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Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act Section 120(e)(5)

**Annual Report to Congress
for Fiscal Year 1992**

**U.S. Department of Energy
Washington, DC 20585**

August 1993

MASTER

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) is committed to conducting its operations in a safe and environmentally sound manner. High priorities for the Department are identifying and correcting environmental problems at DOE facilities that resulted from past operations, and preventing environmental problems from occurring during present and future operations. In this regard, the Department is committed to clean up the 1989 inventory of sites in the Environmental Restoration Program by the year 2019. DOE has issued an Order and guidance establishing policy and procedures for activities conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and has developed a Five-Year Plan, updated annually, that integrates planning for corrective activities, environmental restoration, and waste management operations at its facilities. DOE also continues to conduct assessments (e.g., Management Audits, Environmental Safety and Health (ES&H) Progress Assessments, Internal Self Assessments) at its operating facilities to provide the Secretary of Energy with information on current environmental compliance status and follow-up on findings.

During Fiscal Year (FY) 92 and early FY 93, DOE made significant progress in reaching agreements with regulatory entities, undertaking cleanup actions, and initiating preventive measures designed to eliminate future environmental problems. These accomplishments include:

- Initiation, continuation, or completion of remedial investigation/feasibility studies (RI/FSs) at all 17 DOE facilities on the National Priorities List (NPL);
- Execution of six CERCLA Section 120 Interagency Agreements (IAGs);
- Approval/signature of five final Records of Decision (RODs) and ten interim action RODs;
- Conducted removal actions or interim remedial actions at all 17 NPL DOE facilities;
- Conducted five Tiger Team Assessments in Calendar Year 1992; and,
- Initiation or continuation of cleanup activities at 78 non-NPL facilities listed on the U.S. Environmental Protection Agency's (EPA's) Federal Agency Waste Compliance Docket.

Specific information on these activities is presented in the detailed analysis of the status of CERCLA 120(e)(5) activities provided in Section II.

DOE is conducting remedial activities at all 17 of its facilities that are currently listed on the CERCLA NPL. These NPL facilities include:

- Brookhaven National Laboratory, New York;
- Fernald Environmental Management Project, Ohio (formerly Feed Materials Production Center);
- Hanford Site, Washington;
- Idaho National Engineering Laboratory, Idaho;
- Lawrence Livermore National Laboratory-Main Site, California;
- Lawrence Livermore National Laboratory-Site 300, California;
- Maywood Site, New Jersey;
- Monticello Mill Site, Utah;
- Monticello Vicinity Properties, Utah;
- Mound Plant, Ohio;
- Oak Ridge Reservation, Tennessee;
- Rocky Flats Plant, Colorado;
- Ross Complex, Washington;
- Savannah River Site, South Carolina;
- St. Louis Site (St. Louis Airport Site, Latty Avenue Properties and Vicinity Properties), Missouri;
- Wayne Site, New Jersey; and
- Weldon Spring Quarry and Feed Materials Plant and Raffinate Pits Site, Missouri (designated by DOE as Weldon Spring Site Remedial Action Project).

No new DOE facilities have been listed on the NPL since 1990; however, one new site (Pantex Plant, Texas) was proposed for listing on July 29, 1991.

Three of the aforementioned sites (Maywood, St. Louis and Wayne Sites) have been designated by Congress to be used by DOE as decontamination research and development demonstration projects. The primary activity conducted at these sites is remediation of radioactive contamination.

During FY 92, DOE executed five IAGs. IAGs are sanctions styled as Federal Facility Agreements (FFAs), Federal Facility Consent Agreements, or Tri-Party Agreements (TPAs). Section 120(e)(2) of CERCLA requires that within 180 days after a remedial investigation/feasibility study (RI/FS) has been completed, that an IAG be executed prior to commencement of a remedial action. It is DOE's policy to enter into such IAGs much earlier in the CERCLA process. These IAGs, as specified in Section 120(e)(2) of CERCLA, are designed for expeditions completion of all necessary remedial action conducted at a given site. IAGs were executed during FY 92 at the following facilities:

- Brookhaven National Laboratory, New York on February 28, 1992;
- Idaho National Engineering Laboratory, Idaho, on December 9, 1991;
- Lawrence Livermore National Laboratory - Site 300, California, on June 29, 1992;
- Oak Ridge Reservation (Oak Ridge National Laboratory; Y-12 Plant; K-25 [formerly Oak Ridge Gaseous Diffusion Plant], Oak Ridge Associated Universities, and Off-site Clinch River, Tennessee) on January 1, 1992; and
- Weldon Spring Site Remedial Action Project, Missouri on January 28, 1992. Note that an amended IAG was signed on June 30, 1992 to modify milestones.

IAG-related activities were also undertaken at three facilities during 1992. These activities include:

- Renegotiation of the Weldon Spring IAG to include the State of Missouri as a party;
- Revision of the IAG for the Hanford Site was published in September 1992; and
- Renegotiation of the Mound IAG to include the State of Ohio as a party.

An IAG was also executed in early 1993 for another DOE facility listed on the NPL during preparation of this Report to Congress. This facility is:

- Savannah River Site, South Carolina on January 15, 1993.

A ROD is issued by EPA as the final remedial action plan for a site or operable unit (OU). The ROD summarizes the problems posed by the conditions at a site, the alternative remedies considered for addressing those problems, and the comparative analysis of those alternative remedies against nine evaluation criteria. Interim Action RODs are actions that initiate remediation of a site, but may not constitute the final remedy. One final ROD, for Lawrence Livermore National Laboratory - Main Site, California, was approved during 1992. Three final RODs and four Interim Action RODs were signed for Idaho National Engineering Laboratory, Idaho during 1992. Additionally, one Interim Action ROD was submitted to regulatory agencies for review and comment. One final ROD and three Interim Action RODs were signed at the Oak Ridge Reservation. Three Interim Action RODs were also approved in early 1993 by regulatory authorities for the Savannah River Site. One draft ROD was issued for comment for the Ross Complex, Washington, during 1992.

Response actions were initiated or on-going at all 17 DOE facilities listed on the NPL by the close of Calendar Year 1992. These actions primarily took the form of removal actions, interim actions, or onset of final remediation activities.

The five DOE facilities where Tiger Team Assessments were conducted during 1992 are Ames Laboratory, Ames, Iowa; Strategic Petroleum Reserve Sites in Texas and Louisiana; National Institute for Petroleum Energy Research, Bartlesville, Oklahoma; Fermi National Accelerator Laboratory, Batavia, Illinois; and Naval Petroleum Oil Shale Reserves, Casper, Wyoming. Eleven of the total 35 Tiger Team Assessments were conducted at NPL sites. Copies of the assessment reports are available for public review in the DOE public reading rooms in Washington, DC, at the facility or the appropriate DOE Field Office. In addition, six ES&H Progress Assessments, which are intended as follow-up efforts to earlier Tiger Team Assessments, were conducted during 1992 and 1993.

DOE is also investigating or conducting cleanup activities at 15 non-NPL sites. This Report presents detailed information on the following sites:

- Covington Substation (BPA), Washington;
- Hinton Hazardous Waste Storage Facility (WAPA), Iowa;
- Hoe Creek, Wyoming;
- Kansas City Plant, Missouri;
- Lawrence Berkeley Laboratory, California;
- Los Alamos National Laboratory, New Mexico;
- Midway Substation (BPA), Washington;
- Nevada Test Site, Nevada;
- Paducah Gaseous Diffusion Plant, Kentucky;
- Pantex Plant, Texas;
- Pinellas Plant, Florida;

- Portsmouth Gaseous Diffusion Plant, Ohio;
- Sandia National Laboratory, New Mexico;
- Sandia National Laboratories, California; and
- Tracy Pump and Substation (WAPA), California.

A listing of the non NPL sites appears in the "State by State Status of DOE Facilities" on pages III-2 to III-12.

I. INTRODUCTION

A. CERCLA 120(e)(5) Requirements

This is the sixth annual Report to Congress on the U.S. Department of Energy's (DOE) progress in implementing the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). As required by CERCLA section 120(e)(5), each department, agency, or instrumentality of the United States Government responsible for compliance with section 120 shall furnish an annual report to Congress concerning its progress in implementing the requirements of section 120. The reports are to include, but need not be limited to, each of the following items:

- (A) A report on the progress in reaching interagency agreements (IAGs) under section 120(e)(1) and (2);*
- (B) The specific cost estimates and budgetary proposals involved in each IAG;*
- (C) A brief summary of the public comments regarding each proposed IAG;*
- (D) A description of the instances in which no IAG was reached;*
- (E) A report on progress in conducting remedial investigations and feasibility studies (RI/FSSs) required by SARA section 120(e)(1) at National Priorities List (NPL) sites;*
- (F) A report on progress in conducting remedial actions at NPL sites; and*
- (G) A report on progress in conducting remedial action at facilities that are not listed on the NPL.*

The annual report is also required to contain a description, on a state-by-state basis, of the status of each DOE facility subject to this section, including a description of the hazard presented by each facility, plans and schedules for initiating and completing response actions, enforcement status (where appropriate), and, an explanation of any postponements or failure to complete response actions. To fulfill this requirement, the information has been presented in Table III-1 of this Report for sites identified on Update #7 of the Federal Agency Waste Compliance Docket (Docket). In addition, DOE has developed detailed site descriptions for selected Docket sites that have environmental restoration activities underway. Site descriptions for all DOE facilities listed on the NPL are found in Section II.H of this report. Similarly, descriptions of select non-NPL sites undergoing significant cleanup activity are

presented in Section II.I. In addition, a comprehensive state-by-state listing of all DOE facilities listed on the Docket and NPL, accompanied by a brief summary of relevant environmental plans and scheduling information, is provided in Section III (Table III-1) of this report.

This Report to Congress summarizes DOE's progress on section 120 activities listed above for FY 92. Significant activities that have occurred in the first two quarters of FY 1993, during preparation of this report, have also been identified where appropriate. The introductory section of this report discusses DOE's policies and programs to implement CERCLA, and, provides background information for specific DOE Headquarters management organizations that carry out the CERCLA activities. Section II of this report summarizes DOE's progress in responding to the section 120 requirements. Section III provides a brief state-by-state discussion of contamination problems and significant current and historical CERCLA activities undertaken at each DOE facility subject to section 120 of CERCLA. Section IV discusses DOE's ongoing research and development (R&D) efforts for remedial technology. Appendix A contains a list of acronyms and abbreviations used throughout this report, and Appendix B provides an index to discussion of individual facilities in the report.

B. Background

1. Federal Facilities Docket and National Priority Listing

CERCLA section 120(c) requires EPA to establish a Federal Agency Hazardous Waste Compliance Docket (Docket), which is a compilation of information submitted to EPA by Federal agencies under RCRA sections 3005, 3010, and 3016 and CERCLA section 103. Under CERCLA section 120(d), Federal facilities are required to provide EPA with preliminary assessments (PAs) of the facilities on the Docket within 18 months of their listing in the Federal Register (FR) unless exempted by the criteria described in the FR.

Table I-1 lists DOE facilities required to submit PAs which appear in the various Docket updates. The number of facilities listed below has been adjusted to reflect information brought to EPA's attention following each Docket update publication in the FR.

TABLE I-1. DOCKET UPDATE INVOLVING DOE FACILITIES

Docket Update	# DOE Facilities Required to Submit PAs	Date Required for Submittal
FR February 12, 1988	35	April 17, 1988
FR November 16, 1988	25	May 16, 1990
FR December 15, 1989	1	June 15, 1991
FR August 22, 1990	3	February 22, 1992
FR September 27, 1991	12	March 27, 1993
FR December 12, 1991	4	June 12, 1993
FR July 17, 1992	1	January 17, 1994
FR February 5, 1993	15	August 5, 1994

Upon review of the PA and necessary site investigation (SI) information, EPA ranks facilities for inclusion on the NPL through the application of the Hazard Ranking System (HRS). Facilities which score above 28.5 are subsequently proposed for inclusion on the NPL. Prior to FY 92, 17 DOE facilities were listed on the NPL; no sites were added during FY 92. One DOE facility is currently proposed for the NPL. Additional DOE facilities may be proposed in the future.

Table I-2 identifies DOE facilities listed on the NPL and provides dates when these facilities were listed.

C. Department of Energy Policy and Programs for Implementing CERCLA

1. Department of Energy CERCLA Policy

It is DOE's policy that compliance with the letter and spirit of environmental laws, regulations, and requirements is an integral part of operations at DOE facilities. The fundamental goal is to ensure that risks to human health and to the environment posed by the Department's past, present, and future operations are either eliminated or reduced to prescribed, safe levels. DOE's goal is to cleanup all of its sites by the year 2019.

As a result of 50 years of past operation during which the production of defense nuclear materials was emphasized, the Department faces an enormous task in characterizing and remediating numerous facilities across the country. A Five-Year Plan has been developed to plan for environmental restoration of DOE's waste sites and for compliance with applicable environmental requirements. The Five-Year Plan, which includes activities under CERCLA, is further discussed in Section I.C.2 of this report.

TABLE I-2. DEPARTMENT OF ENERGY FACILITIES ON THE NPL

Site Name	State	Date Listed in Federal Register
Maywood Site ¹	NJ	09/08/83
Wayne Site ¹	NJ	09/21/84
Monticello Vicinity Properties	UT	06/10/86
Lawrence Livermore National Laboratory - Main Site	CA	07/22/87
Weldon Spring Quarry and Feed Materials Plant and Raffinate Pits	MO	07/22/87 03/13/89 ²
Hanford Site (4 separate sites)	WA	10/04/89
Rocky Flats Plant	CO	10/04/89
St. Louis Site ¹	MO	10/04/89
Monticello Mill Site	UT	11/21/89
Brookhaven National Laboratory	NY	11/21/89
Fernald Environmental Management Project ³	OH	11/21/89
Idaho National Engineering Laboratory	ID	11/21/89
Mound Plant	OH	11/21/89
Oak Ridge Reservation	TN	11/21/89
Ross Complex (Bonneville Power Administration)	WA	11/21/89
Savannah River Site	SC	11/21/89
Lawrence Livermore National Laboratory - Site 300	CA	08/30/90

¹ Wayne, Maywood and parts of the St. Louis Site were not owned or operated by DOE or its predecessor agencies; Congress directed DOE to remediate these sites.

² The Feed Materials Plant and Raffinate Pits were added to the site 3/13/89.

³ Formerly known as Feed Materials Production Center.

On October 6, 1989, DOE issued Order 5400.4, "Comprehensive Environmental Response, Compensation, and Liability Act Requirements," which formally establishes DOE's internal program responsibilities, and policies for implementing CERCLA requirements. Specifically, this Order establishes that:

- DOE will respond to releases and potentially imminent releases of hazardous substances. This response will be in accordance with CERCLA, as amended, as well as with the National Contingency Plan (NCP) and Executive Order 12580 (DOE's response will include both removal and remedial actions, as appropriate);

- DOE will enter into IAGs with Federal, State, and local entities for the preparation of RI/FSs and implementation of remedial actions under section 120(e) of CERCLA;
- Where DOE is conducting cleanup activities under another authority, it will ensure that these activities are not inconsistent with the NCP;
- It is DOE's policy to integrate National Environmental Policy Act (NEPA) values with the requirements of CERCLA, wherever practical; and
- Where DOE determines that natural resources for which it has been granted trusteeship may have been potentially injured by a release, it will implement the Natural Resource Damage Assessment Process consistent with applicable requirements.

DOE Order 5400.4 is currently under revision to incorporate a section on compliance with the Emergency Planning and Community Right-to-Know Act (EPCRA).

2. Department of Energy CERCLA Management Structure (Headquarters)

a. Office of Environmental Restoration and Waste Management (EM)

EM is the DOE's line organization to centrally manage environmental restoration, waste management, and waste R&D activities, including most of the Department's CERCLA activities. EM is responsible for the majority of DOE sites that require environmental restoration, as well as facilities used exclusively for long-term storage of DOE waste materials. However, cleanup of facilities under the Power Marketing Administrations, Offices of Energy Efficiency and Renewable Energy, Fossil Energy, or Naval Facilities Program Offices are not under EM management.

Within EM, the Office of Environmental Restoration (EM-40), the Office of Technology Development (EM-50), and the Office of Facility Transition (EM-60) are involved in CERCLA activities. An overview of EM-40 and EM-60 are provided below; EM-50 is discussed in Section IV along with DOE's restoration-related R&D efforts.

Office of Environmental Restoration (EM-40)

EM-40 manages and directs programs and activities to achieve, by the year 2019, the goal of assessment and cleanup of the initial inventory of inactive facilities and sites contaminated by wastes generated from past DOE (and predecessor agency) programs.

Specific functions of EM-40 include the following:

- Management of removal and remedial response action programs and activities which include all aspects of the assessment and cleanup of inactive potential release sites, including (1) site discovery, preliminary assessment, and site inspection; (2) RI/FS, proposed plan, and Record of Decision (ROD); (3) cleanup and site closure; and (4) post-cleanup site monitoring;
- Management of decontamination and decommissioning (D&D) programs and activities under the Atomic Energy Act and CERCLA. D&D activities include assessment and characterization, environmental review, engineering, decontamination or decommissioning operations, and closeout. Most D&D activities are concerned with facilities such as reactors, hot cells, processing plants, storage tanks, and other structures;
- Input to the annual update of the EM Five-Year Plan for activities; and,
- Formulation and monitoring of annual budget requests for environmental restoration activities identified in the Five-Year Plan.

Office of Facility Transition (EM-60)

EM-60 plans, implements and manages the transition program for the orderly transfer of facilities from operating programs to safe storage for remediation under CERCLA and/or D&D.

Specific objectives of EM-60 are to:

- Implement a DOE-wide transition process;
- Manage/facilitate development of site-specific transition plans;
- Minimize socio-economic impacts of transition;
- Minimize environment, safety and health and security risks posed by facilities in transition; and
- Maximize reuse of facilities by the government and/or private sector.

Facility transition is broken into five phases: operation termination, surplus, program acceptance, deactivation, and D & D.

b. Office of Environment, Safety and Health (EH)

The DOE Office of Environment, Safety and Health (EH), which reports independently to the Secretary, oversees and assesses compliance by DOE facilities with policies and standards mandated by Federal statutes and DOE Orders for the protection of the environment, as well as for the safety and health of DOE employees and the public. EH also plays the lead role in the development of environmental policy and guidance for DOE, and provides support to field and program offices in all aspects of environmental compliance.

This office was established to ensure DOE conformance with all applicable environmental laws and regulations; to provide guidance, coordination, and support; and, to act as liaison between DOE Headquarters and Federal and State environmental regulatory agencies (e.g., U.S. Environmental Protection Agency [EPA]) on policy issues. The Office of Environmental Compliance (EH-22) and the Office of Environmental Guidance (EH-23) are the primary environmental offices within EH that are involved in CERCLA activities. The missions of each of these offices are described in the following paragraphs. Other offices supporting various CERCLA activities include the Office of Environmental Audit (EH-24), the Office of NEPA Oversight (EH-25), and the Office of Special Projects (EH-5). EH-24 provides an independent Headquarters oversight of the Department's facilities through administration of an environmental audit program. Ascertaining CERCLA compliance is included in the scope and protocols of the Environmental Audit program. EH-25 supports the timely implementation of the Department's proposed remedial actions by coordinating with the EH-22 to ensure compliance with DOE's integrated NEPA/CERCLA policy. Additionally, EH-5 manages DOE's Tiger Team Assessments and follow-up Progress Assessments. These assessments provide the Secretary of Energy with the status of environment, safety and health programs, including CERCLA programs, at individual DOE facilities.

Office of Environmental Compliance (EH-22)

EH-22 is responsible for establishing and promoting environmental compliance policies and complex-wide strategies for attaining and maintaining environmental compliance at DOE Field Offices and facilities with applicable environmental laws and regulations. The Office independently addresses implementation issues related to environmental restoration programs at DOE Field Offices and facilities through coordination, support, and compliance oversight functions and responsibilities. To strengthen and update its role and responsibilities, EH-22 reorganized in December 1992. The newly constituted divisions are: (1) the Compliance Strategies Division which develops DOE-wide environmental compliance policies and strategies and resolves complex-wide significant environmental compliance issues; and, (2) the Facility Compliance Division which promotes exemplary environmental protection policies and programs to attain and maintain environmental compliance at DOE's active and inactive facilities. In addition, EH-22 reviews significant CERCLA documents prepared by Field Offices

to ensure that DOE's cleanup policies and decision-making procedures are implemented consistently within the DOE complex. The Office participates with Field Offices and line management organizations in negotiations with Federal and State regulatory agencies for cleanup agreements under the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA) and CERCLA. In 1992, EH-22 assisted in the negotiation and execution of five CERCLA 120 Agreements. In addition, the two-party IAG (EPA/DOE) is being renegotiated with EH-22 support to include the State as a party (see discussion concerning Mound, OH and Weldon Spring, MO in Chapter II).

Office of Environmental Guidance (EH-23)

EH-23 provides DOE Headquarters and Field Offices with policy and guidance on environmental issues critical to the success of the Department's varied programmatic missions. In fulfilling this charge, EH-23 monitors legislative and regulatory developments to keep Department personnel abreast of emerging and changing environmental requirements; coordinates Departmental comment on proposed rulemaking efforts; and, develops guidance and training initiatives to respond to such developments. During the past year, EH-23 has been very active in both the CERCLA and RCRA arenas.

During FY 92, EH-23, building on the previous year's efforts, continued its endeavors to streamline the RI/FS process within the DOE environmental restoration program. Additionally, EH-23 continued to provide environmental restoration related training to the DOE community by developing and presenting CERCLA orientation RI/FS and other CERCLA-related Workshops at various DOE Field Offices. EH-23 also published the following CERCLA-related guidance manuals:

- "Public Participation in Environmental Restoration Activities;"
- "Emergency Planning and Community Right-to-Know Act (EPCRA);"
- "Health Assessment and Other Activities of the ATSDR;"
- "Natural Resource Trusteeship and Ecological Evaluation for Environmental Restoration at DOE Facilities;"
- "Compendium of CERCLA ARARs Fact Sheets;" and
- "Glossary of CERCLA-Related Terms and Acronyms".

Office of Epidemiology and Health Surveillance (EH-42)

On November 4, 1992, DOE and the Agency for Toxic Substances and Disease Registry (ATSDR) executed a Memorandum of Understanding (MOU) which provides for: (1) the conduct of public health assessments and health consultations by ATSDR at DOE NPL sites, petitioned sites, and other high priority DOE facilities, as requested; (2) associated long term health related activities for these sites; and (3) the preparation of toxicological profiles by ATSDR. Such long term health related activities are coordinated with the Department of Health and Human Services Advisory Committee as part of the agenda being developed for energy-related analytic epidemiologic studies. EH's Office of Epidemiology & Health Surveillance (EH-42) is responsible for coordinating DOE's participation in the MOU.

II. STATUS OF DEPARTMENT OF ENERGY 1992 CERCLA 120(e)(5) ACTIVITIES

This section of the report summarizes information required by CERCLA 120(e)(5), including the status of the IAGs, cost estimates and budgetary proposals for the NPL remedial actions, and progress in conducting RI/FSs and remedial actions at NPL and non-NPL DOE sites. This section also contains a detailed description of each NPL listed DOE facility, as well as select non-NPL listed DOE facilities that are undergoing significant clean-up activity. The text for these detailed descriptions includes information on each facility's NPL status (if applicable), a summary of background information and environmental conditions, and applicable information satisfying the CERCLA section 120(e)(5) information requirements. A comprehensive state-by-state listing of all NPL and non-NPL listed DOE facilities identified on the Docket (Update #7) can be found in Table III-1 (Section III) of this report. Table III-1 provides brief highlights concerning relevant plans and scheduling information for each DOE facility.

A. Progress in Reaching Interagency Agreements

CERCLA section 120(e)(2) requires that within 180 days after EPA's review of an RI/FS, the Federal facility must enter into an IAG for the expeditious completion of all necessary remedial action. Also, an IAG between EPA and the Federal facility must be executed before remedial actions are implemented. However, it is DOE policy to be proactive regarding this requirement and to enter into broader, enforceable FFAs, Federal Facility Consent Agreements or Tri-Party Agreements (TPAs) with EPA, and the respective State, if possible. These Agreements include provisions addressing both the RI/FS and remedial action implementation. These Agreements meet the requirements of IAGs as specified in CERCLA section 120(e)(2). For purposes of consistency with the requirements of CERCLA 120(e), all CERCLA agreements will be identified as IAGs throughout this Report to Congress.

As of January 1993, DOE has executed IAGs at all 17 NPL listed DOE facilities. Prior to FY 92, DOE had executed 11 IAGs with EPA Regional Offices and, where possible, appropriate State regulatory agencies. The 11 DOE facilities on the NPL for which agreements were reached prior to FY 92 are:

- Lawrence Livermore National Laboratory - Main Site, California, on November 1, 1988;
- Monticello Mill Site, Utah, on December 22, 1988;
- Monticello Vicinity Properties, Utah, on December 22, 1988;

- Hanford Site, Washington, on May 15, 1989 (Revision 2 published in September, 1992);
- Ross Complex, Washington, on May 1, 1990;
- St. Louis Site, Missouri, on June 26, 1990;
- Fernald Environmental Management Project (formerly known as Feed Materials Production Center), Ohio, on June 29, 1990;
- Mound Plant, Ohio, in August 6, 1990 (under renegotiation to include the State of Ohio as a party with anticipation of completion in May, 1993);
- Rocky Flats Plant, Colorado, on January 22, 1991;
- Maywood Site, New Jersey, on April 22, 1991; and
- Wayne Site, New Jersey, on April 22, 1991.
- Weldon Spring Site Remedial Action Project, Missouri on August 22, 1986 (first amendment IAG modifying milestones signed on June 30, 1992) (under renegotiation to include State of Missouri as a party with anticipation of completion in July, 1993);

During FY 92, four new IAGs were executed under CERCLA section 120 for DOE facilities listed on the NPL. These facilities include:

- Idaho National Engineering Laboratory, Idaho, on December 9, 1991;
- Oak Ridge Reservation, Tennessee, on January 1, 1992;
- Brookhaven National Laboratory, New York, executed on February 28, 1992, effective May 27, 1992; and
- Lawrence Livermore National Laboratory - Site 300, California, on June 29, 1992.

An IAG was also reached in January of 1993 for one additional NPL-listed DOE facility during preparation of this Report to Congress. This facility is:

- Savannah River Site, South Carolina, on January 15, 1993.

A listing of all NPL-listed DOE facilities and the date upon which an IAG was reached or is projected is shown in Table II-1. Specific details concerning IAGs for each NPL-listed DOE facility, including budgetary proposals for FY 93 and FY 94, are discussed in Section II.H. of this report.

**TABLE II-1. PROGRESS IN REACHING INTERAGENCY AGREEMENTS AT
U.S. DEPARTMENT OF ENERGY FACILITIES LISTED ON THE NPL**

Site Name	Actual Date (Year) of Agreement
Brookhaven National Laboratory	1992
Fernald Environmental Management Project ¹	1990, 1991 ²
Hanford Site (4 separate sites)	1989, 1991 ² , 1992 ²
Idaho National Engineering Laboratory	1991
Lawrence Livermore National Laboratory - Main Site	1988
Lawrence Livermore National Laboratory - Site 300	1992
Maywood Site	1991
Monticello Mill Site	1988
Monticello Vicinity Properties	1988
Mound Plant	1990 ³
Oak Ridge Reservation	1992
Rocky Flats Plant	1991
Ross Complex	1990
Savannah River Site	1993
St. Louis Site	1990
Wayne Site	1991
Weldon Spring Site Remedial Action Project	1986, 1992 ²³

¹ Formerly known as Feed Materials Production Center

² Amended IAG

³ Agreement currently being renegotiated to include State as party.

B. Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Estimated cost information for FY 93 and FY 94 is presented in Section II.H for DOE facilities on the NPL where an IAG has been executed, and a ROD has been signed (for operable units

within the site and not for the site as a whole), or a cleanup action (e.g., CERCLA removal or remedial action) has been initiated under an IAG. In all cases, as of April, 1993, the cost estimates are equivalent to the identified budgetary proposals. These facilities are:

- Brookhaven National Laboratory, New York;
- Fernald Environmental Management Project, Ohio;
- Hanford Site, Washington;
- Idaho National Engineering Laboratory, Idaho;
- Lawrence Livermore National Laboratory - Main Site, California;
- Lawrence Livermore National Laboratory - Site 300, California;
- Maywood Site, New Jersey;
- Monticello Mill Site, Utah;
- Monticello Vicinity Properties, Utah;
- Oak Ridge Reservation, Tennessee;
- Rocky Flats Plant, Colorado;
- Ross Complex, Washington;
- Savannah River Site, South Carolina;
- Wayne Site, New Jersey; and
- Weldon Spring Site Remedial Action Project, Missouri.

Estimated FY 93 and FY 94 estimated cost figures for environmental restoration are presented for these facilities in Section II.H are consistent with DOE's current FY 94 Congressional Budget. Additional planning estimates of environmental restoration costs for FY 95 and beyond are contained in the Department's Five-Year Plan for Environmental Restoration and Waste Management, which is updated annually.

Actual expenditures for environmental restoration work in FY 92 are also provided for NPL DOE facilities (Section II.H) as well as for select facilities not listed on the NPL (Section II.I)

C. Public Comments Regarding Proposed Interagency Agreements

During Calendar Year 1992, four proposed IAGs were made available for public comment. Comments received on IAGs are summarized below. Additional details on public comments are provided in Section II.H.

- Brookhaven National Laboratory - No comments were received during a 45-day public comment period which ended May 4, 1992.
- Lawrence Livermore National Laboratory - Site 300 - No comments received during the public comment period.
- Savannah River Site - Public comments focused on five major areas: 1) Specific roles of the South Carolina Department of Health and Environmental Control (SCDHEC) and EPA Region IV in maintaining and enforcing DOE cleanup actions through funding and milestones; 2) Outyear (FY + 2 years) milestones are "cornerstones" of agreements that EPA Region IV insists that every Savannah River Site (SRS) action include. Outyear (FY + 2) milestones are also required to be presented by DOE Headquarters to Congress in budget requests to ensure adequate appropriated funding; 3) Public comment stated the FFA should not limit SCDHEC RCRA authority. The FFA was revised so that EPA Region IV does not have final dispute resolution authority over RCRA sites not covered by CERCLA. However, the SRS RCRA regulated units are still subject to CERCLA provisions; 4) Comments indicated the need to revise the SRS system of prioritizing waste units. The FFA was revised to include a priority system recommended and adopted by EPA; and 5) Comments request was addressed in the revised Public Involvement Plan.
- Weldon Spring Site Remedial Action Project - No comments were received during a 45-day public comment period which ended in May, 1992.

D. Instances in Which No Agreement Was Reached

Agreements were reached in each case where IAG negotiations were conducted in FY 92. As noted in Section II.A of this report, final IAGs were executed at 17 DOE sites during the past five years. Five of these agreements were reached in FY 92. An additional agreement was reached in Calendar Year 1993, during preparation of this Report to Congress.

E. Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

CERCLA section 120(e)(1) specifies that RI/FS work must be initiated within six months following a site's listing on the NPL. RI/FS work was initiated within the statutory time frames at all 17 DOE facilities listed as final on the NPL.

A detailed summary of the status of RI/FS activities at facilities on the NPL is provided in Section II.H, however, some highlights of accomplishments during Calendar Year 1992 are discussed briefly below:

- Brookhaven National Laboratory - RI/FS Schedule was submitted addressing 24 areas of concern and one RI/FS Work Plan was approved.
- Fernald Environmental Management Project - RI/FSs are underway for all operable units (OUs).
- Hanford Site - Three RI/FS work plans were submitted; 13 RI/FS work plans were approved; one RI Phase I Report and one RI Phase II Report were submitted; and one FS Phase I, one FS Phase II, and one FS Phase III Reports were submitted to the regulators. The RI Phase I focused on defining the nature and extent of contamination through field sampling and laboratory analysis, including characterization of waste types, migration routes, volume, and concentration ranges. This information will be used to further develop cleanup requirements. The RI Phase II focused on collecting data sufficient to substantiate a decision for remedy selection. A supplemental work plan to the RI/FS work plan will be prepared to cover the RI Phase II activities. The FS Phase I was conducted for the purpose of developing of array of alternatives to be considered for each OU. The FS Phase II was a screening step to reduce the number of treatment alternatives for further alternatives for further analysis while reserving a range of options. The FS Phase III analyzed treatment alternatives passing through the initial screening phases in further detail against a range of factors. The actual schedule for conducting the FS Phase III will be specified for each OU in the work schedule upon approval by the regulators.
- Idaho National Engineering Laboratory - RI/FSs activities are complete or underway at eight of the ten Waste Area Groups (WAGs).
- Lawrence Livermore National Laboratory - Main Site - One final ROD signed June, 1992.
- Maywood Site - One RI Report was completed and one Draft FS-Environmental Impact Statement (EIS) was submitted to regulators.

- Monticello Mill Site and Vicinity Properties - One RI/FS work plan was approved and one RI was initiated.
- Mound Plant - RI/FS activities are underway at each of the seven OUs.
- Oak Ridge Reservation - Seven RI work plans, six Interim Remedial Action Plans, three RI Reports, two RI/FS Reports, two FS Reports, one Interim Remedial Measures Study, and one Remedial Action Plan were submitted to regulators.
- Rocky Flats Plant - Seven final RCRA Facility Investigation (RFI)/RI work plans and three RFI/RI draft work plans were completed; one RFI/RI work plan was approved and work initiated; two RI reports were submitted and a FS was begun.
- Ross Complex - Field work for Phase II of the RI was completed; two draft RIs, and a single FS, as well as a Draft Proposed Plan were issued.
- Savannah River Site - 23 RFI/RI plans and three proposed RFI/RI plans were submitted to regulators.
- St. Louis Site - One RI was submitted and approved by EPA.
- Wayne Site - Analytical results in support of the RI were obtained.
- Weldon Spring Site Remedial Action Project - One RI/FS was completed and documents comprising the Draft RI/FS-EIS were completed.

F. Progress in Conducting Remedial Actions at NPL Sites

CERCLA section 120(e)(2) requires that substantial continuous physical on-site remedial action be convened at each facility not later than 15 months after completion of investigation and study. During Calendar Year 1992, one final ROD at Lawrence Livermore - Main Site was approved. At Idaho National Engineering Laboratory, four Interim Action RODs were signed, three final RODs were signed, and one Interim Action ROD was submitted for review and comment. One final ROD and one Interim Action ROD at the Oak Ridge Reservation was signed. In addition, during the first months of Calendar Year 1993, three Interim Action RODs received regulatory approval at the Savannah River Site. A draft ROD was issued for comment for the Ross Complex. In addition to remedial action activities, numerous response actions have been taken during Calendar Year 1992. These actions were primarily removal actions or interim actions and were designed to provide prompt or immediate response to actual or potential threats of a release of hazardous substances to the environment. A brief

summary of highlights resulting from response actions undertaken in Calendar Year 1992 at NPL DOE facilities includes:

- **Brookhaven National Laboratory** - Four removal actions have been planned or are currently under way.
- **Fernald Environmental Management Project** - Four removal actions were completed in 1992.
- **Hanford Site** - Two Expedited Response Actions (ERAs) were completed and project plans for six new ERAs, were completed and submitted to regulators.
- **Idaho National Engineering Laboratory** - Removal of 21 out-of-service petroleum tanks was undertaken.
- **Lawrence Livermore National Laboratory - Site 300** - An interim groundwater facility in the Central General Services Area (GSA) began operations; a second groundwater treatment facility underway at the Eastern GSA.
- **Monticello Mill Site and Vicinity Properties** - At the Mill Site, installation of surface water drainage control structures and construction of decontamination facilities, office buildings, and site haul roads have commenced. Remedial actions were completed for 89 of the 410 vicinity properties in FY 92. A total of 194 actions have been completed.
- **Oak Ridge Reservation** - Construction of a cap over a disposal site and removal of mercury from tank area were completed.
- **Rocky Flats Plants** - Installation of French drains and 11 monitoring wells were completed at OU1. A radionuclide Removal System was installed and completed at OU2.
- **Ross Complex** - Excavation and disposal of surface soils at seven individual waste units within OU A.
- **Savannah River Site** - One hazardous waste management facility was closed in Calendar Year 1992. Groundwater corrective action activity is ongoing at one hazardous waste management facility.
- **Weldon Spring Site Remedial Action Project** - A quarry water treatment plant building and interior construction complete with clean water testing are underway. Engineering was completed and construction began for quarry bulk waste site preparation. Quarry

haul road construction was completed. Construction of a new St. Charles County Water tower was completed.

Additional information on cleanup initiatives undertaken at DOE NPL facilities is provided in the detailed narratives found in Section II. H. of this report.

G. Progress in Conducting Remedial Actions at Facilities Not on the NPL

CERCLA and DOE Order 5400.4 requires that DOE respond to releases and potentially imminent releases of hazardous substances from its facilities. This response shall be in accordance with the requirements of CERCLA (as amended), the NCP, and Executive Order 12580. DOE's response includes both removal and/or remedial actions as appropriate from releases regardless of whether the facility is listed on the NPL. During Calendar Year 1992, various cleanup-related activities took place at DOE facilities not on the NPL under CERCLA and other authorities (e.g., TSCA and RCRA) and various State cleanup authorities. These activities include initiation of investigations and assessments to determine the nature and extent of past waste disposal practices, development of plans and reports necessary for implementing cleanup activities, and, continued operation and maintenance of existing remediation actions. These activities were undertaken at non-NPL facilities identified in this report. Where significant environmental restoration activities are underway, detailed narratives on the nature of these remediation initiatives is provided for the non-NPL facilities presented in Section II.I. For non-NPL facilities that do not have narratives in the aforementioned section, brief highlights concerning relevant plans and scheduling information for activities undertaken at each of these facilities is provided in Table III-1 of this report. Table III-1 provides a comprehensive state-by-state listing of all NPL and non-NPL DOE facilities found on the Docket (Update #7).

H. Individual Narratives for Facilities on the NPL

This section of the Annual Report provides a detailed description of progress made at each of the 17 DOE facilities currently on the NPL. The information provided includes each facility's NPL status, background summary information, environmental conditions, funding information, and address each of the applicable CERCLA section 120(e)(5) information requirements. The locations of these sites are shown in Figure II-1. These 17 NPL listed DOE facilities are also highlighted in Table III-1 of Section III.

FIGURE II-1
U.S. DEPARTMENT OF ENERGY FACILITIES ON THE NATIONAL
PRIORITY LIST (NPL)

BROOKHAVEN NATIONAL LABORATORY

Upton, New York

Field Office: DOE Field Office, Chicago

Size: 5,300 acres

NPL Status: Placed on the NPL on November 21, 1989.

Mission: Historically, the site was used by the U.S. Army as a post (called Camp Upton) during the First and Second World Wars. The Atomic Energy Commission was given title to the property in 1947 and subsequently transferred it to the Energy Research and Development Administration in 1975, which became DOE in 1977.

Brookhaven National Laboratory functions as a design, construction, and operations center for large research facilities such as particle accelerators, nuclear reactors and synchrotron storage rings for research in high-energy and nuclear physics, chemistry, biology and energy-related life and environmental sciences.

**Overview of
Environmental
Conditions:**

On-site groundwater and soil contamination.

Funding in FY 92: \$5,414,000

Progress in Reaching Interagency Agreement

DOE, EPA Region II, and the State of New York executed the IAG for Brookhaven National Laboratory on February 28, 1992. The effective date of the agreement was May 27, 1992. The IAG integrates both corrective action requirements under RCRA and response action requirements under CERCLA.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG at the Brookhaven National Laboratory, according to the FY 94 Congressional Budget, total \$5.9 million for FY 93 and \$11 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No comments were received during a 45-day public comment period which ended May 4, 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The CERCLA Response Strategy Document currently divides 24 areas of concern at the Brookhaven National Laboratory into seven Operable Units (OUs); each OU will undergo an RI/FS. The FY 93 schedules for the various RI/FSs were submitted to EPA Region II and the State of New York on December 14, 1992 and subsequently accepted. Two newly identified areas of concern, buildings 479 and 208, are proposed for addition to the upcoming revised response strategy document.

The RI/FS Work Plan for OU IV (Central Steam Facility) was approved by DOE and EPA Region II/State of New York. Field work is now well underway and expected to be completed by the end of August, 1993. The OUs (Landfill and Hazardous Waste Management Facility) RI/FS Workplan will be submitted to DOE EPA Region II and the State of New York in 1993 and field work will begin in late 1993.

The Solid Waste Management Unit (SWMU) Classification Report was submitted to EPA Region II and the State of New York on November 7, 1991. This report categorizes SWMUs at Brookhaven National Laboratory to be either "No-Action" or "Action." Action SWMUs become areas of concern to be addressed under the IAG. Response actions under the IAG will satisfy RCRA and State of New York corrective action requirements. The Site Baseline Report was submitted to EPA and the State of New York in January 1992. This report summarizes existing information on past disposal practices, construction details, and environmental monitoring data. The historical site review consists of a review of existing files, serial photographs, and records from the Army and various levels of government agencies. The review started with a preliminary review of aerial photographs in May 1992, performance of Phase I review between August to November 1992, and initiation of Phase II review on January 14, 1993. The historical site review is anticipated to be completed on August 1, 1993.

Progress in Conducting Remedial Actions at NPL Sites

Five removal actions (Cesspools, Underground Storage Tanks, 'D' Tanks, Spray Aeration Groundwater Remediation, and the landfill capping project under OU I) are planned or underway. Final remedial actions will be initiated following the completion of RI/FSs and the selection of remedies. Remedy selections will be documented in RODs.

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald, Ohio

Field Office:	Fernald Environmental Management Project
Size:	1,050 acres
NPL Status:	Placed on the NPL on November 21, 1989.
Mission:	The Fernald Environmental Management Project (FEMP), formerly the Feed Materials Production Center, was constructed in the early 1950s, and was used to produce uranium metal products for use by the Government. Production was suspended in July, 1989. The site was placed under EM effective October 1, 1990.
Overview of Environmental Conditions:	Soil and groundwater contamination by radionuclides above background levels both on-site and in adjacent off-site areas. Release of radon and the retention of large quantities of low-level radioactive and mixed wastes in on-site storage areas are also of significant concern.
Funding in FY 92:	\$211,402,000

Progress in Reaching Interagency Agreement

At the time when FEMP was placed on the NPL, the site was engaged in activities aimed at compliance with the terms of an existing Federal Facility Compliance Agreement signed on July 19, 1986 between DOE and EPA Region V. The CERCLA portion of the Federal Facility Compliance Agreement was replaced by the signing of a Consent Agreement (an IAG) with EPA on April 9, 1990, which became effective on June 29, 1990. The IAG provides for the execution of RI/FSs for five OUs and the performance of removal and remedial actions at the facility. DOE and EPA signed an Amended Consent Agreement which was executed on September 20, 1991. The amended IAG revised the milestones for submittal of RI/FS documents to EPA and expanded the scope of the RI/FS to the former production area. The Amended Consent Agreement was modified in April, 1993 as a result of an informal settlement concerning OU 2 schedules. For more information regarding the FEMP IAG and the pre-1993 referenced amendment, see the FY 90 and FY 91 CERCLA 120 Reports, respectively.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the Amended IAG at the FEMP, according to the FY 94 Congressional Budget, total \$292.5 million for FY 93 and \$298.7 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The RI/FS process at the FEMP was initiated in July, 1986 under the provisions of a 1986 Federal Facility Compliance Agreement. The 1990 CERCLA 120 and 106 Consent Agreement amended the CERCLA portion of the 1986 agreement and restructured the ongoing investigations into five distinct OUs. The 1991 Amended Consent Agreement revised the milestones for submittal of RI/FS documentation to EPA for five OUs. Separate RI/FS reports and RODs are planned to be issued for each of the OUs. Additionally, the Amended IAG established milestone dates for the submittal of select documents addressing all five OUs and a Final combined site-wide OU. Progress in completing the RI/FS for each of the five OUs as defined under the provisions of the Amended Consent Agreement (as modified in April, 1993) is summarized below.

Affecting all OUs

The Amended IAG provided for the submittal of a Risk Assessment Work Plan to establish the specific approach, parameters, and models to be employed to conduct OU Baseline and FS Risk Assessments. Approval of this work plan was received from EPA in May, 1992. A Site-wide Characterization Report, required by the agreement, providing a preliminary Site-wide baseline assessment was transmitted to EPA in August, 1992. This report is currently being finalized. A Site-wide CERCLA Quality Assurance Plan pertaining to all facility sampling and analysis was approved by EPA in September, 1992. This plan integrates DOE and U.S. EPA quality assurance policies and principles.

OU 1: Waste Storage Area

This OU comprises the existing six FEMP waste storage pits, the clearwell, the burnpit, berms, liners, and soil within the OU boundary. The Final Initial Screening of Alternatives Report was approved by EPA in January, 1991, defining five potential alternatives for addressing the final disposition of the stored waste inventories. Field investigations including the completion of thirteen borings/wells into the waste storage units and associated laboratory analysis was completed in February, 1992. RI Report preparation continued with the report scheduled for issuance to EPA in October, 1993. A Treatability Study Work Plan for OU1 was approved by EPA in November, 1991. Treatability studies continued during FY 92, with results to be factored into the FS Report scheduled for submittal to EPA in April, 1994. The ROD for the OU is scheduled for submittal to EPA in December, 1994.

OU 2: Other Waste Units

This OU comprises the FEMP solid waste landfill, water treatment lime sludge ponds, fly ash piles, and south field area. Site investigation activities within this unit included the completion

of geophysical surveys, collection of representative waste, and leachate samples from each waste unit and the completion of over 25 wells in the vicinity of the waste units.

The draft RI report was submitted to EPA and Ohio in October 1992. This document was disapproved by EPA in December, 1992; under the April, 1993 modification, the RI report will be resubmitted to EPA in February, 1994. In December the regulators disapproved the report, pending the incorporation of comments. In February 1993 DOE proposed schedule extensions to accommodate the additional field sampling necessary to address the comments. The proposal was rejected. Through the informal dispute resolution process set forth in the Amended Consent Agreement, the DOE and EPA, in consultation with the State, reached an agreement in April 1993.

The informal dispute resolution agreement establishes the following schedules for OU 2 documents: the proposed ROD for OU 2 is scheduled to be submitted to EPA in January 1995. In addition, the agreement requires that the DOE expend at least \$2.0 million for a supplemental environmental project (with the objective of reducing the total uranium discharged to the Great Miami River); reduce the ROD milestone schedules for OUs 1, 3, and 5 by 30 days; and pay a monetary penalty of \$50,000, with a stipulation that an additional monetary penalty of \$25,000 be paid only in the event that the revised OU 2 ROD milestone is not met. DOE also committed to review the adequacy of data for all future Remedial Investigation Reports for the remaining OUs in order to prevent a situation such as this from recurring.

OU 3: Production Area and Production Associated Facilities

This OU comprises the FEMP former Production Area and production-associated facilities and equipment (including all above- and below-grade improvements) including but not limited to all structures, equipment, utilities, drums, tanks, solid waste, waste products, thorium, effluent lines, K-65 transfer line, wastewater treatment facilities, fire training facilities, scrap metal piles, feed stock and coal piles. An addendum to the RI/FS Work Plan was submitted to EPA in December, 1992, defining the scope of required site investigations to support OU3. The Initial Screening of Alternatives report is scheduled for submittal to EPA in March, 1995, the RI Report in March, 1996, the FS Report in August, 1996. Under the April, 1993 modification, the ROD is scheduled for submittal to EPA in April, 1997.

OU 4: Silos 1, 2, 3 and 4

This OU comprises the four waste storage silos located in the FEMP waste storage area. The Initial Screening of Alternatives Report was approved by EPA in October, 1990. The draft RI Report was submitted to EPA for approval in April, 1993. Treatability studies have also been initiated and the results will be factored into the FS Report scheduled for submittal to EPA in September, 1993. The ROD for this OU is scheduled for submittal to EPA in June, 1994.

OU 5: Environmental Media

This OU comprises groundwater, surface water, soil, sediments, and flora and fauna in the vicinity of the FEMP not included in the definition of OUs 1 to 4. The Initial Screening of Alternatives Report was submitted to EPA in November, 1992 and conditionally approved in January, 1993. EPA comments were incorporated and the Initial Screening of Alternatives Report was submitted to EPA in March, 1993. A Treatability Study Work Plan was approved by EPA in September, 1992. Treatability studies were initiated in August, 1992. The RI

Report is scheduled for submittal in June, 1994, the FS Report in November, 1994, and the ROD in August, 1995.

Progress in Conducting Remedial Actions at NPL Sites

Current site activities focus on completion of the RI/FSs. Final remedial actions will be initiated following completion of the RI/FSs and signing of RODs. Several removal actions, however, are planned or under way. Consistent with the Amended Consent Agreement, twenty-seven specific removal actions were identified as part of the amended FFA and are in various stages.

Removal Actions

Removal activities conducted during 1992 and early 1993 are summarized on the following table.

FEMP REMOVAL ACTIONS

Removal No	Name	Activities During 1992/1993
2	Waste Pit Area Run-Off Control	This removal action included the collection of stormwater run-off from the FEMP waste pit area, and the redirection of these flows to existing wastewater treatment facilities. This removal action was completed ahead of schedule in June, 1992.
3	South Groundwater Contamination Plume	The purpose of this removal action is to protect public health by limiting access to and use of the groundwater contamination plume, and to control plume migration. An Engineering Evaluation/Cost Analysis (EE/CA) was submitted to EPA. Formal approval of the EE/CA was received from EPA on September 4, 1990. An addendum to the EE/CA was approved by EPA in November, 1991. A revised schedule for this removal action was approved by EPA in December, 1991. Part 1 was completed in December, 1992. Part 2 is scheduled for completion in August, 1993. Part 3 was completed in July, 1992. Parts 4 and 5 have no scheduled completion dates.
9 *	Removal of Waste Inventories	FEMP procedures for the Removal of Waste Inventories were submitted to EPA in August, 1991. These procedures detail the methods used in packaging and shipment of low-level waste, including thorium from the FEMP. Update procedures were approved by EPA in October, 1992. Removal No. 9 will continue through issuance of the OU3 ROD.

Removal No	Name	Activities During 1992/1993
11 *	Pit 5 Experimental Treatment Facility	The objective of this Removal Action is to decontaminate and remove the Pit 5 Experimental Treatment Facility. The Work Plan for this Removal Action was submitted to EPA in October, 1991 and approved by EPA in March, 1992. Removal of the facility was completed ahead of schedule in March, 1992.
12 *	Safe Shutdown	Safe Shutdown procedures were submitted to EPA on October 30, 1991. Updated procedures were approved by EPA in October, 1992. These procedures detail the methods to be used to place the former production facilities at the FEMP into a safe and permanent shutdown configuration. A Categorical Exclusion has been initiated and specific work is scheduled to commence in May, 1993.
14 *	Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator	The objective of this Removal Action is to identify and possibly remove contaminated soils near the Sewage Treatment Plant Incinerator. The Removal Action Work Plan was approved by EPA in May, 1992. Progressive site activities identified significantly larger volumes of contaminated materials than originally planned. A Work Plan addendum addressing these changed site conditions was submitted to EPA in January, 1993.
15 *	Scrap Metal Piles	The objective of this Removal Action is to contract for metals decontamination and subsequently reuse, recycle, or dispose of existing FEMP Scrap Metal Piles. The Removal Action Work Plan was approved by EPA in May, 1992.
16 *	Collect Uncontrolled Production Area Run-off-Northeast	The objective of this Removal Action is to collect all remaining uncontrolled stormwater run-off from the former FEMP production area and divert it into the existing stormwater retention basin. The Removal Action Work Plan was approved by EPA in July, 1992. Construction activities are expected to be completed by August, 1993.
17 *	Improved Storage of Soil and Debris	The objective of this Removal Action is to improve the soil and debris storage locations at the site by providing run-off controls and covered structures. The Removal Action Work Plan was approved by EPA in October, 1992.
18 *	Control Exposed Material in Pit 5	The objective of this Removal Action is to control or mitigate any potential fugitive dust emissions from Pit 5 by covering all material in the pit. The Removal Action Work Plan was approved by EPA in August, 1992. Field work was initiated in September, 1992 and was completed in December.

Removal No	Name	Activities During 1992/1993
19*	Decontamination and Dismantling of Plant 7	The objective of this removal action is to mitigate potential fugitive dust releases from Plant 7 by the decontamination and dismantling of the facility. The Removal Action Work Plan was submitted to EPA in April, 1993.
20*	Stabilization of Uranyl Nitrate Hexahydrate Inventories	The objective of this removal action is to process the FEMP inventory of 200,000 gallons of UNH into a solid non-leachable form. Processing was initiated in July, 1992 with completion projected for the first quarter of FY 94.
21*	Expedited Silo 3	The objective of this removal action is to mitigate potential releases from an out-of-service dust collector on the dome of Silo 3. The removal action was completed in January, 1992.
22*	Waste Pit Area Containment Improvement	The objective of this removal action is to improve necessary erosion control measures to mitigate releases to surface water and air from contaminated soils in the FEMP Waste Pit Area. The Removal Action Work Plan was approved by EPA in November, 1992. Field activities were initiated in October, 1992 in advance of EPA approval to gain benefit of available growing season. Construction activities were initiated in April, 1993.
23*	Inactive Fly Ash Pile	The objective of this removal action was to remove contaminated debris from three of the regulated areas identified in the field investigation. This activity was initiated on June 24, 1992 and the results were submitted on June, 29, 1992. It was determined that no further action is required until remediation.
24*	Removal of the Pilot Plant Sump	The objective of this removal action is to eliminate potential releases from the Pilot Plant Sump by clean-up and removal of the system. The Removal Action Work Plan was approved by EPA in November, 1992. Field implementation is scheduled to be complete in April, 1993.
25	Cleanup of Nitric Acid Tank Car and Surrounding Area	The objective of this removal action is to decontaminate an existing rail car containing nitric acid and address any adjacent soils contamination. The Removal Action Work Plan was submitted to EPA in October, 1992.
26	Asbestos Removals	The objective of this removal action is to mitigate the potential for fugitive releases of asbestos. A compendium of procedures supporting this removal action was submitted to EPA in May, 1992.

Removal No	Name	Activities During 1992/1993
27	Management of Contaminated Structures at the FEMP	The objective of this removal action is to mitigate the potential of contaminate releases from the FEMP structures. An EE/CA was submitted to EPA in December, 1992 for this removal action.
28	Stabilization of Thorium Nitrate	The proposed action was submitted to EPA in January, 1993.
29	Contamination at the Fire Training Facility	The proposed action was submitted to EPA in January, 1993.
30	Temporary Nitrate Storage Tanks	The proposed action was submitted to EPA in January, 1993.
No Number Assigned	Inactive Fly Ash Pile Erosion Control	The objective of this emergency response action is to mitigate the observable bank erosion that is taking place adjacent to Paddy's Run. Field work was initiated in April, 1993 and will be completed by the end of May, 1993.

* Removal actions conducted in 1992 as a result of the Amended Consent Agreement, executed on September 14, 1991.

Assessment of a Stipulated Penalty Against DOE

On December 16, 1992, EPA and the Ohio Environmental Protection Agency disapproved the draft RI Report for OU 2, pending the resolution of extensive comments. All parties agreed that additional field sampling was needed to adequately characterize OU 2 and to address the comments. The regulators held that while DOE had fulfilled the scope of the approved OU 2 Work Plan, and had conducted additional sampling, the objectives of the plan had not been met. DOE proposed revised schedules to accommodate the necessary sampling. The regulators determined that "good cause" did not exist for an extension.

During informal dispute resolution, an agreement was reached in early April 1993, which included the following provisions. OU 2 schedules are revised to reflect additional field sampling. RODs for three other OUs are each accelerated by one month. DOE will spend \$2 million on a supplemental environmental project intended to further reduce uranium releases to the Great Miami River. EPA assesses a \$50,000 stipulated penalty payable by DOE under the terms of the Amended Consent Agreement; if DOE misses the revised milestone for the OU 2 ROD, an additional \$25,000 stipulated penalty may be automatically assessed.

HANFORD SITE

Richland, Washington

Field Office:	DOE Field Office, Richland
Size:	359,680 acres (562 square miles)
NPL Status:	Placed on the NPL October 4, 1989 (Areas 100, 200, 300 and 1100).
Mission:	Chosen in 1943 for the Manhattan Project, the Hanford Site was used to produce plutonium for the world's first nuclear weapons. Today the focus of activities is site cleanup and environmental restoration; scientific and environmental research; development and application of rad waste and hazardous waste management technology; and the design, construction, and operation of major energy-related test and development facilities.
Overview of Environmental Conditions:	On-site soil, groundwater, and sediment contamination by various hazardous and radioactive substances. Low levels of radionuclides are also routinely identified in the Columbia River.
Funding in FY 92:	\$113,339,000

Progress in Reaching Interagency Agreements

DOE, EPA Region X, and the State of Washington negotiated and signed the Hanford Federal Facility Agreement and Consent Order (an IAG in the form of a TPA) on May 15, 1989. This IAG provides the framework for effective investigation of waste sites and subsequent remediation of hazardous and mixed waste contamination at Hanford. An Annual Update is prepared to address additional problems and to incorporate schedules agreed to in approved RI/FS work plans or other work scope agreed to by the three parties. Revision 2 of the IAG was published in September, 1992, which included the second and third amendments to the consent order. For detailed information regarding this interagency agreement, see the FY 91 CERCLA 120 Report.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG, according to the FY 94, Congressional Budget, total \$133.2 million for FY 93, and FY 94 total \$173.4 million.

Public Comments Regarding Proposed Interagency Agreements

Amendments and updates to the IAG are subject to Public Comment periods prior to signature by the three parties. For detailed information regarding the IAG comment process, see the FY 1991 CERCLA 120 Report. No significant comments were received on the annual update or the amendments that occurred in 1992. All future changes to the IAG will also be subjected to public review and comment.

Progress in Conducting the Remedial Investigations/Feasibility Studies at NPL Sites

The Hanford Site includes a broad range of waste units which are either radioactive, hazardous, mixed (both radioactive and hazardous), or non-radioactive/non-hazardous. Certain hazardous contaminants, and hazardous wastes remain on and under the Hanford Site and have been detected in ground water and surface water. An estimated five billion cubic yards of solid and dilute liquid waste, which includes hazardous substances, mixed waste, and hazardous waste and constituents, have been disposed of at the Hanford Site.

All remediation work at the Hanford Site is included within four NPL Sites and 74 source OUs, containing 1,135 identified hazardous waste sites, plus four groundwater OUs. OUs were prioritized by EPA and the State of Washington in 1989 for investigation based on an initial assessment of environmental risk potential. Under the original TPA, the OUs were to be investigated separately with a ROD for each OU.

The DOE Richland Field Office developed and negotiated the Hanford Site Past Practices Strategy in the September, 1991, changing the IAG. This strategy streamlined the past practice corrective action process and provided new concepts for accelerating decision-making by: 1) maximizing the use of existing data consistent with data quality objectives by developing an Aggregate Area Management Strategy; and 2) undertaking ERAs as needed to remove threats to human health and welfare and the environment.

The following activities were accomplished during Calendar Year 1992:

- Three RI/FS work plans were submitted to the regulators based upon the priority established in the IAG;
- 13 RI/FS work plans were approved by the regulators;
- Ten Aggregate Area Management Strategy Reports were issued to the regulators;
- The RI Phase II Report and FS III Report/Proposed Plan on the 1100-EM-1 OU were submitted;
- The RI Phase I Report and FS Phase I and II Report on the 300-FF-1 OU were submitted;
- Characterization and assessment activities were ongoing on 18 OUs; and
- Five ERAs have been initiated.

Six work plans are due to the regulators in FY 93. The Draft combined FS I, II, and III Report for the 200-BP-1 OU will be submitted to the regulators in May, 1994.

Other significant activities for 1992 include development of the Hanford Site Baseline Risk Assessment Methodology, NEPA/CERCLA, and RCRA/CERCLA Integration approaches, a strategy for handling investigation derived waste, and completion of the Schedule Optimization Study.

Progress in Conducting Remedial Actions at NPL Sites

Under the Hanford Site Past Practice Strategy, sites are identified which pose threats to human health and welfare and the environment. These sites are considered for ERAs. The following ERA activities were accomplished during Calendar Year 1992:

- The 618-9 Burial Ground ERA was completed in October, 1992. 1,600 gallons of flammable solvent, 21 55-gallon drums of soil, 1 55-gallon drum of solid mixed waste and 18 boxes of low-level radioactive waste were disposed of in appropriate facilities.
- The 300 Area Process Trenches ERA (located in the 300-FF-1 OU) were completed in 1991, and the final report was submitted to the regulators in July 1992.
- 200 West Area carbon tetrachloride treatment site (located in the 200-ZP-1 OU) successfully completed a vapor extraction demonstration, and full scale equipment acquisition is currently underway. The amount of carbon tetrachloride discharged to the soil is estimated to be between 97,000 and 580,000 gallons.

DOE and EPA Region X agreed on six new ERAs in 1992. Project Plans have been completed and sent to EPA for approval. They include:

- The Sodium Dichromate Burial Ground ERA is located east of the OR reactor (near the Columbia River). The burial ground was used in 1954 for disposal of discarded and crushed barrels, believed to have contained residual amounts of sodium dichromate. Public comments on the ERA proposal are being incorporated, and non-intrusive field work has begun.
- The North Slope ERA covers about 134 square miles on the northern and eastern borders of the Hanford Site, north of the Columbia River. The area contained anti-aircraft guns, Nike missile emplacements, and landfills. It also contains a small landfill used by the U.S. Bureau of Reclamation to dispose of soil and storage tanks contaminated with the herbicide 2,4-D. Non-intrusive field work, landfill sampling, and a concrete grease rack demolition have been completed.
- The Pickling Acid Crib (White Bluffs Pickling) ERA is located south of the old White Bluffs town site. The cribs were used for disposal of acids from pipe cleaning operations during the construction of Hanford's reactors. The acids were used to "pickle" or clean galvanized pipes. Non-intrusive field work and sampling have been completed.

- The Riverland ERA is located in the northwest corner of the Hanford Site. The site was used from 1943 to 1957 to maintain, clean and decontaminate rail cars. Non-intrusive field work and sampling have been completed.
- The 618-11 Burial Ground ERA is located adjacent to a commercial reactor operated by the Washington Public Power Supply System. It contains high activity and trans-uranic wastes buried between 1962 and 1967. Wastes were disposed of in caissons, pipes, and trenches. Preliminary review of historical data has been completed and a draft characterization report has been prepared.
- The N-Springs ERA is located near the N-Reactor. Past liquid effluent discharges have led to radionuclide releases to the Columbia River. The area along the southern bank of the Columbia river were the contaminated groundwater discharges into the river is known as N-Springs. The principal radionuclides in the groundwater reaching the river is strontium-90.

1992 was a transition year as the Environmental Restoration Program at Hanford moved from the previous RI/FS process to the Hanford Site Past Practices Strategy approach. In accordance with the IAG, the plan is to complete RI/FSs for all the waste units by the 2005 and complete all remedial or corrective actions by the year 2018.

Final Assessment of a Stipulated Penalty Against DOE

In October, 1990, DOE stopped construction of the low-level mixed waste analytical laboratory (Milestone M-14-00), in order to review options for obtaining laboratory analytical services from commercial laboratories; DOE subsequently resumed construction of a smaller laboratory. In October, 1991, DOE submitted a request to change Milestone M-14-00 from construction of a laboratory to assurance of adequate laboratory capacity for mixed waste samples under the IAG. This request was denied by EPA and the State of Washington in November, 1991, and DOE initiated dispute resolution under the IAG. In April, 1992, the Senior Executive Committee (SEC) agreed on a proposal to resolve the issue. Based on public comment, the State required further changes to the agreement to mandate that analytical laboratory services be acquired in the vicinity of Hanford.

The SEC dispute resolution agreement signed in January, 1993 includes the following provisions. DOE will exercise best efforts to award a contract(s) by July, 1993, to provide laboratory capacity to meet the IAG sampling and analysis requirements; milestones will be set in the IAG leading to an October, 1995, operation date. The down-sized onsite laboratory currently under construction will be used primarily for quality control of DOE and commercial laboratories and low-level process-control analysis. DOE must comply with the analytical turnaround times (existing or modified) in the IAG. DOE will perform an ERA of the N-Springs and establish IAG milestones for completion, and commits to seek funding in FY 94 and beyond, to complete existing (approved) ERAs and the N-Springs response action. DOE acknowledged that it failed to seek formal approval from the regulators before modifying compliance with Milestone M-14-00. EPA assessed a stipulated penalty of \$100,000 payable by DOE under the terms of the IAG. EPA and the State of Washington will not seek additional penalties for violations to date of M-14-00 and the IAG's stipulated analytical turnaround times if DOE meets the terms of the resolution agreement.

IDAHO NATIONAL ENGINEERING LABORATORY

Idaho Falls, Idaho

Field Office: DOE Field Office, Idaho

Size: 569,600 acres (890 square miles)

NPL Status: Placed on the NPL on November 21, 1989.

Mission: The Idaho National Engineering Laboratory (INEL) was established in 1949 by the U.S. Atomic Energy Commission as an area to build, test, and operate various nuclear reactors, fuel processing plants, and support facilities with maximum safety and isolation. Originally known as the National Reactor Testing Station, the site was renamed as the INEL in 1974 to reflect the broad scope of engineering activities now conducted at the site. Prior to its establishment, the site was used as a World War II gunnery range for the U.S. Navy and U.S. Army Air Corps.

**Overview of
Environmental
Conditions:**

On-site groundwater and soil contamination from both known and potential sources resulting from past disposal practices. Contaminants of concern include chromium, volatile organic compounds (VOCs), carbon tetrachloride, and plutonium.

Funding in FY 92: \$52,761,000

Progress in Reaching Interagency Agreement

The INEL IAG (a Federal Facility Agreement/Consent Order or FFA/CO) and Action Plan between DOE, EPA Region X, and the State of Idaho was executed on December 9, 1991. The IAG supersedes the RCRA 3008(h) Consent Order and Compliance Agreement (COCA) and covers all CERCLA response requirements as well as RCRA corrective action requirements. All parties agreed to initiate the IAG Action Plan under the COCA in September, 1991 while the FFA/CO was being finalized.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG Action Plan at the INEL, according to the FY 94 Congressional Budget, total \$78.3 million for FY 93 and \$82.8 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG has occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Under the IAG, OUs have been defined such that all known solid or hazardous waste units will be appropriately addressed. To facilitate environmental remediation efforts, the site was divided into 10 WAGs, which generally correspond to major DOE-INEL operational facilities. Previous identification of releases at three facilities had led to the NPL listing in 1989. The three facilities are Test Area North (WAG-1), Test Reactors Area (WAG-2), and Radioactive Waste Management Complex (WAG-7).

WAG-10 was established to encompass the Snake River Plain aquifer and all activities that affect groundwater on a regional scale, and includes all sites that are outside of the facility-specific WAGs.

The following documents were developed and submitted to the EPA and State of Idaho during Calendar Year 1992:

- Draft RI/FS Workplan for WAG-1 (Test Area North) Groundwater (OU 1-07b);
- Draft RI/FS for WAG-2 (Test Reactor Area) Perched Water, (OU 2-12);
- Draft Final RI for WAG-4 (Central Facilities Area) Motor Pool Pond (OU 4--11);
- Draft RI/FS Statement of Work (SOW) and Workplan for WAG-4 Landfills (OU 4-12);
- Draft RI for WAG-5 (Auxiliary Reactor Area) Chemical Pond (OU 5-10);
- Draft RI/FS for WAG-7 (Radioactive Waste Management Complex) Pad A (OU 7-12);
- Draft RI/FS Workplan for WAG-7 Organic Contamination in the Vadose Zone (OU 7-08); and
- Draft RI/FS Workplan for WAG-8 (Naval Reactor Facility) Industrial Waste Ditch (OU 8-07).

Progress in Conducting Remedial Actions at NPL Sites

The following activities were accomplished for Calendar Year 1992:

- The Interim Action ROD for WAG-1 Groundwater was submitted and signed (OU 1-07A);
- The Interim Action ROD for WAG-2 (Test Reactor Area) Warm Waste Pond was submitted and signed (OU 2-05);

- The ROD for WAG-2 Perched Water RI/FS was submitted and the ROD was signed (OU 2-12);
- The ROD for WAG-4 (Central Facilities Area) Motor Pool Pond was submitted and signed (OU 4-11);
- The Interim Action ROD for WAG-5 (Power Burst Facility) was submitted and signed (OU 5-13);
- The ROD for WAG--5 (Auxiliary Reactor Area Cemical Pond) was submitted and signe (OU 5-10);
- The Interim Action ROD for WAG-7 (Radioactive Waste Management Complex) Pit 9 Comprehensive Demonstration was submitted (OU 7-10);
- The Interim Action ROD for WAG-10 Ordnance Remediation was submitted and signed (OU 10-05);
- 21 out-of-service petroleum tanks were removed (57.7 tons of metal and 80,000 gallons of product were recycled).
- The Pilot Plant Report for the WAG-2 Warm Waste Pond was submitted;
- The Preliminary/Prefinal Design for the WAG-10 Ordnance Remediation was submitted;
- Remedial Action Workplan for the WAG-10 Ordnance Remediation was submitted; and
- 57 No Further Action Determinations were approved.

LAWRENCE LIVERMORE NATIONAL LABORATORY - MAIN SITE

Livermore, California

Field Office: DOE Field Office, San Francisco

Size: 811 acres (Livermore, California)

NPL Status: Placed on the NPL on July 22, 1987.

Mission: The Lawrence Livermore National Laboratory (LLNL) was established in 1952 to function as a national scientific and technical resource for the nuclear weapons program and other programs of national interest. LLNL performs research, development, and testing associated with the nuclear design aspects of all phases of the nuclear weapon life cycle. The Laboratory, consisting of two noncontiguous parcels, is also involved in the following programs: inertial fusion; magnetic fusion; biomedical and environmental research; isotope separation; and applied energy technology and other research-related activities.

**Overview of
Environmental
Conditions:**

Contamination of groundwater and soil with tetrachloroethylene and trichloroethylene.

Funding in FY 92: \$16,195,000

Progress in Reaching Interagency Agreement

DOE entered into an IAG with EPA Region IX and the State of California for an RI/FS and cleanup of the LLNL - Main Site. This IAG was executed on November 1, 1988 and became effective in February, 1989.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG at the LLNL-Main Site, according to the FY 94 Congressional Budget, total \$18.1 million for FY 93 and \$18.9 million, for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG has occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The draft final FS was submitted to the state and EPA in December, 1990 and the Proposed Remedial Action Plan was submitted in October, 1991, in preparation for the November, 1991 public hearing for the Proposed Remedial Action Plan for on-site remediation activities. A Responsiveness Summary for the public comments and final ROD was approved by DOE in July, 1992.

Progress in Conducting Remedial Actions at NPL Sites

The ROD for the LLNL-Main Site was approved by DOE, EPA, and the State of California in June, 1992. The ROD called for clean up of soil and groundwater using seven treatment facilities and 24 initial extraction locations. Two of the treatment facilities are operational with two additional facilities beginning operation by the end of FY 93.

The Draft Remedial Action Implementation Plan was submitted to the Regulatory Agencies in July, 1992; the Final Remedial Action Implementation plan (RAIP) was submitted in January, 1993. The draft Remedial Design Report No. 1 was submitted in October, 1992 and the Final report is scheduled to be submitted by the second quarter of FY 93., The Draft and Final Removal Design Report No. 2 will be completed by the third and fourth quarter of FY 93, respectively.

LAWRENCE LIVERMORE NATIONAL LABORATORY - SITE 300

Livermore, California

Field Office:	DOE Field Office, San Francisco
Size:	7,000 acres (Tracy, California)
NPL Status:	Placed on the NPL on August 30, 1990.
Mission:	The LLNL was established in 1952 to function as a national scientific and technical resource for the nuclear weapons program and other programs of national interest. LLNL performs research, development, and testing associated with the nuclear design aspects of all phases of the nuclear weapon life cycle. The Laboratory, consisting of two noncontiguous parcels, the Main Site and Site 300. Site 300 is used for high explosives testing.
Overview of Environmental Conditions:	Contamination of on-site groundwater and soil with tritium and trichloroethylene and high explosive compounds.
Funding in FY 92:	\$5,844,000

Progress in Reaching Interagency Agreement

An Interim Letter of Agreement was signed in October, 1990 for ER work at LLNL - Site 300 to ensure assessment and cleanup activities continued while the CERCLA IAG was negotiated. An integrated (CERCLA/RCRA) IAG was negotiated and signed between DOE, EPA Region IX, and two California state agencies on June 29, 1992.

Specific Cost Estimates and Budgetary Proposals Involving Each Interagency Agreement

Funds budgeted for ER under the IAG at the LLNL-Site 300, according to the FY 94 Congressional Budget total \$7.6 million for FY 93 and \$8.0 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No comments were received during a 60-day public comment period which ended in October, 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Under the Interim Letter of Agreement, preliminary RI/FSs were completed at five of six OUs at LLNL. Under the terms of the IAG and at the request of the regulatory agencies, a Site 300 Wide Remedial Investigation (SWRI) Report will be prepared. Under the original RI schedule, the RI was due in January, 1993, however, a revised schedule for the RI set a new milestone of August 9, 1993. In addition, EPA will accept a Proposed Plan instead of a Proposed Remedial Action Plan for each OU. This was agreed to under informal dispute resolution between DOE, EPA, and the State of California.

Based on the results of the SWRI, individual OU FSs will be prepared. The OUs under the IAG are: Building 834 Area, the GSA, the High Explosive Process Area, the Pit 6 Complex, East/West Firing Areas, and an "other miscellaneous areas of concern" OU including Building 833 and the dry wells.

Progress in Conducting Remedial Actions at NPL Sites

During FY 92 an interim ground water facility at the Eastern GSA was operated.

An interim ground water Treatment Facility was planned, constructed and underwent startup testing at the central GSA. Construction of RCRA caps was completed on Pits 1 and 7.

A letter report on a possible removal action at Pits 3 and 5 was submitted to the regulatory agencies for review.

Significant progress was made on preparation of the SWRI. Actual preparation time will exceed that which was originally estimated.

MAYWOOD SITE

Maywood/Rochelle Park/Lodi, New Jersey

Field Office: DOE Field Office, Oak Ridge

Size: 12 acres

NPL Status: Placed on the NPL on September 8, 1983.

Mission: The Maywood Site, a privately owned site previously used for thorium extraction, was acquired by DOE in 1984. The site is managed under a Congressional mandate by DOE under the Formerly Utilized Site Remedial Action Program (FUSRAP). The Maywood Site is used specifically for storage of radiologically contaminated materials resulting from remedial activities conducted on properties in the vicinity of the Maywood Site.

**Overview of
Environmental
Conditions:**

On-site and off-site soil contaminated with radiological contaminants and associated chemicals. Approximately 57 remaining vicinity properties are radiologically contaminated.

Funding in FY 92: \$2,873,000

Progress in Reaching Interagency Agreement

DOE and EPA Region II executed an IAG for the Maywood Site on April 22, 1991. Schedules were subsequently negotiated for the DOE submittal of the RI, Baseline Risk Assessment, and the FS. EPA Region II reviewed and approved the package on November 25, 1991.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG according to the FY 94 Congressional Budget, total \$3.7 million for FY 93 and \$2.8 million, for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning the public comment on the IAG has occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Significant progress was made in 1992 on the completion of RI/FS activities at the site. The Remedial Investigation Report for the Maywood Site, with the exception of additional groundwater characterization, was completed by DOE, and accepted as final by EPA Region II on December 17, 1992. The FS-EIS proposed plan is undergoing final review at EPA Region II.

The Baseline Risk Assessment for the Maywood Site was issued as a final draft on January 28, 1993. The Feasibility Study - Environmental Impact Statement for the Maywood Site was issued to EPA as a first draft on November 30, 1992. To date DOE has met all RI/FS milestones specified in the IAG. DOE continues to utilize a public information center near the site to meet with and provide information to the public on the ongoing RI/FS.

Progress in Conducting Remedial Actions at NPL Sites

No remedial action has been completed at the Maywood Site; however, substantial progress has been made using removal actions. The site consists of the DOE-owned Maywood Interim Storage Site and 82 vicinity properties, all of which are contaminated. Twenty-five of the 82 properties were cleaned up using removal actions, and the resulting waste was placed in storage in the engineered cell at the Maywood Interim Storage Site.

MONTICELLO MILL SITE AND VICINITY PROPERTIES

Monticello, Utah

Field Office:	DOE Albuquerque Grand Junction Project Office
Size:	78 acres (Mill Site), plus approximately 410 vicinity properties in the town of Monticello and 22 peripheral properties.
NPL Status:	Facility comprised of two individual NPL sites: the Mill Site was placed on the NPL on November 21, 1989 and the Vicinity Properties on June 10, 1986.
Mission:	Former uranium milling operation.
Overview of Environmental Conditions:	Soil, groundwater and surface water contamination from radioactive mill tailings, process equipment, and milling operations. Approximately 2.5 million cubic yards of contaminated material.
Funding in FY 92:	\$15,125,000

Progress in Reaching Interagency Agreement

DOE, EPA Region VIII, and the State of Utah negotiated and signed an IAG for the Monticello Mill Site and Vicinity Properties. This IAG, which covered both NPL sites, was executed on December 22, 1988.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG at the Monticello Mill Site and Vicinity Properties, according to the FY 94 Congressional Budget, total \$23.6 million for FY 93 and \$16.8 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No public comments were received on the IAG in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Mill Site: The RI/FS addressing mill tailings and contaminated soils was completed in Calendar Year 1990. An additional RI/FS addressing groundwater and surface water contamination commenced in Calendar Year 1992. An RI/FS Work Plan was approved by EPA and the State of Utah and field activities were initiated.

Vicinity Properties: The RI/FS for the Vicinity Properties was completed in Calendar Year 1989.

Progress in Conducting Remedial Actions at NPL Sites

Mill Site: The ROD for OU 1 and 2 of the Mill Site, a separate NPL site, was signed by EPA in August 1990 and by DOE in September 1990. Construction of site preparation facilities has commenced. These facilities include the installation of surface water drainage control structures, decontamination facilities, office buildings, and site haul roads. Remedial designs for the repository, haul roads to the repository, and mill site excavation plans continue to be developed.

Vicinity Properties: The ROD covering the Vicinity Properties was signed by EPA in September 1989 and by DOE in December 1989. Since the last Report to Congress, remedial actions have been completed on 89 of the current 280 Vicinity Properties qualifying for remediation. Therefore, remedial actions for 194 vicinity properties are complete. Contaminated materials have been excavated and taken to the Mill Site for interim storage prior to placement in the Mill Site repository. Excavated properties have been backfilled and revegetated.

MOUND PLANT

Dayton, Ohio

Field Office: DOE Field Office, Albuquerque

Size: 306 acres

NPL Status: Placed on the NPL on November 21, 1989.

Mission: The Mound Plant has been in continuous use since 1948. Its main mission is to manufacture non-nuclear components and tritium-containing components for nuclear weapons which are then assembled at another site. Other activities include the separation, purification, and sale of stable isotopes of the noble gases; solar energy; fossil fuels; nuclear safeguards; waste management; heat source testing (plutonium) and fusion fuel systems.

**Overview of
Environmental
Conditions:**

Tritium and volatile organic compound contamination of on-site and off-site groundwater and soils contaminated with residual plutonium from past on-site operations.

Funding in FY 92: \$17,379,000

Progress in Reaching Interagency Agreement

DOE and EPA Region V executed the IAG for the Mound Plant on August 6, 1990. The State of Ohio has expressed interest in a three-party agreement, with the State of Ohio to be added as a party to the IAG. DOE has requested that EPA support the effort to modify the IAG to include the state. The Ohio Attorney General's Office has communicated conditions under which the state would consider joining the agreement. A Tri-Party Agreement (TPA) is currently being negotiated and should be finalized by May, 1993. Meanwhile, the State of Ohio is involved in monthly project manager meetings and document review participating as party to the agreement.

Public Comments Regarding Proposed Interagency Agreements

Limited public comments were received on the IAG. Most of the public comments inquired why the site was placed on the NPL. There were no negative comments. EPA Region V and DOE evaluated all public comments and determined that no modifications to the IAG were required. An additional public comment period is scheduled upon finalization of the modification to include the State of Ohio.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The Mound Plant has nine OU that break up Mound into discrete geographic units. OU 7 (Limited Action Sites) and 8 (underground tanks) have been closed out as needing no further action (under the IAG). OU 3 (miscellaneous sites) is in the process of being closed out as needing no further action. A few individual sites in OU 3 which require more characterization will be transferred to other OUs. OU 1 (Area B/Groundwater) continued its assessment activities, including hydrogeological investigations and soil gas surveys. OU 9 continues its site-wide assessment activities including residential well surveys, ecological surveys, seismic refractive studies and hydrogeologic investigations. OU 2 (Main Hill seeps) and 5 (rad contaminated soils) has soil gas surveys completed. Data from these surveys will be used to write RI/FS work plans. OU 4 (Miami-Erie Canal) has been fully characterized for Pu-238. A determination must be made that no mixed waste is present before a decision for a removal action is made. Sampling is scheduled for early FY93, upon completion of floodplain/wetland notification requirements. OU 6 are decontaminated soil sites not included in the IAG. These sites are verified under the IAG that they are acceptably remediated.

Progress in Conducting Remedial Actions at NPL Sites

The first ROD on OU 1 (Area B/groundwater) is scheduled for completion in early FY 94. Remedial action is not scheduled to begin at Mound until FY 94. However, several of the sites with releases may require interim remedial actions prior to FY 94. No immediate health risks have been identified to date based on information available for the approximately 125 known potential sites.

OAK RIDGE RESERVATION [OAK RIDGE NATIONAL LABORATORY; Y-12 PLANT; K-25 (OAK RIDGE GASEOUS DIFFUSION PLANT); OAK RIDGE ASSOCIATED UNIVERSITIES, AND CLINCH RIVER] Oak Ridge, Tennessee

**Field/Program
Office:**

DOE Field Office, Oak Ridge

Size:

37,000 acres

NPL Status:

Placed on the NPL on November 21, 1989.

Mission:

The Oak Ridge National Laboratory (ORNL) provides extensive research and development in energy production. Activities include reactor and accelerator development and operation, production and sale of radioactive and stable isotopes, and environmental and health research.

K-25 (the Oak Ridge Gaseous Diffusion Plant) was a production and development facility for uranium enrichment. Production operations at K-25 were shut down in 1985. The present mission of K-25 is environmental restoration, decontamination and decommissioning, waste management, and providing support for other government agencies in the Work for Others program.

The Y-12 Plant's original mission was to separate the fissionable isotope of uranium (U-235) by the electromagnetic process. The plant today has four principal missions: to dismantle nuclear weapon components, provide special production support to DOE programs, support ORNL research programs, and serve as a manufacturing, technology, and demonstration center.

The Oak Ridge Associated Universities (ORAU) is a private not-for-profit association of 49 colleges and universities. It is a contractor to DOE, conducting research and education programs in the areas of energy, health, and the environment for DOE, ORAU's member institutions, and other private and government organizations.

**Overview of
Environmental
Conditions:**

The sites include waste units that are either radioactive, hazardous, mixed (both radioactive and hazardous), or non-radioactive/non-hazardous. Examples of the concerns include radioactive underground tanks, solid waste disposal areas, liquid waste pit and trenches, hydrofracture facilities, and dense, non-aqueous phase liquid migration in fractured rock. More than 400 contaminated units exist at the reservation, and surface water and groundwater are also contaminated.

Funding in FY 92: \$87,379,000

Progress in Reaching Interagency Agreement

DOE, EPA Region IV, and the State of Tennessee have negotiated an IAG for the Oak Ridge Reservation (ORR); Y-12 Plant; K-25; ORAU; and the Clinch River). The IAG was effective on January 1, 1992. In accordance with the IAG, the ORR is currently integrating the requirements of corrective measures under RCRA and applicable state law with response actions under CERCLA.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG at the Oak Ridge Reservation, according to the FY 94 Congressional Budget, total \$135.4 million for FY 93 and \$151.8 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG has occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

To address contamination of the ORR as a whole, the reservation has been partitioned into 44 OUs consisting of source control OUs and integrator OUs (e.g., surface water and ground water) that may be prioritized to achieve the most effective and rapid investigation and cleanup. OUs are redefined and work schedules are adjusted as investigations progress and new data become available. RI/FSs are being conducted for each OU. Removal Actions and Interim Remedial Actions are conducted where appropriate to address threats to human health and the environment in advance of the final remedy.

The remedial action work plans, site characterization studies, and RI reports developed have been prepared using EPA guidelines for CERCLA FI/FSs and RFIs where appropriate. These documents were sent out in accordance with milestones specified in the negotiated IAG and the schedule defined in the RCRA permit. Public meetings were held during the year to advise the public of the restoration process being implemented to remediate the ORR and to address the public's concerns over the relative risk associated with the off-site contamination. Work completed or underway during 1992 and early 1993 includes:

- Two RI work plans, one RI/FS Report, one Remedial Action Plan, and one Interim Remedial Action Plan were submitted to EPA and the state for review at K-25;
- One Work Plan, one RI/FS Report, one FS Report, one Interim Remedial Measures Study, and three Interim Remedial Action Plans were submitted to EPA and the state for review at ORNL;
- Three RI work plans, three RI Reports, one FS Report, two Interim Remedial Action Plans, and one Remedial Action Plan were submitted to EPA and the state for approval at the Y-12 Plant; and
- The RI work plan for Clinch River was submitted.

Additional work under way includes:

- RI fieldwork at the East Fork Poplar Creek; and
- RI Fieldwork at the Clinch and Tennessee Rivers.

Progress in Conducting Remedial Actions at NPL Sites

Final CERCLA remedial action will be initiated after RODs are signed. Removal and interim cleanup actions completed or underway during 1992 or early 1993 and include:

- Construction of the recommended remedial alternative (a cap over the site) for the United Nuclear Corporation Disposal Site at Y-12 Plant ;
- Mercury removal for Mercury Tank Remediation at Y-12 Plant (began December, 1992);
- An Interim Action ROD was signed for ORNL Waste Area Grouping (WAG) II (the White Wing Scrap Yard);
- An Interim Action ROD was signed for the K-25 K-1070 OU Leachate Stream;
- A ROD was signed recommending no further action at the Y-12 Plant Plating Shop Container Areas; and
- An Interim Action ROD was signed for ORNL WAG 13 (the Cesium Plots).

ROCKY FLATS PLANT

Golden, Colorado

Field Office: Rocky Flats Office

Size: 6,550 acres

NPL Status: Placed on the NPL on October 4, 1989.

Mission: Rocky Flats Plant (RFP) began operations in 1952 and is tasked with producing component parts for nuclear weapons. Key production activities involve the fabrication of parts from plutonium, uranium, and nonradioactive metals, principally beryllium, stainless steel, and aluminum. Components made at the Rocky Flats Plant are shipped elsewhere for final assembly. Components from obsolete nuclear weapons are disassembled and processed to recover plutonium and americium. Enriched uranium components are separated and shipped to Oak Ridge, Tennessee, for recycling.

**Overview of
Environmental
Conditions:**

On-site contamination of soil, groundwater, and surface water by chemical and radioactive materials used by the facility. Off-site soil contamination also has been identified.

Funding in FY 92: \$42,450,000

Progress in Reaching Interagency Agreement

DOE, EPA Region VIII, and the State of Colorado executed an IAG for the RFP on January 22, 1991. The IAG supersedes the RCRA/CERCLA Compliance Agreement executed on July 31, 1986 among DOE, EPA Region VIII and the State of Colorado. The IAG establishes cleanup schedules and delineates regulatory responsibilities of EPA Region VIII and the State of Colorado.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG, according to the FY 94 Congressional Budget, total \$113.0 million for FY 93 and \$105.2 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG occurred in 1992.

A complete summary of public comments on the draft IAG and responses to these comments is documented in the Final Responsiveness Summary dated August 16, 1990.

Progress in Conducting Remedial Investigations/Feasibility Studies

Initial site characterization efforts began in July, 1986 under the RCRA/CERCLA Compliance Agreement and continue under the IAG executed on January 22, 1991.

A comprehensive list of all known and suspected hazardous, radioactive, and mixed waste sources at the Rocky Flats Plant has been compiled, including descriptions and all known release information for 178 individual hazardous substance sites. These sites have been categorized for further environmental investigation and remediation into 16 OUs based on cleanup priorities, waste type, and geographic location.

Sitewide activities include tasks and projects that encompass a wide variety of plans, procedures, reports, studies, and other activities that apply to and support the assessment and remediation activities of the operable units. Some of these activities are required by the IAG, and others are required by RFP and/or DOE orders, policies and procedures. A listing of the more significant sitewide accomplishments is presented below.

In the past six months, several enhancements have been implemented to correct identified deficiencies in the sample management process and in the Rocky Flats Environmental Data System (RFEDS). Sample management staff has been increased, and the pool of qualified laboratories for radionuclides analysis has been increased by four. These efforts have resulted in an increase in laboratory capacity, a decrease in sample backlog, and, in the case of one laboratory, a decrease in lab turn-around time from 120-180 days to 61-75 days. Cost management of the large ER sample analysis budget (\$22.9 million in FY 93) has also been addressed. Staff is working with EG&G (the management and operating contractor) Procurement, Accounting and Central Planning to develop a customized system for handling analysis accruals and invoices to that accurate, up-to-date charges are assessed against ER projects for sample analysis.

Preliminary scheduling and organization of the administrative record (AR) started in 1990. The first AR index was compiled in December, 1990, and a total of seven indexes have been delivered to the regulatory agencies since 1990. Microfiche reader/printers were purchased and placed in the four public repositories for public use in viewing the AR microfiche in November, 1991, and the first set of microfiche were installed in the public repositories in February, 1992.

The AR Screening and Processing Procedure was completed and approved by the Associate General Manager December 4, 1992. The procedure is now ready for controlled distribution.

All milestones associated with the Community Relations Plan (CRP) have been completed on schedule. The CRP was approved by EPA and Colorado Department of Health (CDH) and issued in December, 1991. During FY 92, the following activities were accomplished:

- 13 Environmental Restoration Update newsletters have been issued to the public;

- Eight quarterly public information meetings, as required by the IAG, have been held;
- Technical Review Group (TRG) was organized in June, 1991 (the TRG has met monthly since that time to provide public input on draft work plans and other documents);
- Eight 60-day public comment periods have been held on IAG-required documents (each comment period included a public information meeting and a public comment meeting);
- Monthly coordination meetings have been held with EPA and CDH since January, 1990;
- All required documents have been placed in Rocky Flats public Reading Rooms and five other repositories; and
- As required by the CRP, numerous tours, presentations and briefings have been conducted, nearly 25 fact sheets have been produced, and numerous citizen questions have been answered.

Decontamination facilities must be provided to decontaminate equipment used in RI field work. Their primary purpose is to eliminate the transfer of contaminants from a contaminated borehole or well to a clean hole that could occur if drill bits were not decontaminated between use.

In FY 91, an obsolete decontamination facility (decon pad) was replaced by an improved decon pad and designated as the 903A Decon Pad. In FY 92, design was completed, and construction started on a decon pad inside the protected area to support RI work in that area. Construction was completed in January, 1993.

The IAG-required Sitewide Health and Safety Program Plan (HSPP) was completed in November, 1990. The HSPP establishes the minimum requirements for compliance with worker health and safety. Each field activity conducted under the IAG is governed by a Site-Specific Health and Safety Plan prepared to be in compliance with the HSPP. Approximately 350 workers have been trained under the requirements of the HSPP.

The IAG-required Quality Assurance Project Plan (QAPP) was completed and approved by the regulatory agencies in 1991. The basic implementing administrative procedures were issued in August, 1991. Approximately 25 broad scope Readiness Reviews and Surveillances and over 200 in-depth QA field inspections have been performed. Extensive QA training for field personnel has been held.

The Historical Release Report (HRR - an IAG milestone which documents all contaminant spills and releases at RFP since inception of the plant) was prepared, and the final draft delivered to the regulatory agencies on June 3, 1992.

The Sitewide Treatability Program, implemented to meet the requirements of Article XI of the IAG, is designed to identify candidate technologies for use in corrective actions/remedial actions at RFP. The primary purpose of the program is to expedite the screening of

technologies and alternatives for the types of contaminants that appear to be generally present at RFP and are present at more than one OU. The final Treatability Study Plan (TSP), an IAG milestone, was delivered to the regulatory agents on June 3, 1991. An annual treatability study report was completed in FY 91, and the FY 92 annual report in draft form has been completed. To date, three test programs have been completed, one test is in progress, and soil samples for two test programs have been collected. Seven work plans for additional treatability studies have also been completed.

Phase I and phase II RIs for OU1 (881 Hillside) completed in 1987 indicated the presence of organics in the soils and ground water of the 881 Hillside and provided the basis of the decision for an interim remedial action (IRA) at OU1. Field work for a phase III RI, which will provide the data for the final remedial action decision, was begun in August 1991 and completed in January, 1992. This RI implemented the detailed work plan approved by EPA and CDH. The RI report including the Baseline Risk Assessment was completed and submitted to the regulatory agencies on October 28, 1992, the extended IAG milestone date. The FS for OU1 is underway.

A phase I RI of OU2 (903 Pad, Mound and Trenches) was completed in 1986, and the alluvial portion of a phase II RI, which will provide data for the final remediation decision was begun in September, 1991 and completed in November 1992. A proposed schedule for the bedrock portion of the RI is currently in review at the regulatory agencies.

The Historical Information and Preliminary Health Risk Assessment Report and Past Remedy Report for OU3 (Offsite Areas) were completed and approved by DOE and the regulatory agencies in FY 91. The RI Work Plan was approved by EPA and CDH early FY 92, and RI field work began in May, 1992.

The final RFI/RI Work Plan for OU4 (Solar Ponds) was submitted to the regulatory agencies on November 26, 1991, the IAG milestone date, and conditional approval was received in May, 1992. The RFI/RI subcontract to implement the work plan was awarded, mobilization began in November, 1992, and field work began in December.

The draft and final RFI/RI Work Plans for OU5 (Woman Creek) were completed on the IAG schedule dates, and the RI field work began in August, 1992. Two Technical Memoranda further defining requirements of the work plan have been approved by the regulatory agencies and implemented. The draft and final RFI/RI Work Plans for OU6 (Walnut creek) were completed on the IAG schedule dates, and the Ri field work began in September, 1992.

The draft and final RFI/RI work plans (IAG milestones) for OUs 8 through 15 have been completed. An Optimal Interim Remedial Action Plan (OIRAP), which will combine part the field work for OUs 8, 9, 10, 12, 13 and 14, was developed to provide for the most effective and efficient use of available resources. The plan will also provide a vehicle to obtain IAG schedule relief. The plan encompasses actions to safeguard the safety of the public and environmental while invasive investigative field work within the RFP Industrial Area is deferred until safety and security considerations no longer impact the RI/FS process for the affected OUs.

OU16 (Low Priority Sites), the draft and final No Further Action Justification documents were delivered to the regulatory agencies on their IAG milestone dates. The document provides technical justification for no additional investigation or remediation at 7 RFP IHSSs.

Progress in Conducting Remedial Actions at NPL Sites

The requirements for an OU1 Interim Remedial Action (IRA) were generated from the phase II RI. All IAG milestones for the design, construction and startup of the IRA UV-Peroxide treatment facility and french drain ground water collection system were completed on schedule. Construction of the treatment building, installation of processing equipment, construction of influent and effluent storage tanks, and design of the french drain were completed in FY 91. Construction of the french drain and installation of 11 monitoring wells were completed in the second quarter of FY 92. The system began operation in May, 1992 and has collected and treated over 800,000 gallons of water to date and has released over 700,000 gallons of treated water to the South interceptor ditch. Revegetation of areas on the 881 Hillside disturbed by the construction activities is complete.

The single IRA originally planned for OU2 was divided into 2 IRAs in FY 90 as a result of public review of the plans. A surface water treatment facility for the Walnut Creek drainage was mandated, and a vapor extraction system for the removal of organics from soils was planned.

The OU2 South Walnut creek Surface Water Interim Measures (IM)/RA Decision Document was approved by EPA and CDH in May, 1991. Phase I of this project includes collection, storage and treatment of surface water for removal of organics using granular activated carbon (GAC). Phase I operation began in May, 1991. Phase II of this IRA, which added a radionuclides removal system, was completed in April, 1992. To date, the Phase I and Phase II systems have collected, treated and discharged over 11 million gallons of surface water.

The concept for a subsurface vapor extraction IRA for OU2 has been approved by EPA and CDH. The pilot test plan for the first stage of this project was delivered to the regulatory agencies on October 29, 1992, the IAG milestone date. This system will employ in situ vacuum-enhanced vapor extraction to treat soils in the vadose zone in OU2 IHSSs for volatile organics.

One result of the focus of attention on the OU4 remediation (Pondcrete) activities has been the complete reorganization and expansion of the Pondcrete Project Office. The new organization is now staffed with a sufficient number of dedicated personnel to manage all the critical aspects of the project. A listing of the more significant accomplishments of the Pondcrete Project since FY 90 are described below:

- 9,376 pondcrete blocks were shipped to Nevada Test Site for disposal;
- Repackaging of deteriorated pondcrete and saltcrete blocks were completed;
- Waste characterization was completed for pond sludge, pondcrete and saltcrete;
- Treatability studies were completed for pond sludge - this included incorporation of dewatering of 207A and B series pond for waste minimization which reduced processed waste volumes significantly;
- Waste analysis plan for 207C and clarifier was completed and submitted to the Nevada Test Site for review - A Process Control Plan was developed that

incorporated process controls as the primary demonstration of waste acceptability to the waste acceptance criteria and statistically based sampling to validate the effectiveness of the process controls;

- A RFP Waste Certification Plan was formulated and is in final review;
- The design, procurement and assembly of the process train for the first waste stream, 207C and Clarifier is 85% was completed;
- A request was completed for change to interim status to incorporate the processing of pond sludge into the RFP RCRA operating permit;
- Construction was completed of three 18,000 gallon per day evaporators in Building 910 (testing is in progress);
- Construction of three 500,000 gallon modular tanks was completed to function as surge tanks in collecting Interceptor Trench Water at a rate of 4 million gallon per year;
- IM/IRA for the construction and operation of the Building 910 evaporator approved;
- Process Control Plans and supporting operating procedures for the Building 910 evaporators completed and submitted for review;
- SARS for the pond sludge processing, Building 910 and mixed waste storage on the 750 and 904 pads have been completed and submitted for DOE review; and
- 207A pond has been emptied.

Potential Assessment of a Stipulated Penalty Against DOE

In October, 1992, the DOE notified EPA Region VIII and the CDH that the approved OU 2 bedrock RFI/RI Work Plan activities had not been conducted by DOE in FY 92 due to technical considerations and other IAG priorities. As a result, DOE stated that the RFI/RI Report milestone of March 12, 1993 would be missed. Under the provisions of the IAG, this decision by DOE not to implement the approved workplan required formal approval from EPA and CDH, which DOE did not obtain.

In January, 1993, EPA and CDH gave early warning to DOE that they intended to assess stipulated penalties if DOE missed the milestone due date. In February, 1993, DOE submitted a request to EPA and CDH for a nine-month extension for the submittal of the draft and final RFI/RI Reports. In March, 1993, EPA and CDH denied DOE's request for extension stating the primary reason for missing the milestone was non-implementation of the approved workplan by DOE, which did not constitute a valid justification for the extension under the terms of the IAG.

In a March 1993 DOE response to EPA and CDH regarding the denied extension request, DOE acknowledged that the primary reason for missing the milestone was due to DOE's decision

in early 1992 not to implement the approved workplan. This response suggested that a meeting be held to attempt to reach agreement on the approach to satisfy the OU 2 milestone, including if necessary, the payment of an appropriate penalty by DOE. A response from EPA and CDH is pending.

DOE, EPA, and CDH recognize that deeper problems exist in DOE's work management structure and in the degree and timing of information sharing among the parties. The three parties agree to further explore ways to accelerate the work and address these fundamental problems.

ROSS COMPLEX

Vancouver, Washington

Field Office: Bonneville Power Administration (BPA)

Size: 250 acres

NPL Status: Placed on the NPL on November 21, 1989.

Mission: The Ross Complex, in operation since the late 1930s, acts as BPA's central control center for the transmission of electricity throughout the Pacific Northwest. The complex also acts as a research and testing, maintenance, construction, operations and waste handling facility for BPA.

**Overview of
Environmental
Conditions:**

Soil contamination due to historical disposal of polychlorinated biphenyl (PCB)-laden capacitors; potential solvent contamination of groundwater.

Funding in FY 92: \$1,808,900

Progress in Reaching Interagency Agreement

DOE, EPA Region X, and State of Washington executed an IAG for the Ross Complex site on May 1, 1990. The agreement serves as a framework for conducting remedial activities in accordance with CERCLA Section 120 and the NCP.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the IAG occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The RI/FS Scope of Work was completed and submitted to EPA Region X, and the State of Washington on March 15, 1990. The RI/FS Work Plan was submitted to all parties on June 7, 1991. It was reviewed and approved by EPA and the State of Washington. Phase I of the RI field work was completed in September 1991. Field work for Phase II of the RI was completed in August, 1992.

In an agreement with the EPA and the State, the site was divided into two OUs. OU A addresses surface soil contamination and OU B addresses contamination at depth, principally groundwater.

The progress toward completion of OU A evolved as follows:

- The Draft RI was issued on January 6, 1992;
- The Draft FS was issued on April 16, 1992;
- The Draft proposed plan was issued on August 20, 1992;
- The Public meeting on proposed plan was held on September 2, 1992; and
- The Draft ROD was issued for comment on September 4, 1992.

The progress toward completion of OU B includes the issuance of the Draft RI report on December 10, 1992.

Progress in Conducting Remedial Actions at NPL Sites

The RI report for OU A suggested that contaminant concentrations found in the soils at the Ross Substation, Capacitor Test Lab and Wood Pole Storage Area, East, may pose an unacceptable risk of exposure to carcinogens. Remediation is planned for these three areas.

In addition, the results of the RI for OU A indicated that certain contaminant concentrations, in seven individual waste units, exceeded soil cleanup levels promulgated under the Washington State Model Toxics Control Act (MTCA). BPA undertook independent actions at these seven locations consisting of excavation and disposal of surface soils.

Based on the Draft RI Report for OU B, it has been demonstrated that the residual occurrence of limited volatile organics in the groundwater does not constitute an on-site or off-site risk to human health. Continued groundwater monitoring is anticipated.

SAVANNAH RIVER SITE

Aiken, South Carolina

Field Office:	DOE Field Office, Savannah River
Size:	Approximately 300 square miles
NPL Status:	Placed on the NPL on November 21, 1989.
Mission:	The Savannah River Site (SRS), established in 1950 by the Atomic Energy Commission, was constructed to produce the basic materials used in the fabrication of nuclear weapons, primarily tritium and plutonium-239. SRS also serves as a lumber and forestry research center for the U.S. Forest Service and houses the Savannah River Ecology Laboratory, a research center operated for DOE by the University of Georgia.
Overview of Environmental Conditions:	On-site soil, groundwater and air emissions associated with chemical and radioactive releases.
Funding in FY 92:	\$27,413,000

Progress in Reaching Interagency Agreement

DOE, EPA Region IV, and the State of South Carolina negotiated an IAG for SRS during Calendar Years 1990 through 1992. The IAG was executed on January 15, 1993.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the IAG according to the FY 94 Congressional Budget, total \$32.6 million for FY 93 and \$33.5 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

The IAG Notice of Intent was signed on December 2, 1991. The document was released for 60-day public review on December 17, 1991. A public meeting was held on January 23, 1992 with DOE, EPA Region IV, and the State of South Carolina present. Significant public comments focused on; the specific roles and jurisdictions of the South Carolina Department of Health and Environmental Control (SCDHEC) and EPA Region IV in maintaining and enforcing DOE SRS clean-up actions.

The public comments also included concerns that the IAG should not limit SCDHEC Resource Conservation and Recovery Act (RCRA) authority. The IAG was revised to better clarify dispute resolution procedures and authorities of the two regulators for oversight of RCRA and CERCLA cleanup activities.

Additionally, public comments showed the need to revise SRS' system of prioritizing waste units. The IAG was revised to include a priority system recommended by EPA.

Comments requesting a Site Advisory Board consisting of members of the public were addressed in a revised Public Involvement Plan. SRS is also working to develop a site-specific advisory board.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

A RCRA 3004(u) permit was issued by EPA Region IV and the State of South Carolina on September 29, 1987. A RFI Program Plan, which outlines the requirements for the preparation of unit-specific investigation plans and contains a schedule for the submittal of the plans, was approved by EPA Region IV on September 6, 1989. In anticipation of the Savannah River Site being placed on the NPL, the RFI Program Plan was revised to include CERCLA requirements so that the results obtained from the execution of the unit-specific plans would meet the requirements of a RCRA RFI and a CERCLA Remedial Investigation (RFI/RI). The following activities were accomplished during Calendar Year 1992:

- Three Interim Action RODs for the Metallurgical Laboratory Hazardous Waste Management Facility Operable Unit, A/M Groundwater OU, and the M-Area Hazardous Waste Management Facility OU were approved;
- Proposed plans for Gunsite 113 Rubble Pit, Gunsite 720 Rubble Pit, and Grace Road Site were submitted to the regulators;
- 22 Site Evaluation Reports were submitted;
- 33 RFI/RI plans were submitted to the regulators;
- A grant to provide funding to the State of South Carolina for oversight activities was renewed;
- The baseline risk assessment was submitted; and
- Proposed closure plans for two hazardous waste management facilities were submitted to regulators for approval.

Progress in Conducting Remedial Actions at NPL Sites

The following activities were accomplished in Calendar Year 1992:

- One RCRA hazardous waste management facility has been closed and certified according to the approved closure plan; and
- Groundwater corrective action is ongoing at one hazardous waste management facility.

ST. LOUIS SITE (St. Louis Airport Site, Latty Avenue Properties and Vicinity Properties) Hazelwood, Missouri

Field Office: DOE Field Office, Oak Ridge

Size: 21.7 acres

NPL Status: Placed on the NPL on October 4, 1989.

Mission: The St. Louis Site, established as a storage site in 1946, stores residues, contaminated scrap and equipment generated by processing plants in St. Louis from 1946 to 1969. Cleanup authority at the site was acquired by DOE under a Congressional mandate and is managed by DOE under its FUSRAP. FUSRAP sites comprise sites formerly associated with the Manhattan Engineer District Project and the Atomic Energy Commission.

**Overview of
Environmental
Conditions:**

On-site soil and groundwater contamination by radioactive constituents. Off-site soil and sediment contamination also identified.

Funding in FY 92: \$8,870,000

Progress in Reaching Interagency Agreement

DOE and EPA Region VII executed an FFA for the St. Louis Site on June 26, 1990. The St. Louis Site consists of the St. Louis Airport Site, Latty Avenue Properties and Vicinity Properties, all of which were added to EPA's NPL in October 1989. An additional site, not included in the original 1989 NPL, is being addressed in accordance with requirements stipulated in the FFA to make the remediation process more efficient. This site, identified as the St. Louis Downtown Site, is now part of DOE's FUSRAP program.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment to the FFA occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

The RI/FS-EIS work plan for the St. Louis Site was approved by EPA Region VII in Calendar Year 1991. A public scoping meeting for the preparation of an RI/FS-EIS was held in January 1992. An RI report was approved by EPA Region VII in 1992. Some limited additional field

investigation was performed in FY 92 to supplement the existing characterization data. An initial Screening of Alternatives was approved by EPA Region VII in FY 92. Based on the results of the Initial Screening of Alternatives, an FS is being prepared and issued for review by EPA Region VII and the State of Missouri in FY 93.

Progress in Conducting Remedial Actions at NPL Sites

Final remedial action will be implemented following signing of a ROD. Proposals for interim cleanup measures have been made for properties in the vicinity of the St. Louis Airport Site, however, these proposals have been put on hold due to local opposition to temporary storage of generated soils on-site. Modest interim cleanup measures have been completed at the St. Louis Downtown Site to accommodate site infrastructure work conducted by the site owner, Maltincksoett Incorporated.

WAYNE SITE

Wayne and Pequannock Townships, New Jersey

Field Office: DOE Field Office, Oak Ridge

Size: 7 acres

NPL Status: Placed on the NPL on September 21, 1984.

Mission: The Wayne Site, a privately owned site previously used for thorium extraction, was acquired by DOE in 1984 under a Congressional mandate and is managed by DOE under its FUSRAP. The Wayne Site is used specifically as an interim storage site for contaminated material removed during cleanup of the site and several vicinity properties.

**Overview of
Environmental
Conditions:**

On-site and off-site soil contaminated by radiological and chemical constituents.

Funding in FY 92: \$4,534,000

Progress in Reaching Interagency Agreement

DOE and EPA Region II executed an FFA for the Wayne Site on April 22, 1991. Schedules were subsequently negotiated for the submittal of the RI, Baseline Risk Assessment, and FS reports. EPA Region II reviewed and approved the package on November 25, 1991.

Specific Cost Estimates and Budgetary Proposals Involved in Each Interagency Agreement

Funds budgeted for ER under the FFA, according to the FY 94 Congressional Budget, total 3.0 million for FY 93 and \$3.7 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

No activity concerning public comment on the FFA occurred in 1992.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Significant progress was made during 1992 on the completion of RI/FS activities at the site. Analytical results in support of the site RI were obtained in early 1992. To date, DOE has met

all RI/FS milestones specified in the FFA. DOE opened a public information center at the site in March 1993 to provide information on site RI/FS progress.

Progress in Conducting Remedial Actions at NPL Sites

Final remedial action will be initiated after signing a ROD. Earlier removal actions at the site entailed removing all waste from 17 vicinity properties and storing it in an engineered waste storage pile at the Wayne Interim Storage Site.

WELDON SPRING SITE REMEDIAL ACTION PROJECT

St. Charles County, Missouri

Field Office:	DOE Field Office, Oak Ridge
Size:	226 acres
NPL Status:	Quarry placed on the NPL on July 22, 1987 and Chemical Plant and Raffinate Pits placed on the NPL on March 13, 1989.
Mission:	The Weldon Spring Site was developed by the U.S. Army for explosives production during World War II, and was operated by the Atomic Energy Commission from 1955 to 1966 as a uranium processing plant.
Overview of Environmental Conditions:	Soil, surface water, groundwater, and building rubble contamination resulting from the handling and disposal of uranium ore concentrates and scrap.
Funding in FY 92:	\$43,068,000

Progress in Reaching Interagency Agreement (IAG)

DOE and EPA Region VII have entered into an IAG signed June 30, 1992. Subsequently, an Amended FFA has been negotiated which makes Missouri a signatory. This FFA modification will be completed by the third quarter of FY 93.

Specific Cost Estimates and Budgetary Proposals Involved in Each IAG Interagency Agreement

Funds budgeted for ER under the IAG at the site according to the FY 94 Congressional Budget, total \$48.5 million for FY 93 and \$52.5 million for FY 94.

Public Comments Regarding Proposed Interagency Agreements

The public comment period for the IAG began on March 22, 1992 and remained open for 45 days. No comments were received during this comment period.

EPA Region VII will publish notices of availability of the Amended IAG and will provide a public comment period - date not yet determined.

Progress in Conducting Remedial Investigations/Feasibility Studies at NPL Sites

Initial work was started under a CERCLA/NEPA Federal Facility Compliance Agreement executed in 1986. Subsequently, the site was placed on the NPL in July, 1987. The Weldon Spring Site project issued a work plan in August, 1988 which presented the overall strategy for accomplishing remedial actions. That strategy included the development of an umbrella RI/FS for the chemical plant area, an RI/FS for quarry bulk wastes, an RI/FS for quarry residuals, and several interim response actions. A need has subsequently been identified to specifically address groundwater at the chemical plant site through an additional RI/FS.

Major accomplishments include: 1) the completion of an RI/FS for the bulk waste removal action at the quarry, 2) completion of documents comprising the Draft RI/FS-Environmental Impact Statement (EIS) for the chemical plant area (the public comment period on the latter documents closed on February 19, 1993); 3) development of a draft quarry residuals work plan for the RI/FS (the draft work plan is scheduled for release for agency review in March 1993); and 4) scoping for the groundwater operable unit started.

Progress in Conducting Remedial Actions at NPL Sites

The ROD for the Quarry Bulk Wastes at the Weldon Spring Site was signed September 1990. The ROD addressed the removal of contaminated bulk wastes from the Weldon Spring Quarry and transportation of the wastes over a specially constructed and dedicated haul road to the Weldon Spring Chemical Plant Area. The wastes will be stored in an engineered temporary storage area pending a decision on final site remediation. The ROD was prepared in conformity with the final RI/FS-Environmental Assessment (EA) of February 1990. A Finding of No Significant Impact was identified and signed on October 1990.

The draft ROD for the Chemical Plant Area has been distributed for review on February 12, 1993 with submittal of the final document for EPA signature scheduled for September 1993. The preferred remedy is to dispose of all wastes in an engineered facility on site.

The major accomplishments for the Weldon Spring Site for FY 92 are: quarry water treatment plant building and interior construction complete with clean water testing underway; engineering complete and construction begun for quarry bulk waste site preparation; quarry haul road construction complete; construction of a new St. Charles County water tower complete; and subcontracts awarded for building dismantlement at the chemical plant.

I. Individual Narratives for Facilities Not on the NPL

This section of the Annual Report provides descriptions of select DOE facilities not on the NPL. The information provided includes background summary information, environmental conditions, and the CERCLA section 120(e)(5) information requirements. Figure II-2 shows the location of the 15 non-NPL sites highlighted in this section. These facilities are also highlighted in Table III-1 of Section III. That table is a comprehensive state-by-state listing of all NPL and non-NPL listed DOE facilities identified in Update #7 of the Docket.

FIGURE II-2
U.S. DEPARTMENT OF ENERGY FACILITIES NOT ON THE NPL AND
SUBJECT TO SIGNIFICANT ENVIRONMENTAL ACTIVITIES

COVINGTON SUBSTATION

Kent, Washington

Field Office:	Bonneville Power Administration (BPA)
Size:	93 acres
NPL Status:	Not an NPL site.
Mission:	Electrical substation.
Overview of Environmental Conditions:	On-site soil contamination resulting from the historical disposal of electrical capacitors laden with polychlorinated biphenyls (PCBs), possibly including 1,2,4-trichlorobenzene.
Funding in FY 92:	\$800

The Covington Substation is not listed on the NPL. The facility is currently undergoing the assessment and evaluation stage required by Section 120(d) of CERCLA.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

A preliminary assessment (PA) was completed and submitted to EPA Region X on May 16, 1990. The PA recommended that the Covington Substation not be considered for any further remedial action under CERCLA and proposed that a cleanup of the PCB disposal areas be conducted. Following consultation with EPA Region X and the State of Washington, interim cleanup activities were initiated during August 1991 and completed in September, 1991. The final cleanup report was completed and sent to EPA Region X and the Washington Department of Ecology on February 21, 1992.

On December 7, 1992 EPA requested BPA to perform a site investigation (SI) at Covington Substation. The SI is due by July 31, 1993.

HINTON HAZARDOUS WASTE STORAGE FACILITY

Hinton, Iowa

Field Office:	Western Area Power Administration (WAPA)
Size:	0.5 acre
NPL Status:	Not an NPL site.
Mission:	Storage facility supporting electric power distribution.
Overview of Environmental Conditions:	On-site soil contamination from spillage of pentachlorophenol, a wood preserving product.
Funding in FY 92:	\$10,872

The Hinton Hazardous Waste Storage Facility is not listed on the NPL. Remediation of environmental conditions is addressed under a 1987 RCRA agreement with EPA Region VII.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

Western Area Power Administration (WAPA) prepared a sampling and analysis report in May, 1990 which was forwarded to EPA. Based on the results of the sampling effort, WAPA removed soils contaminated with pentachlorophenol, a wood preserving product used to treat wooden utility poles. This soil is currently being stored on-site under a RCRA Interim Permit for storage until an EPA-approved disposal/destruction method is identified. A Cleanup Report was sent to EPA Region VII in September, 1991. A RCRA Part B permit application, submitted to EPA Region VII in September, 1988, is still pending. Remediation efforts are being coordinated by WAPA through EPA Region VII and the Electric Power Research Institute and are projected to continue into FY 93.

HOE CREEK

Gillette, Wyoming

Field Office: Morgantown Energy Technology Center

Size: 80 acres

NPL Status: Not an NPL site.

Mission: This facility, which is not owned by DOE, is used to investigate process and environmental parameters of underground coal gasification technology.

**Overview of
Environmental
Conditions:**

Elevated levels of benzene and phenols in on-site coal seam aquifer situated about 180 feet beneath the surface.

Funding in FY 92: \$1,300,000

The Hoe Creek Site is not listed on the NPL, but it is listed on the Docket. The requisite PA/SI was initiated in February 1993.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

An interim pump and treat action was completed during the summer and fall of FY 92. A PA/SI for the site began in February, 1993, and it is expected to be completed by May, 1993. A proposed Agreement between the State of Wyoming and DOE has been drafted, the requisite reviews have been completed, and the Agreement is expected to be signed by mid FY 93. Planning for an FY 93 interim pump and treat action, which is scheduled to begin in May, 1993, is in progress. The U.S. Army Corps of Engineers has submitted a task proposal for performing a remedial action, which includes a feasibility study to select the preferred method, to cleanup the site. An award is anticipated in the spring 1993.

KANSAS CITY PLANT

Kansas City, Missouri

Field Office: DOE Field Office, Albuquerque

Size: 136 acres

NPL Status: Not an NPL site.

Mission: The Kansas City Plant produces and procures electrical, electronic, electromechanical, mechanical, plastic, and nonfissionable metal components for nuclear weapons. Operations began in 1949; however, prior to its current use, the facility was used as an airplane engine production plant for the Department of Defense.

**Overview of
Environmental
Conditions:**

On-site groundwater, soil, and air release contamination resulting from the historical use of solvents and spillage of transformer oils contaminated with PCBs.

Funding in FY 92: \$14,867,000

Kansas City Plant is not listed on the NPL. Remediation of environmental conditions is being addressed under authority of a RCRA Section 3008(h) Administrative Order on Consent.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

During FY 92, the Kansas City Plant completed RFI Fieldwork at six (6) locations known as Department 26, Miscellaneous Contaminated Soils, Outfall 001 Raceway, Plating Building, Trichloroethylene (TCE) Still Area, and Northeast Area.

Remedial activities included continued IM groundwater treatment at the Underground Tank Farm, the Northeast Area, and TCE Still Area. All discharges met the city discharge permit requirements. In addition, about 90% of the construction was completed for the D27 Outside IM action, EPA approval was received for the Corrective Measures Implementation Plan, Design, and Construction Quality Assurance Plan for the Abandoned Indian Creek Outfall, and agreement was reached with EPA that a Corrective Measures Study for the South Lagoon was not required.

Kansas City Plant also amended the railroad access agreement to cover the proposed additional fieldwork and proposed IMs.

Kansas City Plant continued with an aggressive community relations program by publishing six issues of "Focus on the Environment", presentations by 10 members of the Speakers Bureau, several tours, public meetings, two community surveys, and production of a video tape entitled "Working Clean". In addition, public library access to all EPA Deliverables was maintained.

LAWRENCE BERKELEY LABORATORY

Berkeley, California

Field Office:	DOE Field Office, San Francisco
Size:	130 acres
NPL Status:	Not an NPL site.
Mission:	The Lawrence Berkeley Laboratory (LBL), relocated to its present location in 1940 from elsewhere on the University of California at Berkeley campus, is primarily engaged in basic energy research such as high-energy physics, nuclear physics, heavy-ion fusion, magnetic fusion energy, biology, and medicine.
Overview of Environmental Conditions:	On-site releases of heavy metals and other pollutants to the sanitary sewer system and soil and groundwater contamination by chlorinated hydrocarbons, solvents, tritium, and motor fuels.
Funding in FY 92:	\$1,537,000

LBL is not listed on the NPL. Remediation of environmental conditions is being addressed under authority of a RCRA permit which includes corrective action requirements.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

LBL was recently obtained a RCRA Part B Permit. As part of this process, a RCRA Facility Assessment (RFA) was conducted by the State of California and LBL. Because of the Part B Permit and the RFA requirement, the State of California requested LBL to submit an RFI work plan in accordance with the RCRA corrective action process. The RCRA investigation process follows a phased approach starting with the RFA, followed by a RFI and Corrective Measures Study. LBL completed its RFA in July, 1992. RFI activity commenced in FY 92 and the RFI work plan was submitted to the State of California in November, 1992. RFI progress reports will be sent to regulators in November, 1994 and November, 1995 with a final RFI report scheduled for delivery to regulators in February, 1997.

LOS ALAMOS NATIONAL LABORATORY

Los Alamos, New Mexico

Field Office: DOE Field Office, Albuquerque

Size: 43 square miles

NPL Status: Not an NPL site.

Mission: The Los Alamos National Laboratory (LANL) was originally established in 1943 by the U.S. Army's Manhattan Engineer District for the purpose of developing the first atomic bombs. The primary mission is nuclear weapons research and development. In addition, many programs are conducted at LANL in the nuclear, environmental, and energy sciences; fusion, laser isotope separation, and basic research in the area of physics; chemistry; radiology; and medicine.

**Overview of
Environmental
Conditions:**

On-site soil contamination with various chemical and radiological contaminants resulting from historic waste management and disposal practices. Decontamination and decommissioning of surplus contaminated structures.

Funding in FY 92: \$42,063,000

LANL is not listed on the NPL. Remediation of environmental conditions is being addressed under authority of a RCRA permit which includes corrective action requirements.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

LANL submitted its PA/SI to EPA on October 15, 1987. When the site was scored using the Hazard Ranking System, LANL did not qualify for inclusion on the NPL.

During Calendar Year 1992, RFI work was in progress. In addition, some fieldwork associated with RCRA closure requirements has been completed, and several interim remedial measures have been planned to facilitate ongoing construction projects. Decontamination and decommissioning of a surface reactor was completed.

MIDWAY SUBSTATION

Midway, Washington

Field Office:	Bonneville Power Administration (BPA)
Size:	64 acres
NPL Status:	Not an NPL site.
Mission:	Electrical substation.
Overview of Environmental Conditions:	On-site soil contamination resulting from historical disposal of electrical capacitors laden with PCBs, and possibly various solvents and herbicides.
Funding in FY 92:	\$2,531,900

The Midway Substation is not listed on the NPL. The facility has completed a site investigation under the Washington State Model Toxics Control Act (MTCA). A majority of scheduled remediation was completed in Calendar Year 1992.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

A Preliminary Assessment (PA) was completed and submitted to EPA Region X on March 27, 1990. In a May 15, 1990 letter, EPA Region X stated that, based on a HRS evaluation, a recommendation for no further action would be entered in the Docket tracking system for the facility.

Discussions with the State of Washington led to the initiation of a site investigation in accordance with the MTCA. This investigative report was submitted to the Washington State Department of Ecology in November, 1991. Soil cleanup commenced in March, 1992 and was completed in May, 1992. The soil cleanup report was submitted to the EPA and Department of Ecology in August, 1992. Monitoring well installation was completed in September, 1992.

NEVADA TEST SITE

Nye County, Nevada

Field Office:	DOE Field Office, Nevada
Size:	864,000 acres (1,350 square miles)
NPL Status:	Not an NPL site.
Mission:	The Nevada Test Site, created in the early 1950s, is used as a detonation and testing range for nuclear weapons.
Overview of Environmental Conditions:	Contamination of on-site groundwater and soil resulting from nuclear weapons testing activities.
Funding in FY 92:	\$23,747,000

The Nevada Test Site is not listed on the NPL. The environmental restoration activities at the site have been conducted under DOE authorities.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

DOE submitted a PA and draft HRS scores for the Nevada Test Site and ten off-site locations to EPA on April 15, 1988. These sites have not been evaluated by EPA for inclusion on the NPL. DOE has rescored the Nevada Test Site, using the revised HRS. The HRS package was resubmitted to EPA Region IX in December, 1991. The Nevada Test Site is being evaluated for potential listing on the NPL by EPA.

Remediation activity undertaken during the year centered on continued research into the development of a process to remediate large areas of soils contaminated with plutonium from past activities.

There were several RCRA closure activities initiated during the year. The area 23 Hazardous Waste Trenches Closure Plan was approved by the State of Nevada. Also, the closure plans of U3fi Injection Well and Area 6 Steam Cleaning Effluent Ponds were submitted to the State of Nevada.

Nevada Test Site continues remediation of inactive underground storage tanks.

Work performed during Calendar Year 1992 for the Groundwater Characterization Project (GCP) included the drilling of two new characterization wells on Yucca Flat (ER-6-1 and ER-6-2) and one new well on Pahute Mesa (ER-20-1).. Also, nine existing wells were reconfigured to provide groundwater data suitable for use in the GCP at a relatively low cost as compared

to drilling a new well. These include five wells on Yucca Flat (UE-1q, UE-4t, UE-6e, WW-2, and WW-3), one on Frenchman Flat (WW-5A), and three on Pahute Mesa (PM-3, UE-19c WW, and UE-19H). Aquifer testing was performed on wells ER-6-1, ER-12-1, UE-1q, UE-4t, and UE-6e. Documents prepared include the GCP Strategy Plan, the GCP Health and Safety Plan, the GCP Waste Management Plan, and various GCP Standard Operating Procedures and technical position papers.

PADUCAH GASEOUS DIFFUSION PLANT

Paducah, Kentucky

Field Office:	DOE Field Office, Oak Ridge
Size:	3,423 acres
NPL Status:	Currently not an NPL site; however, EPA proposed listing the site on the NPL on May 10, 1993.
Mission:	The Paducah Gaseous Diffusion Plant, established in 1950 on the grounds of the old Kentucky Ordnance Works TNT Plant, is actively engaged in the enrichment of uranium using gaseous diffusion technology. Most of the uranium output from the plant is designated for the commercial sector.
Overview of Environmental Conditions:	The site consists of 100 SWMUs and areas of concern which have been divided into 24 WAGs. On-site chemical contamination of soils identified. Off-site groundwater contamination consists of trichloroethylene and technetium-99.
Funding in FY 92:	\$7,646,000

Paducah Gaseous Diffusion Plant is not listed on the NPL; however, EPA proposed listing the Plant on the NPL in the May 10, 1993 Federal Register (58 FR 27597). Remediation of environmental conditions is being addressed under authority of a CERCLA Sections 104 and 106 Administrative Consent Order signed November 4, 1988, and a RCRA permit jointly issued by EPA and the State of Kentucky on July 16, 1991.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

The CERCLA Section 104 and 106 Administrative Consent Order for Paducah Gaseous Diffusion Plant was executed by DOE and EPA on November 4, 1988; the RCRA Part B Permit with EPA and the State of Kentucky became effective on July 16, 1991. During 1992, activities included completion of the report on site investigations (which also satisfies the RI Work Plan requirement for 2 of the Waste Area Groups (WAGs)); completion of the underground storage tanks RI/FS; and submission of 3 Interim Corrective Measures Work Plans for 4 WAGs to the State of Kentucky and EPA. In addition, 12 Solid Waste Management Units (SWMUs) are currently undergoing PA/SI evaluation, 133 SWMUs are currently in the RI phase, and 11 sites have been found to require No Further Action. On March 18, 1993, the Proposed Plan for Interim Remedial Action of the Northwest Plume was released to the public. The public comment period was held through April 16, 1993.

PANTEX PLANT

Amarillo, Texas

Field Office:	DOE Field Office, Albuquerque
Size:	16,000 acres
NPL Status:	Currently not an NPL site, however, EPA proposed listing the site on the NPL on July 29, 1991.
Mission:	The facility was first used in 1942 by the Army Ordnance Corps for loading conventional ammunition shells and bombs and was rehabilitated in 1950 for use in nuclear weapons operations. The Pantex Plant's current functions include the fabrication of chemical high explosives; high-explosives development work in support of the design laboratories; and nuclear weapons assembly, disassembly, testing, quality assurance, repair, retirement, and disposal.
Overview of Environmental Conditions:	Potential for soil and groundwater contamination from formulation and development of high explosives; machining and plating operations; weapon component tests (non nuclear); facility and vehicle operations and maintenance activities; and, historical waste management and disposal practices. High explosive and solvent contamination may also have resulted from operations during World War II.

The Pantex Plant is not currently listed on the NPL, however, EPA proposed listing Pantex on the NPL in the July 29, 1991 FR (56 FR 35840). Remediation of environmental conditions were initially addressed under authority of a RCRA Section 3008(h) Administrative Order on Consent signed December 10, 1990 and are continuing under a RCRA permit, issued April 25, 1991 by the Texas Water Commission which includes corrective action requirements.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

During FY 92, Pantex Plant received Texas Water Commission and EPA approval on seven (7) RCRA Facility Investigation (RFI) Workplans including the Fire Training Area Burn Pits, Former Cooling Tower, Old Sewage Treatment Plant, Leaking USTs, USTs at other locations, Zone 12 Groundwater, and Burning Grounds. Six (6) additional RFI Work Plans were under preparation including the High Priority Release Sites, Miscellaneous Chemical Spills, Landfills, Firing sites, Miscellaneous High Explosive/Radioactive Material Sites, and the Verification Sites. In addition, field work was initiated at six (6) of the sites with approved workplans.

Pantex Plant has started an aggressive community relations program with the formation of a Public Coordination Group. This group will conduct or participate in meetings regarding major milestones and planning documents for the Environmental Restoration Program. Supporting efforts include issuance of press releases for major milestones, dissemination of fact sheets and brochures, maintenance of public reading rooms, and hosting public meetings.

PINELLAS PLANT

Largo, Florida

Field Office: DOE Field Office, Albuquerque

Size: 97 acres

NPL Status: Not an NPL site.

Mission: The primary mission of the Pinellas Plant is the design, development, and manufacture of special electronic and mechanical nuclear weapons components, such as neutron-generating devices, neutron detectors, and associated product testers. Other work involves electronic, ceramic, and high-vacuum technology. The Pinellas Plant has been in continuous use since 1957.

**Overview of
Environmental
Conditions:**

On-site groundwater contamination from the storage and disposal of drummed wastes and construction debris containing solvents and VOCs. Contamination on a 4.5-acre site adjacent to (formerly part of) the Pinellas facility, is of concern because of off-site groundwater contamination.

Funding in FY 92: \$2,852,000

The Pinellas Plant is not listed on the NPL. Remediation of environmental conditions is being addressed under authority of a State RCRA permit which includes corrective action requirements.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

DOE submitted PA/SI information on the Pinellas Plant to EPA Region IV on October 15, 1987. Remedial activities at the Pinellas Plant are being conducted under a RCRA permit issued February 9, 1990.

RFI fieldwork for the Miscellaneous Sites was completed in June, 1991, and the RFI Report was approved by EPA in FY 92. Of the 15 original SWMUs in the Miscellaneous Sites identified during the RFA, four (the Former Pistol Range, the Old Drum Storage Site, the Industrial Drain Leaks, and the Northeast Site) have been recommended for corrective action, while five (the West Pond, the Diesel Fuel Spill, the Southwest Ditch, the Current Fire Department Training Tank, and the Building 500 Spill Site) were recommended for further

study. The RFI Reports of these five SWMUs have been completed and were approved by EPA in FY 92. The Site Assessment Report for the 4.5-Acre Site has been completed.

Pumping of contaminated groundwater from four recovery wells at the Northeast Site to the 4.5-Acre Site treatment system began early 1992.

The 4.5-Acre Site Interim Remedial Action began in December, 1988 with the development of a groundwater recovery system to draw the VOC plume back onto the site. An iron removal system was added to pretreat the groundwater and improve the efficiency of the VOC removal. This action has successfully stabilized the VOC plume and is in the process of repositioning it back onto the 4.5-Acre Site. The State of Florida has the lead for this action and is using CERCLA cleanup requirements.

Interim Corrective Measures (ICM) began on Northeast Site and an ICM Plan is being prepared for the Pistol Range. EPA has formally agreed that remediation of the Floridian Aquifer at the Pinellas Plant is not necessary.

PORTSMOUTH GASEOUS DIFFUSION PLANT

Piketon, Ohio

Field Office: DOE Field Office, Oak Ridge

Size: 3,800 acres

NPL Status: Not an NPL site.

Mission: The Portsmouth Gaseous Diffusion Plant has been in operation since 1954, enriching uranium-235 for national defense and commercial reactors.

**Overview of
Environmental
Conditions:**

On-site soil and groundwater contamination in several areas within the site from releases of chlorinated organics, radionuclides, heavy metals, and PCBs. The site has been divided into four quadrants containing a total of 87 Solid Waste Management Units.

Funding in FY 92: \$26,714,000

Portsmouth Gaseous Diffusion Plant is not listed on the NPL. Remediation of environmental conditions is being addressed by an Administrative Order by Consent with EPA Region V under authority of Sections 3008(h) of RCRA and 106(a) of CERCLA, and a Consent Decree with the State of Ohio under Section 3008(h) of RCRA..

Progress in Conducting Remedial Actions at Facilities Not on the NPL

On August 29, 1989, the State of Ohio and DOE finalized a Consent Decree under RCRA Section 3008(h) filed with the U.S. District Court for the Southern District of Ohio, Eastern Division. On September 27, 1989, DOE executed an Administrative Order by Consent under authority of CERCLA Section 106(a) and RCRA Section 3008(h) with EPA Region V. The Consent Decree and Consent Order were negotiated to be consistent so that all work will satisfy both RCRA and CERCLA requirements. The Consent Decree and Consent Order set up a Quadrant approach for Facility Investigation and require groundwater quality assessment and closure for four RCRA units.

During FY 92, the Quadrant I, II and III RFIs were completed and a successful technology demonstration of in-situ treatment of volatile organics was conducted.

In early 1993, negotiations to amend the Consent Decree to incorporate land disposal restricted wastes continued with the State. Additionally, efforts continued with EPA Region V to modify the Consent Order to include Ohio as a party.

SANDIA NATIONAL LABORATORIES/ NEW MEXICO

Albuquerque, New Mexico

Field Office: DOE Field Office, Albuquerque

Size: 15,600 acres (approximately 57 square miles)

NPL Status: Not an NPL site.

Mission: Created by the Sandia Corporation in 1949, the primary function of the Sandia National Laboratories/New Mexico is the research and development of weapons which use nuclear explosives. This includes the design of the arming, fusing, and firing systems used in nuclear bombs and warheads. Other projects include nuclear reactor safety studies; development of safe transport and storage systems for special nuclear material including plutonium and uranium; radioactive waste disposal techniques and site studies; pulsed power research; vertical axis wind turbine research; and fossil fuel and geothermal energy research.

**Overview of
Environmental
Conditions:**

On-site soil and groundwater contaminated with various chemical and radiological contaminants resulting from historical waste management and disposal practices.

Funding in FY 92: \$11,741,000

Sandia National Laboratories/New Mexico is not listed on the NPL. Remediation of environmental conditions has been initiated as a result of RCRA permit issued by EPA which includes corrective action requirements.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

RFI activities at Sandia National Laboratories/New Mexico were initiated as a result of corrective action requirements in a RCRA permit issued by EPA.

During Calendar Year 1992, the RFI Work Plan for TA-2 was being prepared for submittal to the regulators. Field work under the Interim RFI Work Plan was accomplished. RFI Work Plan background investigations and draft document were completed for septic tanks and drain fields. The Mixed Waste Landfill Phase 2 RFI Work Plan was submitted to DOE for internal review. The Closure Plan for the Chemical Waste Landfill was revised with comments received from the State of New Mexico and was resubmitted to the State.

SANDIA NATIONAL LABORATORIES/ CALIFORNIA

Livermore, California

Field Office: DOE Field Office, Albuquerque

Size: 413 acres

NPL Status: Not an NPL site.

Mission: Established in 1956 to provide support services to the neighboring Lawrence Livermore National Laboratory. Sandia National Laboratories/California's initial mission was to provide ordnance engineering services to Lawrence Livermore National Laboratories. Current programs being carried out at Sandia National Laboratory-Livermore include nuclear weapons systems development and combustion, solar, and fusion research. The site was initially developed by the U.S. Navy in 1942 and later relinquished for DOE activities in 1956.

**Overview of
Environmental
Conditions:**

Potential soil and groundwater contamination from a diesel fuel leak; and historical land disposal practices.

Funding in FY 92: \$4,329,000

Sandia National Laboratories/California is not listed on the NPL. Remediation of environmental conditions is being addressed under authority of a State of California Cleanup Order.

Progress in Conducting Remedial Actions at Facilities Not on the NPL

On October 15, 1987 a PA/SI was submitted to EPA in response to CERCLA 120 requirements. To date, EPA has not completed a hazard ranking score.

In December, 1989, the State of California Regional Water Quality Control Board (RWQCB) issued DOE and the Sandia Corporation a Site Cleanup Order (No. 89-184) which modified Order 88-142 requiring the consolidation of all site work to be accomplished by the Sandia Corporation and DOE, and set forth provisions and specifications for development and implementation of soil cleanup alternatives for identified areas of soil and groundwater pollution. Four areas of potential soil and groundwater pollution were identified in the Cleanup Order: Trudell Auto Repair Shop, Fuel Oil Spill, Navy Landfill, and Miscellaneous Sites. RIs at all four sites were completed in Calendar Year 1991.

Regarding the cleanup of the Fuel Oil Spill site, authorization to proceed as recommended with in-situ bioremediation was provided in December 1990. The Remedial Action Plan for the Fuel Oil Spill was submitted to the State of California for review in March 1992.

The Navy Landfill Solid Waste Water Quality Assessment Test report was submitted for review on June 29, 1990, as scheduled, recommending the "no action alternative." the RWQCB provided comments and the document is currently under revision. Activities are being implemented to address RWQCB concerns.

The Miscellaneous Sites investigation found contaminants present in concentrations far below regulatory guidelines. The report was submitted to the State of California recommending "no further action." The RWQCB has provided comments which are being addressed and actions are being implemented to address RWQCB concerns.

Remedial activities associated with the Trudell Auto Repair Shop were completed in September 1990 and the site was closed in December 1990.

TRACY PUMP AND SUBSTATION

Byron, California

Field Office:	Western Area Power Administration (WAPA)
Size:	Approximately 21 acres
NPL Status:	Not an NPL site.
Mission:	500/230 kV electrical substation.
Overview of Environmental Conditions:	Some on-site subsoil oil and creosol contamination under 230 kV yard. Very low potential for migration due to clays.
Funding in FY 92:	\$110,538

The Tracy Pump and Substation is not listed on the NPL. A portion of the Federal property is owned by DOE and the Department of the Interior (DOI).

Progress in Conducting Remedial Actions at Facilities Not on the NPL

A PA was submitted to both EPA and the State of California in July, 1990 for a portion of federally owned land at the Tracy location. The results of the PA identified an old landfill located on a portion of DOE's property. This finding in turn requires that a State of California authorized Preliminary Evaluation Assessment (PEA) be conducted on this portion of the Federal property. DOI is taking the lead in preparing the PEA with DOE as an interested party (since the State of California considers the site all under Federal ownership). The PEA for the old landfill was submitted to the State of California in November 1992.

AIM

Association for Information and Image Management

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Silver Spring, Maryland 20910
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2 of 2

III. STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO SECTION 120 OF CERCLA

Section 120(e)(5) requires that the annual Report to Congress "... shall also contain a detailed description on a State-by-State basis of the status of each facility subject to this section, including a description of the hazard presented by each facility, plans and schedules for initiating and completing response actions, enforcement status (where appropriate), and an explanation of any postponements or failure to complete response actions." These requirements are fulfilled in the following alphabetical listing (by State) of all DOE federally-owned facilities as well as non-Federal facilities where DOE's presence is such that it is generally perceived as having a significant controlling interest in the operation of the facility. This list, which was generated from the Docket (Update #7) is meant to be a comprehensive listing (through FY 92) of all DOE facilities subject to the reporting requirements of the CERCLA 120 report. Changes to this list are expected in the future as the on-going evaluation and inspection process proceeds at all facilities within the DOE complex. An expanded discussion of the status of remediation activities conducted at DOE facilities listed on the NPL as well as significant environmental activities conducted at select non-DOE sites may be found in the detailed site discussions presented in Section II.H. and II.I of this report respectively.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Arizona	Liberty Substation (WAPA)	On-site soil/chemical	PCB removal complete; final cleanup report being transmitted to EPA; and complete PA/SI in progress.
	Parker Dam**	On-site soil/chemical	Partial PA completed.
	Laboratory for Energy-Health Research (LEHR)	None known	Listed on Docket 2/5/93. PA to be conducted.
California	Lawrence Berkeley Laboratory	On-site soil and groundwater/chemical and rad	RFA completed; RFI Work Plan submitted; RFI initiated; classified as SEA.
	Lawrence Livermore National Laboratory - Main Site	On-site groundwater and soil/chemical	Proposed Remedial Action Plan submitted; Responsiveness Summary for public comments and Final ROD approved; Remedial Action Implementation Plan submitted; and draft Remedial Design Report No. 1 submitted.
	Lawrence Livermore National Laboratory - Site 300	On-site groundwater and soil/chemical and rad	IAG signed; Site-wide Remedial Investigation Report initiated; 2 interim ground water facility operated; letter report on 2 removal actions submitted.
	Naval Petroleum Reserve No. 1 and 2	On-site soil/chemical	Site characterized as NFRAP.
	Oxnard Facility	On-site suspected soil and groundwater/ chemical	PA submitted 5/88.
	Sandia National Laboratories/ California	On-site soil and potential groundwater/chemical	Awaiting regulators comments on submittals.

* Acronyms and abbreviations used in this table are found in Appendix A.

** This site is owned and operated by Department of Interior's (DOI) Bureau of Land Reclamation. It was erroneously identified as a DOE Facility in the Docket. The site is included in this report to avoid confusion.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
California (Continued)	Santa Susana Field Laboratories (Energy Technology Engineering Center)	On-site groundwater and soil/chemical and rad	PA/SI submitted; Draft HRS score and Phase I and II reports submitted; need for additional action under review.
	Stanford Linear Accelerator Center	On-site groundwater and soil/chemical; off-site PCB contamination	PA completed; RI/FS underway; classified as SEA.
	Tracy Pump and Substation (WAPA)	On-site soil/chemical	Preliminary Evaluation Assessment submitted.
Colorado	Anvil Points Facility, Naval Oil Shale Reserve No. 3	On-site soil	PA submitted; SI Plan requested by State.
	Grand Junction Project Office Remedial Action Project	On-site soil and groundwater/mixed waste	Classified as SEA.
	Montrose Power Operations Center (WAPA)	On-site soil/chemical	SI submitted; classified as SEA.
	National Renewable Energy Laboratory (formerly Solar Energy Research Institute)	None known	Classified as SEA.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Colorado (Continued)	Rocky Flats Plant	On-site groundwater, surface water, and soil/chemical, rad, mixed; off-site soil/rad	Progress on sitewide characteristic studies and reports; Historical Release Report completed; Sitewide Treatability Program submitted; Draft Annual Treatability Study Report completed; RI Report submitted; Fieldwork for RI completed; FS underway; RI Work Plan approved and Field Work initiated; RFI/RI Work Plan conditionally approved and Field Work initiated; 3 draft RFI/RI Work Plans completed and Field Work initiated; Draft Human Health Risk Assessment and 2 Technical Memorandums completed; Environmental Evaluation Survey completed; 7 Final RFI/RI Work Plans completed; Optimal Interim Action Work Plan developed; no further Action Document submitted; and Pilot Test Plan for interim remedial action.
Connecticut	Knolls Atomic Power Laboratory, Windsor Site	None known	Classified as SEA; no further EPA action required.
Florida	Pinellas Plant	On-site soil and groundwater and off-site groundwater/chemical	5 RFI reports approved; 1 Site Assessment Report completed; classified as SEA.
Hawaii	Sandia National Laboratories - Kauai Test Facility	None known	Listed on Docket 2/5/93; proposed for removal from Docket.
Idaho	Idaho National Engineering Laboratory	On-site groundwater and soil/chemical and rad	57 no Further Action Determinations approved; 4 Interim Action RODs signed; 4 Draft RI/FS Work Plans submitted; 3 RODs signed; 2 Draft RI/FS submitted; 1 Interim Action ROD submitted; 1 Pilot Plant report submitted; 1 Preliminary/Prefinal Remedial Design submitted; 1 Remedial Action Work Plan submitted; 2 Draft RIs submitted; 1 Draft RI/FS SOW submitted; and 21 RI/FS petroleum tanks removed.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Illinois	Argonne National Laboratory - East	On-site groundwater and soil/chemical and rad	PA/SI submitted; remedial actions will begin after issuance of RCRA Permit.
	Fermi National Accelerator Laboratory	On-site soil and groundwater/chemical	Preliminary risk assessment for PCB cleanup completed 2/19/93; classified as SEA.
Iowa	Ames Laboratory	Off-site soil/rad	RI work plan submitted 1/93.
	Hinton Hazardous Waste Storage Facility (WAPA)	On-site soil/chemical	Classified as SEA.
Kentucky	Paducah Gaseous Diffusion Plant	On-site soil/chemical; off-site groundwater/ chemical and rad absorbed dose; off-site fish/PCBs	Phase II Report on Site Investigation complete; UST RI/FS completed; Interim Corrective Measures Work Plans for 4 WAGs submitted to regulators; and classified as SEA.
Louisiana	Weeks Island (SPRO)	None known	Determination made by EPA Region VI on 9/16/91 that no PA/SI required; classified as SEA.
	West Hackberry Site (SPRO)	None known	Determination made by EPA Region VI on 9/16/91 that no PA/SI required; classified as SEA.
Missouri	Kansas City Plant	On-site soil, groundwater and air/chemical	Fieldwork completed for 6 RFIs; 1 CMI Work Plan approved.
	St. Louis Site (St. Louis Airport Site, Latty Avenue Properties and Vicinity Properties)	On-site soil and groundwater/primarily rad with limited chemical; off-site soil and sediments/rad	RI/FS & EIS public meeting held 1/92; RI approved by EPA; FS under preparation.
	Weldon Spring Site Remedial Action Project	On-site and off-site soil and groundwater/ chemical and rad	One RI/FS completed; documents supporting the Draft RI/FS - EIS for the Chemical Plant completed and submitted for public and Agency review (review period 12/20/93 to 2/19/93); an IAG was signed 6/30/92 and an amendment is currently awaiting signature by DOE, EPA and the State of Missouri.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Montana	Component Development and Integration Facility		PA/SI & HRS submitted; MSE test facility portion deleted from Docket (no remedial action anticipated).
	Hot Springs Substation TLM Complex	Soil and groundwater chemical contamination	Listed on Docket 12/12/91; PA prepared.
Nebraska	Foundry Site (WAPA)	Suspected lead contamination	PA/SI completed.
Nevada	Nevada Test Site	On-site soil and groundwater/rad	HRS package resubmitted; 1 Closure Plan approved and 2 submitted; and continued progress on the Groundwater Characterization Project.
	Tonopah Test Range	On-site soil/rad	Classified as SEA; PA to be prepared.
	Yucca Mountain Site	None known	Listed on Docket 2/5/93. PA to be prepared.
New Jersey	Maywood Site	On-site and off-site soil/rad and potential chemical contamination; approximately 57 vicinity properties rad contaminated; groundwater contamination beneath the pile; off-site sources	FS-EIS issued as draft 11/30/92; RI report submitted and accepted by regulators 12/17/92; baseline Risk Assessment issued as Final Draft 1/28/93; additional groundwater characterization initiated.
	Middlesex Sampling Plant	On-site soil/rad	Evaluations for removal actions planned for FY 94.
	New Brunswick Laboratory	On-site soil/rad	Evaluations for removal actions planned for FY 94.
	Princeton Plasma Physics Laboratory	On-site groundwater	Listed on Docket 2/5/93.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
New Jersey (Continued)	Wayne Site	On-site soil/rad and potential chemical contamination; off-site soil/minimal rad contamination; groundwater contamination beneath pile; potential off-site sources	Analytical results in support of RI obtained; public information center opened to provide information on RI/FS progress; off-site removal action completed; and all RI/FS milestones met.
New Mexico	Gasbuggy	None known	Classified as SEA.
	Gnome-Coach	None known	Site included in Nevada Test Site Phase I Report; expected to be subject to new HRS scoring.
	Los Alamos National Laboratory	On-site soil/chemical and rad	RFI work in progress; D&D of subsurface reactor completed.
	Lovelace Inhalation, Toxicology Research Institute	On-site soil/chemical and rad; groundwater/ chemical	Classified as SEA.
	Ross Aviation, Inc.	On-site soil/chemical	PA due 6/12/93;
	Sandia National Laboratories/New Mexico	On-site soil and groundwater/ chemical and rad	RFI initiated; Field Work under Interim RFI Work Plan accomplished; draft RFI completed; RFI Work Plan submitted to DOE; and Closure Plan revised and resubmitted.
	Waste Isolation Pilot Plant	None known	Listed on Docket 2/5/93.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
New York	Brookhaven National Laboratory	On-site groundwater and soil/chemical and rad	IAG executed; 1 RI/FS Work Plan approved and Field Work underway; RI/FS schedule submitted; Site Baseline Report submitted; SWMU Classification Report submitted; historical site review initiated; and 4 Removal Actions planned or underway.
	Colonie Site	On-site soil/rad and chemical	Classified as SEA.
	Knolls Atomic Power Laboratory, Niskayuna and West Milton Sites	Minor soil and groundwater contamination/chemical and rad	PA/SI submitted; EPA Region II evaluation in progress.
	Niagara Falls Storage Site	None known	PA completed 5/90; used for long-term radioactive storage; evaluating alternatives for final disposition.
	West Valley Demonstration Project	None known	Listed on Docket 2/5/93; PA being prepared.
Ohio	Fernald Environmental Management Project (formerly Feed Materials Production Center)	On-site and off-site soil and groundwater/rad	27 Removal Actions complete or underway; expedited Silo 2 removal action completed 1/92; Waste Pit Area run-off control project completed ahead of schedule in 6/92; Pit 5 Experimental Treatment Facility removal action completed ahead of schedule 3/92; Control Exposed Material Pits field work initiated 9/92; Waste Pit Area Containment field activities initiated 10/92; 7 Removal Action Work Plans approved; 5 Removal Actions complete; 2 Treatability Study Work Plans approved; 1 EE/CA submitted; 1 Risk Assessment Work Plan approved; and 1 Site-wide Characterization report submitted.

* Acronyms and abbreviations used in this table are found in Appendix A.

TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA*

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Ohio (Continued)	Mound Plant	On-site soil, on-site and off-site groundwater/chemical and rad	Assessment activities have begun at 5 of the 7 operable units in FY 92.
	Perry Nuclear Power Plant	None known	Listed on Docket 2/5/93.
	Portsmouth Gaseous Diffusion Plant	On-site soil and groundwater/chemical and rad	1 RFI Report completed; 1 CMS Work Plan completed; 1 RFI Work Plan approved; and 2 closures completed.
Oklahoma	National Institute for Petroleum and Energy Research	On-site soil/chemical	Listed on Docket 2/5/93.
Oregon	Alvey Maintenance Headquarters (BPA)	On-site soil/chemical	Site Characterized as NFRAP.
	Bake Oven Substation (BPA)	Potential PCB contamination	Listed on Docket 2/5/93; PCB cleanup underway.
	Ceilo Converter Station (BPA)	On-site soil/chemical	Listed on Docket 2/5/93.
	Ostrander Substation (BPA)	On-site chemical	Listed on Docket 2/5/93; cleanup of reportable spill performed.
	Troutdale Substation (BPA)	On-site soil/chemical	Site Characterized as NFRAP.
Pennsylvania	Bettis Atomic Power Laboratory, West Mifflin	Minor soil and groundwater contamination/chemical and rad	Classified as SEA; no further EPA action required.
	Pittsburgh Energy Technology Center	On-site soil and groundwater	Site wide soil and analysis program to identify and characterize potentially contaminated areas; groundwater monitoring network in final stages of installation.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Puerto Rico	Center for Energy and Environmental Research	On-site soil/rad	PA submitted 5/16/88; decommissioning in progress.
South Carolina	Savannah River Site	On-site groundwater, soil and air/chemical and rad	IAG executed; 23 RFI/RI plans submitted; 3 proposed RFI/RI plans submitted; 1 baseline risk assessment submitted; 3 Interim Action RODs approved; 22 Site Evaluation Reports submitted; 1 RCRA closure certified; and 2 proposed RCRA closure plans submitted.
South Dakota	Watertown Maintenance Facility (WAPA)	On-site potential soil/chemical	PA submitted 5/90; SI submitted 10/91.
Tennessee	K-25 (Oak Ridge Gaseous Diffusion Plant)	On-site groundwater, soil and surface water/chemical and rad	IAG executed; 2 RI Work Plans submitted; 1 RI/FS Report submitted; 1 Remedial Action Plan submitted; 1 Interim Remedial Action Plan Submitted; and 1 Interim Action ROD completed.
	Oak Ridge Associated Universities	On-site groundwater, soil and surface water/chemical and rad	IAG executed.
	Oak Ridge National Laboratory	On-site groundwater, soil and surface water/chemical and rad	IAG executed; 1 RI Work Plan submitted; 1 RI/FS Report submitted; 1 FS Report submitted; 1 Interim Measures Study submitted; 3 Interim Remedial Action Plans submitted; and 2 Interim Action RODs completed; and work underway at ORNL Cesium Plots and White Wing Scrap Yard.
	Off-Site Clinch River	On-site groundwater, soil and surface water/chemical and rad	IAG executed; 1 RI Work Plan submitted; and RI field work underway at Clinch and Tennessee Rivers.

- * Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Tennessee (Continued)	Y-12 Plant	On-site groundwater, soil and surface water/chemical and rad	IAG executed; 3 RI Work plans submitted; 3 RI Reports submitted; 1 FS Report submitted; 2 Interim Remedial Action Plans submitted; 1 Remedial Action Plans submitted; 1 ROD completed; RI fieldwork underway at East Fork Poplar Creek; and construction of cap at United Nuclear Site Mercury Tank remediation underway 12/92.
Texas	Big Hill Site (SPRO)	On-site soil/chemical	Determination made by EPA Region VI, on 9/16/91 that no PA/SI required; site characterized as NFRAP.
	Pantex Plant	On-site soil and groundwater/chemical and rad	Proposed for NPL 7/29/91; 7 RFI Work Plans approved. Corrective action activities being conducted under 3008(l) consent order.
Utah	Monticello Mill Site and Vicinity Properties	On-site and off-site groundwater, soil and surface water/chemical and rad	Remedial actions completed on 89 more of the 410 vicinity properties (194 total); continuing remedial design and remedial action for other vicinity properties and the remediation of the mill site; and an RI/FS Work Plan approved for the Mill Site.
Washington	Columbia Basin Project AEC Zone 2,4-D Site	On-site soil/chemical	Deletion from Docket requested.
	Columbia Substation (BPA)	On-site soil/chemical	Site characterized as NFRAP.
	Cosmopolis (BPA)	Potential PCB contamination	Listed on Docket 2/5/93; cleanup of reportable spill performed.
	Covington Substation (BPA)	On-site soil/chemical	SI requested and currently in progress; removal action completed and report submitted.
	G.H. Bell Substation and Maintenance Complex (BPA)	On-site soil/chemical	Site characterized as NFRAP.

* Acronyms and abbreviations used in this table are found in Appendix A.

**TABLE III-1
STATE-BY-STATE STATUS OF DOE FACILITIES SUBJECT TO CERCLA***

STATE	DOE FACILITY	KNOWN OR SUSPECTED PROBLEMS	CURRENT STATUS
Washington (Continued)	Hanford Site	On-site groundwater and soil/chemical and rad	Revision 2 of IAG published; 2 ERAs completed; 6 ERA project plans submitted to regulators; 3 RI/FS Work Plans submitted; 13 RI/PS Work Plans approved; RI Phase Reports submitted; and 3 FS Phase Reports submitted
	Lapine (BPA)	On-site soil/chemical	PA submitted; under compliance schedule to modify substation
	Maple Valley Substation (BPA)	On-site soil/chemical	PA submitted.
	Monroe (BPA)	On-site chemical	Listed on Docket 2/5/93; cleanup of reportable spill performed.
	Midway Substation (BPA)	On-site soil/chemical	SI Report submitted; Cleanup completed and report submitted; and monitoring well installation complete.
	Olympia Substation (BPA)	On-site soil/chemical	SI requested and currently in progress.
	Port Angeles (BPA)	On-site chemical	Listed on Docket 2/5/93; cleanup of reportable spill performed.
	Ross Complex (BPA)	On-site soil and potential groundwater/chemical	Draft RI issued; Draft FS issued; Draft proposed plan issued; RI Phase II completed; Draft ROD issued; and Draft RI report issued.
	Snohomish Substation (BPA)	On-site soil/chemical	SI requested and currently in progress.
West Virginia	Morgantown Energy Technology Center	On-site soil and potential groundwater/chemical	PA/SI initiated; providing additional data to EPA preparatory to HRS Scoring
Wyoming	Casper Field Branch (WAPA)	None known	PA/SI completed; classified as SEA.
	Hoe Creek	On-site groundwater/chemical	PA/SI initiated; interim pump and treat action completed; and proposed agreement with State drafted.

* Acronyms and abbreviations used in this table are found in Appendix A.

IV. ONGOING RESEARCH AND DEVELOPMENT EFFORTS FOR REMEDIAL TECHNOLOGIES

A. General Description and Goals of Department of Energy's Research, Development, Demonstration, Testing and Evaluation (RDDT&E) Efforts for Development of Innovative Remedial Technologies

DOE is committed to a goal of completing environmental cleanup of its facilities by the year 2019. To successfully achieve this goal at the lowest possible cost, DOE will develop and rapidly implement new technologies consistent with all applicable requirements. In developing new technologies to improve Waste Management and Environmental Restoration operations, the Office of Technology Development (EM-50) was created within the office of Environmental Restoration and Waste Management (EM) to: (1) establish the means to identify and prioritize needed technology development activities; (2) aggressively use all internal and external resources to find solutions; and (3) rapidly transfer those solutions to DOE and other users.

The principal mission of EM-50 is to provide new technologies by increasing investment in and improving the management and coordination of EM's technology development activities. This mission is pursued in close cooperation with other EM Offices and by using all internal and external resources available. The overall goals of EM-50 are to become the international leader in technology development for environmental restoration and waste management, adopt technology from industry and apply it to DOE problems, export technology developed under DOE funding to commercial waste management, expand the talent pool for site cleanup and waste management through significant support of education in science and technology, and provide effective support to EM in the identification and resolution of technology needs. Attainment of these goals will help achieve compliance, stimulate the U.S. economy, facilitate site remediation, and reduce waste generation, waste disposal volume, overall costs, and risks.

EM-50 relies primarily on the existing national laboratory and contractor system as well as newly formed partnerships with industry, universities and other Federal agencies to develop new and improved technologies. DOE relies on this system due to the system's extensive technical capabilities (particularly in radiological areas), close ties with operating sites, and the longstanding role in DOE research programs. Through technology transfer, EM-50 is able to adapt existing solutions from industry, other Federal agencies, international organizations, and universities. To facilitate and accelerate development of innovative solutions, EM-50 has established partnerships with these groups by publishing summaries of ongoing DOE research, soliciting team proposals, issuing Research Opportunity Announcements (ROAs) and Proposed Research and Development Announcements including collaborative R&D with private sector partners using Cooperative Research and Development Agreements (CRADAs).

Innovative technologies that are developed at sites with regulatory compliance and cleanup agreements are conducted as part of treatability studies. Once an innovative technology has been developed and proven or has been successfully implemented at a site, EM-50 will make it available to outside organizations. The strategy for achieving successful transfer of technologies to other DOE sites and Federal agencies is to promote joint Integrated Demonstrations of technology systems in key technology areas and to develop an industry capability which can service the DOE user community. In addition, Integrated Programs have been organized to provide a cost-effective, coordinated, and comprehensive technology development effort focused on specific types of technology areas.

To ensure that the technical workforce is available, EM has support programs to educate current and future workers in the emerging scientific disciplines and to attract future workers into the environmental field. An integrated education and outreach program in science and technology involving universities, primary and secondary schools, and the public has been established with the objective of assuring that the technical workforce is well trained and will continue to be available to accomplish EM's cleanup mission.

Compliance with applicable Federal, State, local, and Tribal statutes and regulations is a top priority of EM. Throughout the process of research, development, demonstration, testing, and evaluation of new and innovative technologies, EM-50 identifies and takes action to comply with all applicable regulatory requirements. This will ensure that newly developed technologies are fully acceptable to both the users and regulators.

B. Activities Accomplishments

GROUNDWATER AND SOILS CLEANUP

The most pressing technology needs for environmental restoration involve the cleanup or containment of radioactive and hazardous waste in groundwater and soils. Sources of contamination of soils and groundwater include the following: previous disposal of wastes in ponds, seepage pits and trenches, and shallow land burial sites; spills and leakage from waste transport and storage facilities such as underground tanks; and discharges to the air and surface waters. FY 92 groundwater and soils cleanup activities focused on technologies and technology systems to characterize contaminated sites and to provide more cost effective methods for in-situ cleanup of DOE sites. Activities included the evaluation of interim or temporary measures to slow migration or contain radioactive and hazardous material until a suitable technology can be developed. Table IV-1 provides an overview of the major groundwater and soils cleanup technology development activities for FY 92.

**TABLE IV-1. OVERVIEW OF GROUNDWATER AND SOILS CLEANUP
TECHNOLOGY DEVELOPMENT ACTIVITIES IN FY 92**

Program	Activity	Location	Purpose
Volatile Organic Compounds (VOCs) in Non-Arid Soils	Integrated Demonstration	Savannah River Site Aiken, SC	Develops, demonstrates, and compares technologies to characterize, remove, destroy, and monitor VOCs in soils and groundwater at non-arid sites.
VOCs in Arid Soils	Integrated Demonstration	Hanford Operations Richland, WA	Develops, demonstrates, and compares technologies to characterize, remove, destroy, and monitor VOCs in soils and groundwater at arid sites.
Plutonium-Contaminated Soil	Integrated Demonstration	Nevada Test Site Mercury, NV	Develops and tests physical systems for cleanup of large surface areas contaminated with plutonium.
Uranium-Contaminated Soil	Integrated Demonstration	Fernald Environmental Management Project, Fernald, OH	Develops cost-effective system to remediate low levels of uranium contamination over large areas.
Mixed Waste Landfill	Integrated Demonstration	Sandia National Laboratories, Albuquerque, NM	DT&E of characterization and stabilization cleanup technologies for soils contaminated with volatile and non-volatile organics, metals, and radionuclides.
In-Situ Remediation Technology	Integrated Program	Activities to support sites across the DOE complex.	R&D on the treatment in place of contaminated soil and groundwater and the containment of contaminants to prevent their spread.
Characterization, Monitoring, and Sensor Technology	Integrated Program	Activities to support sites across the DOE complex.	Develops in-place soil-melting technology with potential broad applications to contaminated soils, buried waste, and underground structures.
Dynamic Stripping	Project	Lawrence Livermore National Laboratory, Livermore, CA	Rapid cleanup of gasoline spill, reducing disruption from decades to months.
Resources Recovery	Project	Butte, MT	Demonstrate recovery of heavy metal contaminants from water with the resulting production of marketable resources.

The following are selected FY 92 accomplishments and are illustrative of those achieved in support of EM Office of Technology Development groundwater and soils cleanup activities:

- A demonstration that sonic drilling (e.g., tuned vibrating drill head) is three to five times faster than cable drilling - Schedules are accelerated where the drilling of monitoring and treatment wells are essential to cleanup operations. Sonic drilling not only reduces costs but also the amount of contaminated secondary water (such as drilling fluids) produced from the drilling process.
- An initiation of a full-scale in-situ bioremediation demonstration - This technology injects nutrients into the subsurface to stimulate microorganisms to break down VOCs (e.g., PCBs, TCEs, carbon tetrachloride). By eliminating the need to pump the

hazardous materials to the surface for treatment, bioremediation reduces human exposure to vapors, does not generate new secondary wastes, and saves energy costs.

- A demonstration of the feasibility of a cone penetrometer in arid soils - As it is pushed into the ground, the cone penetrometer rapidly collects geologic data thus allowing data to be collected continuously at each depth. Use of the cone penetrometer can reduce the cost of site characterization by 60 percent.
- Performance of an in-situ heating/corona destruction pilot test that exceeded expectations - Field in-situ heating tests are underway. This technology frees contaminants which are not easily removed by vapor extraction from clay-like soils.
- Performance of bench-scale tests of various technologies to separate plutonium surrogates from soils - Plutonium surrogates are nonradioactive materials physically similar to plutonium that are used for testing. In addition, innovative separation technologies to remove as many contaminants as possible, were investigated. These technologies reduce the amount of contaminated soils requiring treatment or storage at a land disposal site.
- A demonstration and field-test of four in-situ technologies for rapid on-site mapping of radionuclides in soil - these technologies include cone penetrometer sampling, geophysical characterization, expedited site characterization methodology, and field deployable instrumentation for analysis of organics. In-situ analysis is much faster and more cost-effective, providing accurate results "on the spot" and avoiding the cost of manual soil sampling and off-site analysis which can take up to three months to process.
- Placement of four landfill caps at Hill Air Force Base to contain contaminants in landfills - This operation involved extensive instrumentation to determine moisture movement and to determine effectiveness of landfill caps to prevent migration of contaminants into the surrounding environment.
- A demonstration (on a laboratory scale) of a method to concentrate heavy metals and radionuclides in soils using an electric current through the soil (i.e., electrokinetic extraction) - This technique can be applied to soil cleanup in-situ, thereby reducing costs and minimizing worker and community exposure hazards compared to excavate-and-treat methods.

- Development of carbon tetrachloride and fluid flow sensors to support DOE remediation activities - These sensors enable "real time" control and monitoring of in-ground activities thus providing optimal system performance and costs-effective remediation.
- Testing and fabricating of off-gas treatment prototype units - These units are expected to provide a less expensive means of destroying the gaseous forms of contaminants extracted from the soil and groundwater. They will also eliminate the need to transport hazardous materials off-site, thus eliminating potential health and safety risks.
- A demonstration (at a clean site) of the potential effectiveness of steam stripping and electrical heating for removal of VOCs from soils - Based on results from the clean site demonstration, the electrical heating phase of the project was initiated at a Lawrence Livermore National Laboratory gasoline spill to demonstrate the enhanced gasoline removal resulting from electrical heating.

WASTE RETRIEVAL AND WASTE PROCESSING

Waste retrieval and waste processing constitute the largest EM program. Activities focus on retrieving and processing hazardous, radioactive, or mixed waste resulting from current DOE weapons complex operations; treating buried or stored waste from more than one million 55-gallon drums in storage and from more than 200 large underground storage tanks; and the D&D of more than 500 inactive surplus facilities. Existing waste retrieval and processing technologies are often inadequate and expensive.

FY 92 waste retrieval and processing activities focused mainly on technologies and technology systems to deal with mixed waste residing in drums buried in soil or contained in underground storage tanks. Also, RDDT&E activities to support EM D&D efforts were initiated. Table IV-2 provides an overview of the major waste retrieval and waste processing RDDT&E programs for FY 92.

The following are selected FY 92 accomplishments and are illustrative of those achieved in support of EM Office of Technology Development waste retrieval and processing activities:

- Completion of pilot-scale testing of buried and stored mixed waste treatment plasma furnace and commencement of testing on an arc plasma pilot unit - Both the furnace and arc plasma units will be used to melt mixed waste into solid forms which are safe to store. Plasma arc treatment applies high heat to the soil to destroy organic compounds and create a solid, stable, glass-like materials in which inorganic contaminants are immobilized. This technology presents significant costs savings over

current technologies because different contaminants can be immobilized at the same time.

TABLE IV-2. OVERVIEW OF WASTE RETRIEVAL AND WASTE PROCESSING TECHNOLOGY DEVELOPMENT ACTIVITIES IN FY 92

Program	Activity	Location	Purpose
Buried Waste Retrieval and Processing	Integrated Demonstration	Idaho National Engineering Laboratory, Idaho Falls, ID	Develops a system to remediate DOE weapons complex-wide buried mixed, transuranic, and low-level waste.
Underground Storage Tanks	Integrated Demonstration	Hanford Operations, Richland, WA	Develops technologies to remediate underground storage tanks containing high-level, low-level, transuranic and mixed waste at DOE sites.
Efficient Separations and Processing	Integrated Program	Activities to support sites across the DOE complex.	Provides improved options for processing radioactive wastes to minimize waste volumes and environmental, health, and safety risks; to develop stable waste forms for disposal; and to reduce waste management costs.
Mixed Waste and Hazardous Waste Treatment	Integrated Program	Activities to support sites across the DOE complex.	Develops technologies to detect, treat, store and dispose DOE-generated mixed hazardous and radioactive waste.
Decontamination and Decommissioning	Integrated Demonstration	K-25 Site, Oak Ridge National Laboratory, Oak Ridge, TN	Develops technologies and techniques to reduce worker exposure and costs, and the generation of waste during decontamination and decommissioning of contaminated facilities.
Supercritical Water Oxidation	Program	Idaho National Engineering Laboratory, Idaho Falls, ID	Demonstrates a system to remediate DOE weapons complex-wide mixed and hazardous waste using supercritical water oxidation.

- Development of a process to destroy nitrates and immobilize residues in one step in order to reduce waste volume - this process provides information concerning waste composition by a single-stage procedure and significantly reduces the expense and time required for traditional multi-stage procedures involving physical sampling, shipment in special containers, and off-site laboratory analysis.
- Assemblage of a field-deployable rapid monitoring unit that conducts near real-time analyses of alpha-emitting radionuclides, including plutonium, released when mixed wastes are retrieved from burial sites - this is a portable unit which can be moved from site to site to provide early detection of alpha particles. It enhances worker safety and protection of the environment.
- A demonstration that cryogenic retrieval of buried waste minimizes the amount of dust released when waste is retrieved - this retrieval process reduces the amount of potential airborne contamination.

- A demonstration that fiber-optic sensor measuring technology and ultrasonic detection of sludge layers in underground storage tanks assists in better characterization of waste tank contents - the technology decreases space requirements for storage and disposal in specially designed expensive facilities, thereby decreasing costs and worker exposure to ionizing radiation and hazardous waste.
- Completion of bench-scale testing of a silent plasma discharge unit used to destroy VOCs contained in gas streams - this technology holds significant value for use in incineration and other thermal treatment methods to aid compliance with increasingly stringent clean air requirements.
- A demonstration of a surface decontamination method (a microwave method for concrete surfaces) on laboratory test pieces - this method generated less secondary waste than the current baseline methods (breaking up concrete surfaces using mechanical equipment and blasting metal surfaces with water and/or abrasive). This reduction in secondary waste generation could lead to an overall reduction in the implementation cost of surface decontamination methods.
- Continuation of development of sequestering agents (i.e., molecules that can extract specific contaminants) to selectively extract actinides and other hazardous metal ions - this technology is less expensive than current precipitation methods and can be used to meet more stringent wastewater discharge requirements, and decrease waste disposal costs.

WASTE MINIMIZATION AND WASTE AVOIDANCE

DOE has developed a comprehensive waste minimization program with the goal of eliminating or minimizing waste generation at the source as well as recycling materials as much as possible. In this regard, DOE has entered into a number of IAGs with milestones that can only be reached by the development and implementation of new technologies.

Waste minimization and waste avoidance activities involve the integration of new technologies and technology systems into processes to reduce the toxicity or amount of hazardous and/or radioactive materials at the source, and to reduce the toxicity and volume of waste for disposal through recycling, reuse, and treatment. These technologies and systems are applicable to a broad range of manufacturing efforts.

Table IV-3 provides a overview of the major waste minimization and waste avoidance Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) programs for FY 92.

TABLE IV-3. OVERVIEW OF WASTE MINIMIZATION AND WASTE AVOIDANCE TECHNOLOGY DEVELOPMENT ACTIVITIES IN FY 92

Program	Activity	Location	Purpose
Alloy Control for Recycle	Integrated Program	Oak Ridge National Laboratory/Y-12 Site, Oak Ridge, TN	Evaluation of metal handling technology, from production to recycle.
Environmentally Conscious Manufacturing of Electronics Components	Integrated Demonstration	Sandia National Laboratories, Albuquerque, NM	Cost effectively eliminates waste in the manufacture of electronic and electromechanical components.
DOE-U.S. Air Force Memorandum of Understanding	Memorandum of Understanding	Activities to support DOE and Air Force sites	Leverages DOE and U.S. Air Force resources to eliminate chlorinated solvents in metals preparation, paint stripping, plating, and cleaning operations.
Waste Component Recycle, Treatment, and Disposal	Integrated Demonstration	Sandia National Laboratories, Albuquerque, NM	Demonstrate recycle, treatment, and disposal processes and technologies to reduce waste from weapons dismantlement.

The following are selected FY 92 accomplishments and are illustrative of those achieved in support of EM Office of Technology Development waste minimization and waste avoidance activities:

- A demonstration of cold fracture techniques with a forge hammer that break up weapons components for separation, recycling, and pretreatment - this technology was almost cost- free and has been very successful in the recycling, treatment, and disposal of material resulting from the demilitarization of weapons.
- A demonstration of a water-jet cutting device that removes hazardous and radioactive portions of components and to segregate wastes during the recycle of weapons - this device has shown significant cost savings over conventional methods.
- Completion of waste characterization studies to use D-limonene, a non-hazardous solvent, to produce electronic printed wiring boards - this research indicates that non-hazardous solvents can be substituted into the DOE production processes to comply with Federal regulations.
- A demonstration of laser ablative cleaning and fluxless soldering on copper, aluminum, and kovar (an epoxy potting material) - laser ablative cleaning involves the use of very short pulses of high peak power laser radiation to vaporize thin layers of contaminants. Fluxless soldering eliminates solvents used for cleaning flux residue from printed circuit boards. This process produces less chemical waste than most industrial solvent cleaning processes, thereby contributing directly to DOE's waste minimization goals.

- A demonstration of the use of an on-line solvent substitution information handbook to DOE, other U.S. government agencies, and to industry - this resource can be used to locate suitable substitutes for toxic halogenated solvents and chlorinated solvents used in metal production and cleaning processes.

TECHNICAL INTEGRATION

EM-50 employs IAGs, Memoranda of Understanding (MOUs), and Memoranda of Agreements (MOAs) to collaborate with other agencies and other DOE organizations whose expertise and program resources complement the activities of EM-50 and lead to efficient solutions. EM-50 has conducted in-depth technology transfer reviews with the Air Force, Army, and the National Aeronautics and Space Administration (NASA) and patented a horizontal well drilling method. Additionally, EM-50 has also initiated the use of private sector technology for in-situ bioremediation of heavy metals in groundwater and evaluated the soil separation techniques for plutonium at DOE's Nevada Test Site.

ENVIRONMENTAL EDUCATION DEVELOPMENT

EM-50 has created academic partnerships with the Waste Management Education Research Consortium (WERC), the Historically Black Colleges and Universities Minority Institutions (HBCU/MI), and the South Carolina Universities Research and Education Consortium (SCUREC), and provided undergraduate scholarships, graduate fellowships, and faculty awards directed in environmental activities. EM-50 has also completed a manpower needs assessment of the numbers and skills of the Department's workforce to validate existing education programs and to establish a baseline for future such programs.

REGULATORY ACCEPTANCE: A KEY TO SUCCESSFUL IMPLEMENTATION

Over the past twenty years, Congress has enacted a number of laws such as RCRA, CERCLA, and NEPA to protect the environment. These laws have a significant impact on technology development activities. Among other requirements, these laws mandate technology performance standards, set forth remedial process criteria for technology selection, and prescribe evaluation of potential environmental impact from technology development activities. DOE made a commitment to conduct all activities in compliance with both the letter and the spirit of these laws.

The EM Office of Technology Development seeks to identify applicable laws and regulations, analyze the legal requirements affecting EM technology development activities, and develop the programmatic infrastructure to ensure those legal requirements are an integral element of the EM RDDT&E process.

The following are illustrative of FY 92 accomplishments:

- **Environmental Assessment and Finding of No Significant Impact - Completed NEPA review for the Environmental Molecular Science Laboratory at the Hanford Site.**
- **Categorical Exclusions - Approved for numerous projects including Invasive Subsurface Barriers for Prevention of Continued Migration of Contaminants in Groundwater; Remote Fiber Optic Thermoluminescence Dosimeter Monitoring System for Radionuclides in Soil; and Selective Chelation/Extraction of Lanthanides and Actinides with Lariat-Crown Ethers in Supercritical Fluids.**
- **Self-Assessment Program - Commenced planning and preparation for instituting the EM Self-Assessment Program, which will include evaluation and reporting of environment, safety, and health compliance status and activities for all EM Office of Technology Development projects and programs.**

Assurance of regulatory compliance and achievement of regulatory acceptance necessitates close interaction with technology development customers and Federal and State regulators. An open exchange of information facilitates the permitting process, acceptance of innovative technologies, and regulatory oversight activities. The EM Office of Technology Development is vigilant in maintaining such information exchange. In FY 92, the Office began site-by-site reviews of compliance agreements with regulators and site personnel, to find interfaces between technology development activities and agreement requirements.

On an intra-agency level, the EM Office of Technology Development continued to participate in regulatory working groups to focus on cleanup issues such as uranium-contaminated soils and underground storage tanks, and to work closely with EM's Office of Oversight and Self-Assessment, which assesses EM's compliance with environmental regulations. The Office also continued to consult and coordinate its activities with the DOE Office of the Assistant Secretary for Environment, Safety, and Health to ensure that technology development activities are consistent with general DOE environmental compliance policy and guidance.

On an interagency level, this Office continued coordination of EM Federal interagency technical activities with EPA and participates in joint EPA, DOE, Department of Defense (DOD), U.S. Geological Survey, and U.S. Bureau of Mines regulatory coordination working groups and steering committees. The following are illustrative of FY 92 continued collaboration:

- **EPA - Collaboration on the Mine Waste Pilot Project, development of Hazardous Substances Research Centers, and participation in the Superfund Innovative Technology Evaluation Program.**

- **DOD - Development of plasma treatment technology, supercritical water oxidation technology, and spray forming technology.**

In FY 92, as part of the Western Governors' Association (WGA) initiative, the Federal Working Group began preparation of a report to identify regulatory barriers to technology development. This report will propose reforms to the regulatory system within the Federal governmental structure. Potential barriers might include:

- **Regulations and policies that provide incentives to use proven technologies rather than emerging technologies - The need to comply with the time schedules and compliance agreements imposed by Federal legislation, regulations, and policies can bias an agency's selection of technologies towards solutions that are time-proven, but less efficient or cost effective.**
- **Disincentives to wait for new remediation technologies - There is often an insistence on immediacy. This, in turn, precludes taking any chances on newer technologies which do not have established histories of successful use in similar problems and thus have higher risk of failure. In addition, conservative cleanup standards may be imposed that provide no consideration of the costs and benefits that would favor newer and less costly technologies which do not have an established record of compliance.**
- **Federal, State, and local government permitting and regulatory procedures are sometimes confusing and may be crafted with insufficient coordination among relevant agencies. To be consistent with the underlying regulations, most permit and compliance programs are specific to a single environmental medium such as air, soil, or water. With the mission of each environmental organization focused on a specific medium, laws and regulations have been developed that sometimes duplicate and contradict each other.**

Analytical Laboratory management provides EM environmental restoration and waste management programs with cost-effective sampling and analysis support to collect the credible environmental data required to comply with Federal facility compliance agreements and other environmental regulations. To accomplish this mission, the analytical laboratory management program develops quality assurance programs for sampling and analysis; ensures sufficient laboratory capacity to analyze radioactive, hazardous, and mixed waste samples for all EM programs; and is developing an EM-wide information management system for sample management.

The following are selected FY 92 accomplishments and are illustrative of those achieved in support of the EM Office of Technology Development analytical laboratory management activities:

- Completion of an analytical services five-year program plan with solicitation of public comment - this plan serves as a blue print to outline the Analytical Laboratory Management program goals and to communicate its needs to commercial analytical laboratories supporting DOE environmental cleanup sampling and analysis needs. Cost-effective private sector analytical laboratory support is critical to accommodate the large volume of analytical samples that DOE environmental cleanup activities are expected to generate.
- Development of models to project analytical needs for waste management and environmental restoration - Accurate long-term projections are required so that DOE and the private sector can plan and construct laboratory capacity required to meet DOE needs. The projections are also necessary to effectively allocate research dollars for new analytical methods and equipment.
- Development of a compendium of standard analytical methods for radioactive and mixed waste - Standard methods are required if analytical data are to be acceptable to regulators and the public.
- Development of a draft standard model contract for securing analytical services from the private sector - Standardized contracting will result in substantial cost savings and more consistent quality in analytical data.

Robotics Technology Development provides the development and deployment of applied robotics systems to address complex-wide problems and needs. This national program is focussed on: (1) reducing worker exposure and increasing worker safety through remote operation of equipment; (2) increasing productivity through automation and "intelligent machines;" and (3) reducing secondary waste generation by removing workers from hazardous waste areas.

The program pulls together multi-DOE-laboratory teams to work with industrial and university partners in several robotics application areas. Particularly significant FY92 accomplishments from three of the eight robotics application areas follow:

- Underground Storage Tanks - In FY91, a computer controlled laser and camera system was used to remotely map the surface topology of the uranium waste in storage tanks at the Fernald Environmental Management Project site in Ohio. This was done as part of a removal action requiring the emplacement of capping material over the waste to

prevent further radon emissions. A Structured Lighting System accurately and quickly produced a point-by-point grid of the waste surface. These data were used to enable the application of the cap uniformly over the waste contour. This resulted in reduction of the quantity of the capping material, which will eventually have to be treated as waste. The same robotics system was subsequently used to map the cap's contour. Comparison of the two maps verified that the cap met the minimum thickness requirement in the Ohio/EPA/DOE TPA. Radiation levels at the tanks' outer surface (an indicator of radon concentration) were reduced by 1,000 fold to virtually natural background levels. The estimated ratio of cost savings to development/ deployment is 12 to 1. In FY 92, a CRADA within the Robotics Program is transferring this technology to a private company. The system will be commercially available shortly for use in the Hanford facility tanks.

- **Contaminant Analysis Automation** - Systems are being developed to automate analytical chemistry procedures so as to process the immense number of samples necessary for DOE's environmental restoration and waste management efforts. Current DOE capacity to analyze samples is saturated, causing unacceptably long sample turnaround times and direction of projects with less than the required number of analyses. These and other problems will become worse as sampling requirements increase. The Robotics Contaminant Analysis Group is developing modular automated systems to perform a single standard step (e.g., filtration, concentration, extraction) which can be set up in assembly line fashion. Since all modules use the same communications/control scheme, they can "plug and play" to perform multiple analytical chemistry methods. In FY 92, the modules for running three EPA methods were built and tested. The EPA methods (extraction of organic compounds from soils, sludges, and other solids for identification and quantification) represent a large part of DOE's sample load and expose laboratory workers to chemically and radiologically hazardous materials. The modules are currently undergoing extensive engineering and data quality studies in preparation for EPA validation. This area has generated a very high level of private industry interest and cooperative agreements have been placed.
- **Crosscutting Applications** - Technologies that are commonly used by all robotics application areas are developed by a robotics crosscutting applications group. One application is the development of generic robotics control software to overcome limitations and inadequacies of commercially available high-level control packages. Lower-level control software from industries can be used off-the-shelf under the generic controller architecture. This group's generic approach (modular, re-usable, and easily transported software modules under a master controller) means that all Robotics Program groups can readily use each others' software tools, as all meet common standards. The simultaneous control of three robotics systems with multiple sensor, positioning, and characterization subsystems demonstrates the power of the generic

controller. The three systems were separately developed at different DOE sites and brought together for a technology demonstration. Cooperative agreements with commercial partners are in place and several companies have modified their controllers to be compatible, thus increasing the number of off-the-shelf options.

APPENDIX A

List of Acronyms and Abbreviations

AR	Administrative Record
ATSDR	Agency for Toxic Substances and Disease Registry
BPA	Bonneville Power Administration
BuRec	Bureau of Reclamation
CDH	Colorado Department of Health
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRADA	Cooperative Research and Development Agreement
CRP	Community Relations Plan
COCA	Consent Order and Compliance Agreement
CY	Calendar Year
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
DOJ	U.S. Department of Justice
DT&E	Demonstration, Testing and Evaluation
EA	Environmental Assessment
EE/CA	Engineering Evaluation/Cost Analysis
EH	Office of Environment, Safety and Health
EIS	Environmental Impact Statement
EM	Office of Environmental Restoration and Waste Management
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ER	Environmental Restoration
ERA	Expedited Response Actions
ERWM	Environmental Restoration and Waste Management
ES&H	Environment, Safety and Health
FEMP	Fernald Environmental Management Project
FFA	Federal Facility Agreement
FFA/CO	Federal Facility Agreement/Consent Order
FR	Federal Register
FS	Feasibility Study
FS/EIS	Feasibility Study/Environmental Impact Statement
FUSRAP	Formerly Utilized Site Remedial Action Project
FY	Fiscal Year
GAC	Granular Activated Carbon
GCP	Groundwater Characterization Project

APPENDIX A

List of Acronyms and Abbreviations

GSA	General Services Area
HBCC/MI	Historic Black Colleges and Universities Minority Institutions
HRR	Historical Release Report
HRS	Hazard Ranking System
HSPP	Health and Safety Program Plan
HSWA	Hazardous and Solid Waste Amendments
IAG	Interagency Agreement
ICM	Interim Corrective Measures
IHSS	Individual Hazardous Substance Site
INEL	Idaho National Engineering Laboratory
ID	Integrated Demonstrations
IM	Interim Measure
IRA	Interim Remedial Action
IP	Integrated Programs
LANL	Los Alamos National Laboratory
LBL	Lawrence Berkley Laboratory
LLNL	Lawrence Livermore National Laboratory
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSA	Major Systems Acquisition
MTCA	Model Toxics Control Act
NASA	National Aeronautics and Space Administration
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NOI	Notice of Intent
NPL	National Priorities List
O/IRAP	Optimum Interim Remedial Action Plan
ORAU	Oak Ridge Associated Universities
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OTD	Office of Technology Development
OU	Operable Unit
PA	Preliminary Assessment
PA/SI	Preliminary Assessment/Site Inspection
PCB	Polychlorinated Biphenyl
PEA	Preliminary Evaluation Assessment

APPENDIX A

List of Acronyms and Abbreviations

PETC	Pittsburgh Energy Technology Center
PPCD	Plan for Prevention of Contaminant Dispersion
PRDA	Program Research and Development Announcements
QAPP	Quality Assurance Project Plan
RAIP	Remedial Action Implementation Plan
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RDDT&E	Research, Development, Demonstration, Testing and Evaluation
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RFEDS	Rocky Flats Environmental Data System
RFP	Rocky Flats Plant
RI/FS	Remedial Investigation/Feasibility Study
RI/FS-EIS	Remedial Investigation/Feasibility Study - Environmental Impact Statement
ROA	Research Opportunity Announcement
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SAFER	Streamlined Approach for Environmental Restoration
SCDHEC	South Carolina Department of Health and Environmental Control
SCUREC	South Carolina Universities and Education Consortium
SEA	Site Evaluation Accomplished
SEC	Senior Executive Committee
SFMP	Surplus Facilities Management Program
SI	Site Inspection
SOW	Statement of Work
SPRO	Strategic Petroleum Reserve Office
SRS	Savannah River Site
SWMUs	Solid Waste Management Units
SWRI	Site Wide Remedial Investigation
TCE	Tetrachloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TPA	Tri-Party Agreement
TRG	Technical Review Group
TSCA	Toxic Substances Control Act
VOC	Volatile Organic Compounds

APPENDIX A

List of Acronyms and Abbreviations

WAGs	Waste Area Groups
WAPA	Western Area Power Authority
WGA	Western Governors' Association
WM	Waste Management
WMERC	Waste Management Education Research Consortium

APPENDIX B

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