



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

January 11, 2007

Mr. Thomas Johnson  
U.S. Department of Energy  
c/o Boeing Company  
5800 Woolsey Canyon Road  
Canoga Park, CA 91304

Re: Comments on Draft EE/CAs: RMHF and Building 4024  
Santa Susanna Field Laboratory, Ventura County, California

Dear Mr. Johnson:

Thank you for providing EPA with the opportunity to review the subject documents which provide Engineering Evaluation and Cost Analyses (EE/CA) for decommissioning and decontamination (D&D) of DOE's Radioactive Materials Handling Facility (RMHF) and Building 4024. U.S. EPA and U.S. DOE agreed in a joint policy statement (May 22, 1995) that DOE decommissioning activities will be conducted as non-time critical removal actions, effectively integrating EPA oversight responsibility, DOE lead agency responsibility, and state and stakeholder participation.

In comparison to EPA's *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA*, DOE has provided a "streamlined" version of an EE/CA. Because the proposed removal actions are of limited scope, EPA is willing to limit our comments to those areas most critical to the success of the actions within the framework of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

1. References to the MOU between EPA and the Nuclear Regulatory Commission (NRC) should be removed. Use of the MOU is strictly limited to NRC licensee sites. The EPA distribution memorandum states:

"The MOU does not govern **how** response actions (e.g., removal or remedial) are conducted under CERCLA authority, at either NPL or non-NPL sites. **Response actions conducted under CERCLA authority should continue to use the CERCLA response approach**, including the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and EPA guidance documents. Cleanup levels for response actions under CERCLA are developed based on applicable, or relevant and appropriate requirements (ARARs), site-specific risk assessments, and/or to-be-considered material (TBCs). Where ARARs are not available or are not sufficiently protective, EPA generally sets site-specific remediation levels for: 1) carcinogens at a level that represents an excess upper bound lifetime cancer risk to an individual of between  $10^{-4}$  to  $10^{-6}$  (with  $10^{-6}$  as the point of departure); and for 2) non-carcinogens such that the cumulative risks from exposure will not result

Mr. Thomas Johnson  
January 11, 2007

in adverse effects to human populations (including sensitive sub-populations) that may be exposed during a lifetime or part of a lifetime, incorporating an adequate margin of safety. (See 40 C.F.R. §300.430(e)(2)(i)(A)(2).) “

The complete text of the MOU Distribution memorandum can be found at <http://www.epa.gov/superfund/resources/radiation/pdf/transmou2fin.pdf>

2. DOE should provide a more complete rationale for the selection of radionuclides of concern, including the exclusion of potassium-40, an activation product of NAK-cooled reactors.
3. DOE should provide a conceptual site model identifying the nature and extent of contamination and potential exposure pathways.
4. Please note that EPA requires use of the Reasonable Maximum Exposure (RME) when calculating risk.

EPA is providing DOE with attachments containing additional edits for the EE/CAs. Attachment A is based on the RMHF EE/CA but applies to the Building 4024 EE/CA as well. Attachment B is based on the revised Building 4024 EE/CA transmitted to EPA on 12/21/2006.

If you have any questions about the above, please call me at (415) 271-1253. Otherwise, please provide EPA with a Draft Final version of the EE/CAs at your earliest convenience.

Sincerely,

Kathy Setian  
Superfund Project Manager

Attachments A and B

## Attachment A to Comments on Draft EE/CAs RMHF and Building 4024

### Section 1.0 – Introduction

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This Engineering Evaluation and Cost Analysis (EE/CA) has been prepared to fulfill the requirements of Section 300.415(b)(4)(i) of the National Contingency Plan (NCP) for a proposed non-time critical removal action (RA). It summarizes the objectives of the RA and evaluates alternatives ~~evaluated~~ to implement the decommissioning and decontamination (D&D) of the U.S. Department of Energy's (DOE) Radioactive Materials Handling Facility (RMHF). U.S. EPA and U.S. DOE agreed in a joint policy statement (May 22, 1995) that DOE decommissioning activities will be conducted as non-time critical removal actions, effectively integrating EPA oversight responsibility, DOE lead agency responsibility, and state and stakeholder participation.

RMHF is situated within the former Energy Technology Engineering Center (ETEC) at Santa Susana Field Laboratory (SSFL) in Ventura County, California. This document provides an opportunity for interested persons to comment on the project objectives and the proposed removal action alternative as required by section 300.820(a) of the NCP.

#### 1.1 Overview of the Radioactive Materials Handling Facility

The RMHF is owned by DOE and co-operated by The Boeing Company (Boeing) on Boeing-owned land. Figure 1-1 is a location map of RMHF at SSFL. The RMHF is located in Area IV of SSFL.

The RMHF was designed and constructed in 1959 for the safe storage and handling of radioactive materials. In 1989, the RMHF was authorized for the storage and treatment of mixed wastes generated at ETEC under the Federal Resource Conservation and Recovery Act (RCRA). The RMHF is authorized for the storage of mixed wastes in containers at three specific locations within Building 4621 and the associated outdoor asphalt-paved storage yard, and Building 4022 and 4021. The treatment of wastes was limited to the small-scale neutralization of acids and waste stabilization at Building 4021.

RMHF was operational in its original capacity until research at ETEC involving radioactive materials was completed in 1988. When the DOE-sponsored activities at ETEC began to focus on the D&D of the ETEC facilities, RMHF was dedicated to the exclusive support of D&D activities at SSFL. In this capacity, only wastes containing radioactive materials were managed at the RMHF. As the D&D of ETEC and subsequent removal of radioactive materials in Area IV approaches completion, the RMHF has been progressively deactivated. Following DOE's decommissioning and decontamination of RMHF, the facility footprint will undergo RCRA closure.

## **1.2 Scope of the Proposed Action**

The scope of the RMHF D&D entails the complete removal of all above- and below-grade structural components of RMHF and any radiologically impacted soil that may exist beneath the facility's footprint. Eight numbered structures at RMHF currently remain. Appendix A provides a summary of operational use, contamination history, physical components, and evidence of radiological impact for each numbered structure at RMHF. The proposed action will demolish and remove all building components and incidental soil, which include:

- All RMHF buildings and remaining equipment;
- All concrete foundations;
- Subsurface vaults in Building 4022;
- All underground utilities, including utility lines;
- All asphalt and incidental soils (i.e., soil directly underneath the asphalt); and
- Any radiological contamination remaining in residual soil above acceptable levels in the RMHF footprint.

Radiological surveys show that contamination exists in the asphalt within the RMHF footprint. Excavation and removal of asphalt and incidental soils will likely remove this residual contamination; however, the extent of impacts to soil beneath the asphalt is unknown. DOE will conduct characterization surveys after the asphalt has been removed to determine whether any radiological contamination remains in soil above acceptable levels. DOE will remove all radiological contamination above the acceptable levels. Cleanup goals are discussed in Section 2.3.

The former RMHF leach field has been impacted with radiological materials and may contain chemical constituents. The leach field will be considered in a separate EE/CA and is not within the scope of this proposed action.

## **1.3 Justification for the Proposed Action**

DOE has chosen a non-time critical removal action approach under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as the best strategy to address the RMHF D&D because it will provide the most appropriate level of analysis, oversight, public participation, and flexibility to conduct decommissioning in a cost-effective manner that fully protects human health and the environment.

DOE has proposed to implement this approach to D&D in accordance with a joint DOE/EPA policy, signed by the U.S. Environmental Protection Agency in May 1995. The *Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* recognizes that DOE will use its CERCLA authority under Executive Order 12580 to implement non-time critical removal actions for the decommissioning of DOE facilities unless circumstances make it

inappropriate. Executive Order 12580 delegated CERCLA Section 104 authority to the Secretary of Energy, making DOE the lead agency for removal actions at DOE sites at its discretion (DOE, 1995).

The RCRA-authorization for mixed waste storage and treatment at the RMHF places an obligation on DOE to ensure that the chemical component within the wastes are managed properly and that the chemical components of the wastes do not remain within the underlying soils at unacceptable concentrations without long-term controls.

RCRA closure of the RMHF will occur under the regulatory authority of California's DTSC. In addition to RCRA closure of the RMHF, the facility will undergo investigation as part of the SSFL site-wide RCRA Corrective Action effort in the future.

The D&D of the RMHF described in this EE/CA will precede the RCRA closure process as an independent action to allow the site footprint to meet radiological standards of protectiveness for unrestricted use. DOE is authorized by Congress through the Atomic Energy Act to oversee the radiological component of mixed wastes and administer the removal of radioactive materials from the RMHF footprint. The radiological contamination places the cleanup of the RMHF buildings similarly under the authority of the Atomic Energy Act as administered by DOE under CERCLA.

After the RMHF structures and radiologically impacted soils have been removed, chemical contamination in underlying soils in the RMHF footprint will be addressed as part of the RCRA permit closure and the RCRA Corrective Action effort and is not within the scope of this EE/CA.

## **Section 2.0 – Removal Action Objectives**

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The selected alternative will remove all remaining RMHF physical components and any radiologically impacted soil above acceptable limits from the RMHF footprint. The desired outcome of this removal action is a radiologically clean area in the RMHF footprint that meets radiological cleanup standards of protectiveness for unrestricted use.

### **2.1 Demolition and Removal of RMHF Structures**

This objective encompasses the removal of all above- and below-grade RMHF structures, including buildings, foundations, utilities, and physical components associated with the RMHF.

### **2.2 Survey and Removal of Radiologically Impacted Soils**

The objective for the RMHF footprint after removal of physical components is soil free of radiological impacts to a level that is protective of human health and the environment for unrestricted use.

**2.3 Criteria and Cleanup Objectives for Action in Soil**

Action Levels for the Identification of Radiologically Impacted Soil

The action levels for radiological constituents of concern (COCs) for the proposed D&D of the RMHF under CERCLA derive from a Memorandum of Understanding (MOU) between the EPA and the Nuclear Regulatory Commission (NRC). The MOU establishes radiological constituent concentrations comparable to a 10<sup>-4</sup> excess cancer risk for a reasonably anticipated residential land use scenario. Values in the MOU are consistent with the computation of a 10<sup>-4</sup> risk in the EPA's National PRG Calculator for residential land. Table 2-1 lists the action levels for the radiological COCs that DOE has identified at the RMHF.

Based on the Preamble to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the acceptable excess cancer risk to humans from exposure to carcinogens (e.g., radiological constituents) in residential areas is 10<sup>-4</sup> (one in ten thousand) to 10<sup>-6</sup> (one in a million) excess risk of developing cancer. EPA's National PRG Calculator for residential land provides the activities listed in Table 2-1 as the equivalent of a 10<sup>-6</sup> risk for individual radionuclides. The objectives of the removal action are:

- 1) Lower the excess cumulative cancer risk to an individual from exposure to site contaminants to a nominal range of 10<sup>-4</sup> to 10<sup>-6</sup>, using 10<sup>-6</sup> as the point of departure;
- 2) Reduce the non-cancer hazard indices below 1;
- 3) Mitigate potential ecological risks during and after the removal action.

After the RMHF structures have been removed and the characterization survey of the facility footprint has been completed, if any single soil sample identifies fails to achieve the above objectives, a radiological COC above the action level, DOE will remove soil. This is to ensure that the RMHF footprint is radiologically protective of human health and the environment.

**Table 2-1. Radiological COC Action Levels of Concern for Soil Removal.**

<b>Constituent of Concern</b>	<b>Residential Soil Concentration (pCi/g)</b>
Am-241	1.87E+00 <del>187</del>
Co-60	3.61E-02 <del>4</del>
Cs-134	1.57E-01 <del>6</del>
Cs-137	5.97E-02 <del>6</del>
Eu-152	4.16E-02 <del>4</del>
Eu-154	4.99E-02 <del>5</del>
Fe-55	2.69E+03 <del>269,000</del>
H-3	2.28E+00 <del>228</del>
Mn-54	6.92E-01 <del>69</del>

Na-22	8.65E-02 <del>9</del>
Ni-59	2.08E+02 <del>20,800</del>
Ni-63	9.48E+01 <del>9,480</del>
Pu-238	2.97E+00 <del>297</del>
Pu-239	2.59E+00 <del>259</del>
Pu-240	2.60E+00 <del>260</del>
Pu-241	4.06E+02 <del>40,600</del>
Pu-242	2.73E+00 <del>273</del>
Sr-90	2.31E-01 <del>23</del>
U-234	4.01E+00 <del>401</del>
U-235	1.95E-01 <del>20</del>
U-238	7.42E-01 <del>74</del>

### Cleanup Goals for Soil

~~Where action is necessary, the cleanup goal is to reduce the average concentration of radiological COCs by at least one order of magnitude (i.e., ten times below the action level) in soil. This cleanup goal equates to a maximum average risk of  $10^{-5}$  (one in one hundred thousand).~~

~~The cleanup goal proposed in this EE/CA is the minimum cleanup level that is considered to be technically achievable, and it is consistent with past cleanup actions at SSFL. Previous cleanup experience at the site has demonstrated that actual contaminant levels after D&D may be much lower than the proposed cleanup goal.~~

## **2.4 Final Status Survey and Confirmation Report**

When excavation of all radiologically impacted soil that fails to achieve the removal objectives above the action level is complete, DOE will conduct a final status survey of the RMHF footprint and surrounding area using the guidance of the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) to confirm that the cleanup goal has been met. DOE will prepare a Removal Action Confirmation Report which will include the results of the Final Status Survey and recommendations for additional cleanup activities, if any. EPA guidance "Superfund Removal Procedures, Removal Response Reporting: POLREPS and OSC Reports" (1994) will be used as a reference.

- ~~· An area will be confirmed clean when in which all individual samples concentrations are exist below the action levels of concern in Table 2-1 will be confirmed suitable for unrestricted use.~~
- ~~· If any soil activities fall between  $10^{-6}$  and  $10^{-4}$ , a risk management decision will be made. The locations and activities of the samples will be evaluated to determine if there is a need for any further engineering (e.g., excavation) or administrative (e.g., land use controls) response. <sup>and</sup> when the average site risk meets the cleanup goal of  $10^{-5}$ .~~

A map will be provided clearly delineating the area that has been (and has not been) surveyed and classified for re-use.

## **2.5 Sampling and Analysis Plan**

Prior to conducting any sampling or analysis in conjunction with this Removal Action, DOE will submit a Sampling and Analysis Plan (SAP) for EPA comment and approval consistent with EPA guidance "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" October 1997 (EPA QA/R-5) and "Preparation of a U.S. EPA Region 9 Field Sampling Plan for Private and State-Lead Superfund Projects" August 1993 (9QA-06-93)." The SAP will address the levels of concern given in Table 2-1 above, and will include a development of data quality objectives and a Quality Assurance Project Plan. It will also present a plan for the final status survey and specify MARSSIM decision processes and criteria.

## **2.6 Applicable or Relevant and Appropriate Requirements (ARARs)**

In accordance with the NCP, non-time-critical removal actions conducted under CERCLA are required to attain applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the scope and urgency of the situation.

ARARs include Federal and State environmental or facility siting laws or regulations and action-specific ARARs such as occupational safety or worker radiation protection requirements. Additionally, other advisories, criteria, or guidance may need to be considered when determining remedies (40 CFR §300.405(g)(3)).

ARARs are divided into three groups: (1) constituent-specific, (2) location-specific, and (3) action-specific. Constituent-specific ARARs establish an acceptable amount or concentration that may remain in or be discharged to the ambient environment. Location-specific ARARs include restrictions placed on the conduct of activities solely because they occur in special locations such as wetlands, floodplains, historic properties, or critical habitat. Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous substances or other particular circumstances at a site. Action-specific ARARs include requirements imposed on removal actions such as worker safety, dust control requirements, storm water pollution plans and runoff control, transportation and disposal of hazardous and non-hazardous wastes, and control of air emissions. State requirements are ARARs if they are promulgated, substantive laws or regulations that are consistently applied and are more stringent than Federal requirements.

The D&D of the RMHF will adhere to all practicable ARARs specific to the RMHF. Relative to meeting the obligations for RCRA closure, DOE will characterize and manage wastes from the RMHF treatment and storage units in accordance with all applicable RCRA requirements.

Federal and State ARARs identified by DOE for the RMHF land area are summarized in Appendix C and will be updated as needed.

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## **Section 3.0 – Identification of Alternatives**

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This section identifies two alternatives for the RMHF D&D that were selected for further analysis. A screening process was performed to identify alternatives that would meet the removal goals in a reasonable manner, be implementable and effective, meet state and federal requirements, and address site needs.

### **3.1 No Action**

Under this alternative, the RMHF facility and potentially contaminated underlying soils would remain above action levels and would not meet the objectives identified in Section 2 of this EE/CA. The No Action alternative is included as required by CERCLA. It provides a baseline against which other alternatives can be compared.

### **3.2 Demolition and Offsite Disposal of Wastes**

This alternative would involve removal of all RMHF buildings and any soil in the RMHF footprint exceeding action levels. The following activities are included in this alternative:

- Remove equipment and demolish buildings;
- Remove all concrete foundations, including the Building 4022 vaults;
- Remove all underground utilities;
- Remove asphalt and incidental soils;
- Conduct soil sampling and remove soil if contaminants exist above action levels, repeating this process as necessary until the area is clean;
- Regrade and backfill the area with clean soil from an onsite source;
- Perform a MARSSIM-guided final status survey of the RMHF footprint;
- Dispose all wastes at approved off-site facilities as appropriate; and
- Finish site restoration

All structures and pavement would be removed using all appropriate safety and protection considerations, and a characterization survey of the exposed footprint would determine whether any radiological contaminants exist above the action levels described in Section 2.3.

Any residual contaminated soil would be excavated using standard construction equipment with all appropriate safety and protection considerations similarly in place.

Fugitive dust mitigation and storm water pollution prevention measures would be taken during all earthwork activities, and proper safeguards would be implemented for the transport of wastes to appropriate disposal facilities.

A MARSSIM-guided final status survey in the excavated areas would ensure that the cleanup standards described in Section 2.3 have been met. Following verification surveys by the California Department of Health Services, Radiation Health Branch (DHS/RHB) and the Oak Ridge Institute for Science and Education (ORISE), the excavations would be backfilled with clean backfill material and compacted. The backfilled

footprint would then be subject to a second MARSSIM-guided final status survey and again verified by the California DHS/RHB and ORISE.

Wastes generated from this removal action alternative would be characterized and segregated by waste type (i.e., decommissioned material, low-level radioactive waste, or mixed waste). The waste would be transported to and disposed of at a disposal facility appropriate to each waste type. All waste shipments would be containerized according to U.S. Department of Transportation requirements, and would be transported using established commercial truck routes.

## Section 4.0 – Analysis of Alternatives

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This section evaluates the alternatives for the D&D of RMHF based on their effectiveness, implementability, and cost. The NCP and the DOE guidance document for non-time critical removal actions *Phased Response/Early Actions, Module 4* (DOE, 1995) identify these three criteria for the evaluation of removal action alternatives as a basis for decision-makers to compare removal action alternatives.

### 4.1 Effectiveness

Alternatives were evaluated relative to their effectiveness in meeting the removal action objectives presented in Section 2. For this evaluation, the following NCP threshold and balancing criteria were considered:

- Overall protection of human health and environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Short-term effectiveness
- Reduction of toxicity, mobility, or volume
- Ability to achieve removal objectives.

#### No Action:

The No Action alternative would fail to meet the removal action objectives and RMHF would remain onsite, which would prevent the land from meeting its facility closure goals and achieving flexibility in future use.

#### Demolition and Offsite Disposal of Wastes:

This alternative represents a complete removal option, and it is assumed that the area will meet unrestricted land use requirements and be protective of human health and the environment in the long term. Exposure or release of radiological contaminants to the public will be reduced or prevented in the short-term effectiveness of the action through compliance with ARARs, including safe-handling requirements for workers and appropriate material transportation controls. This action will also support the following closure of the RMHF RCRA Part A permit.

## **4.2 Implementability**

When evaluating the implementability of the retained alternatives, the following questions were considered:

- Is the alternative technically feasible with currently available technology?
- Is the alternative technically complex or difficult to implement?
- Is the alternative administratively feasible in terms of administrative or procedural requirements?
- Are there services and materials readily available for performing the alternative?

### No Action:

The No Action alternative is highly implementable, because it requires no action.

### Demolition and Offsite Disposal of Wastes:

Based on experience dispositioning other DOE facilities nationwide, this alternative is implementable and relatively straightforward. Decontamination, demolition, and excavation are not technically complex and could be readily performed with the proper equipment, materials, and protective gear. This alternative is administratively feasible because administrative or procedural requirements, such as waste transportation, handling, and disposal requirements, can be met.

Services and materials are readily available for decontamination, demolition, and excavation activities. Conventional earthmoving equipment is available from contractors with experience working at radiological and hazardous waste sites, and personnel experienced with decontamination techniques are available.

## **4.3 Cost**

In this section, costs of alternatives are presented for comparison purposes only. In general, cost estimates include:

- Capital costs
- Labor costs
- Transportation and disposal costs
- Surveillance and maintenance costs

EPA guidance for feasibility studies suggests that actual costs should be within -30% to +50% of the estimate included in the feasibility study. The same estimation standards will be applied in this EE/CA for the purposes of analysis.

Examples of items that may affect the actual cost include:

- Changes in the anticipated characteristics of the wastes generated, resulting in higher disposal fees;
- Discovery of unanticipated contamination; and
- Changes in the cost of labor, fuel, and regulations that are different from historical averages.

Mr. Thomas Johnson  
January 11, 2007

Each of these factors may have a significant impact on the total life cycle cost for a given alternative.

No Action:

The no action alternative would result in the need for continued surveillance and maintenance activities at RMHF to fulfill the requirements of the RCRA authorization at the facility. This includes labor costs, radiation safety support labor and materials (dosimeters, etc.), and the production of an Annual Site Evaluation Report. This is estimated to cost approximately \$1 million per year for as long as the facility remains. Additionally, the continued presence of RMHF would require DOE to secure a full RCRA Part B permit to supplant its current RCRA authorization, which would require a one-time cost of \$450,000.

Demolition and Offsite Disposal of Wastes:

The estimated cost for D&D of RMHF and appropriate disposal of wastes under this alternative is approximately \$13 million.

**4.4 Preferred Alternative**

Based on the analysis in this section, the preferred alternative is the Demolition and Offsite Disposal of Wastes. This alternative will provide the most effective protection of human health and the environment while facilitating the final closure of RMHF. An evaluation of risks associated with the implementation of this alternative is included as Appendix B.

Appendices A, B, and C and References should be included as written.

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## Attachment B to Comments on Draft EE/CAs Revised Building 4024 EE/CA

Page G-1:

*Applicable or Relevant and Appropriate Requirement (ARAR):* A legal standard outside of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) that must be met (applicable) or should be met (relevant and appropriate) when cleaning up a site.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires compliance with any promulgated standard requirements, criteria, or limitation under Federal and more stringent State environmental laws. Examples include state or local cleanup laws, the Clean Water Act, Endangered Species Act, etc.

ARARs are introduced in the National Contingency Plan (NCP):

*Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):* A

Federal law, known as Superfund passed in 1980, and reauthorized by the Superfund

Amendments and Reauthorization Act (SARA) in 1986. The law authorizes the Federal government to respond directly to releases of hazardous substances that may endanger public health or the environment.

imposes strict joint and several liability for cleaning up environmentally contaminated land. Potentially responsible parties include any current or previous owner, generator, transporter, disposer, or party who treated hazardous waste at the site. Strict liability means that each and every party is liable for the full cost of remediation, even parties who were not contaminators. Joint and several liability makes each party liable for the full cost of cleanup.

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