessary to protect human health and the environment on property where hazardous substances were stored, disposed of, or released. Remedial action necessary to protect human health and the environment is deemed to have been taken if the construction and installation of an approved remedial design has been completed and the remedy has been demonstrated to EPA to be operating properly and successfully. Long-term pumping and treating of groundwater and continued operation and maintenance of remediation projects, therefore, does not preclude the sale or transfer of DOE property.

A Couple of Key Definitions

- **Potentially Responsible Party (PRP)**
 - Entity judged by EPA to be currently responsible for the site, and therefore financially responsible for the cleanup
 - DOE
- **Operable Unit (OU)**
 - A method of breaking up a large site into smaller “chunks”
 - Each OU can be remediated separately

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- PRP is either the current site owner, or the entity or entities responsible for the contamination before the site was abandoned. DOE is the PRP for all of its sites.
- An Operable Unit (OU) is a subset of a Superfund site. The division of a site into Operable Units may be based on physical areas of a site (differing contamination areas that require alternative remedial strategies), or on successive technologies that must be applied (e.g., excavation to remove a contaminant source, followed by pump-and-treat to treat residual contaminants in ground water).
- DOE sites commonly have multiple operable units.

Module Summary

- ❑ CERCLA and SARA were enacted to give EPA authority and funding to clean up abandoned, severely contaminated hazardous waste sites
- ❑ Superfund clean ups must comply with ARARs-- other relevant environmental laws and agreements
- ❑ Releases include any form of discharge into the environment of a hazardous substance

Module Summary (cont.)

- ❑ **There are currently about 800 Superfund hazardous substances--petroleum is excluded**
- ❑ **Potentially Responsible Party--DOE**
- ❑ **National Priorities List--list of Superfund Sites**
- ❑ **National Contingency Plan--Superfund implementing regulation**
- ❑ **Operating Unit--subset of a single Superfund Site**
- ❑ **Public involvement activities take place throughout the process**

Module Summary (cont.)

- **Major steps in Superfund are**
 - **Site discovery, assessment, and NPL listing**
 - **Site characterization and alternatives evaluation**
 - **Formal agreement documented in a ROD**
 - **Remedial Design**
 - **Remedial Action/Construction**
 - **Operations and Maintenance**
 - **Construction Complete/Closure**

Exercise 1

Decision-making Under Uncertainty in Superfund

□ Objectives

- Practice making early decisions about potential Superfund sites.**
- Generate discussion about some of the key concepts to be covered in the course.**