# Major Accomplishments of the Environmental Restoration Project in Fiscal Year (FY) 2000

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# Introduction

The Environmental Restoration (ER) Project marked its 10th year with a host of significant accomplishments, validating the effectiveness of the previous year's re-engineering efforts. This accomplishments summary is organized by focus area, and each focus area had noteworthy accomplishments for the year. More detail on several of the projects is available on the ER Project's external web page at http://erproject.lanl.gov.

This year was exceptionally challenging when compared to all previous years due to the impact of the Cerro Grande fire on the priorities of the ER Project, the entire Laboratory, and Los Alamos County residents. Projects, like preparing and reporting on the risk assessment in Acid Canyon, started the year at the top of everyone's priority list. But, by May 22, 2000 with the Cerro Grande fire 90% contained, townsite residents were returning home and Laboratory employees were returning to work. People were concerned about homes that had been destroyed by fire. They were concerned about stormwater runoff demolishing the Trinity Bridge or the land bridge across Pueblo Canyon on Diamond Drive. They were concerned about the possibility that contaminants could be washed down from potential release sites and along canyons to the Rio Grande.

There were many questions and concerns regarding the effects of the fire and the possibility of historic-scale flooding on potential release sites, and the ER Project immediately shifted its priorities to address these concerns. In fact, people from the ER Project began working on these issues while the fire was still raging, and they have continued throughout the year to answer the questions and solve the problems raised by the fire. Despite the shift in priorities, the ER Project made significant accomplishments that do not relate to the fire.

If you have questions or comments about a specific accomplishment or focus area, please contact Carmen Rodriguez, Team Leader for Communications and Outreach, at 505-665-6770 or by e-mail at carmenr@lanl.gov.

# Project Management

## *Baseline Activities Accomplishments*

- Addressed watershed-based; high-risk sites first
- Prepared $1.548B Lifecycle ending 2013
- Received notification of validation by the Department of Energy on August 22, 2000
- Baseline team received Distinguished Performance Award (September 2000)

*Los Alamos National Laboratory*

*Distinguished Performance Award*

*In recognition of the:*

**ENVIRONMENTAL RESTORATION PROJECT**
**BASELINE DEVELOPMENT**

***Large Team***
***Distinguished Performance Award***
***September 2000***

# Project Management

## *High Performance Teams*

High performance teams were formed to promote a cooperative partnership for communication, decision-making, and remediation goal accomplishment at complex sites.

**Who:** Department of Energy, New Mexico Environment Department, Los Alamos National Laboratory Staff

**What:** Focus on high-priority, critical-path work

**How:** Expedite decision process

- Participating up-front with regulators
- Eliminating surprises
- Reducing cycle of paperwork
- Building trust

The list of high performance teams follows.

- Ecological Risk
- Technical Area (TA)-35 Sampling and Analysis Plan
- Airport Landfill
- TA-54 Resource Conservation and Recovery Act Facility Investigation/Material Disposal Area Implementation Plan
- 260 Outfall Corrective Measures Study/ Corrective Measures Implementation
- Permit Modifications

# Analysis and Assessment Focus Area

## *Data Analysis and Assessment Team*

**Project Description:** The Data Analysis and Assessment Team of the Analysis and Assessment Focus Area is responsible for data management and data quality requirements for all ER Project data, including developing a new integrated technical database.

**Accomplishments Description:** The data stewardship process was designed, and data stewards were hired and deployed to the operational focus areas to assist in task-specific data management and data-set preparation activities to ensure the quality and integrity of the electronic technical data. All ER Project data is now handled through the data stewards.

The team began designing the new integrated ER Project database during FY 2000. Specifically, the Data Analysis and Assessment Team

- completed the design model for the sample, field measurement, and chemistry modules of the database;
- completed a plan for moving data into the location module;
- completed cleanup of selected sets of legacy data so it could be included in the location module;
- began locating, staging, and loading all existing R-hole data into the new ER Project database table structures; and
- developed data reporting tools using Microsoft Access as the front-end application.

The team developed and fully implemented seven data validation standard operating procedures and published two new technical papers: “Technical Guidance on EPA SW-846 Method 5035 Sampling” and “Approach to Gamma Spectroscopy Data Quality Evaluation.”

The team supported the Laboratory’s effort in response to the Cerro Grande fire by

- evaluating data for floodplain potential release sites, and
- collecting and assessing all baseline pre-flood data for affected canyons.

# Analysis and Assessment Focus Area

## *Risk Analysis and Review Team*

**Project Description:** The Risk Analysis and Review Team of the Analysis and Assessment Focus Area develops screening and risk assessment methodologies for human health and ecological risk analyses and conducts the technical peer review program. The team is responsible for developing the Native American Risk Scenario--in cooperation with northern New Mexico Pueblos--by identifying exposure pathways.

**Accomplishments Description:** The team updated the ECORISK database, which summarizes input values for calculating ecological risk screening levels to evaluate ER Project sites, and delivered it to the University of California on September 29, 2000.

Team members continued to finalize the analysis of field data on the effect of ambient distribution patterns of chemicals of potential concern on western bluebird and ash-throated flycatcher nesting patterns.

The Risk Assessment and Review Team and the Communications and Outreach Team worked with members of the local Pueblo environment departments to develop a risk-based decision approach relevant to Native American uses of Laboratory lands and environs.

Team members supported the Laboratory's efforts in response to the Cerro Grande fire by

- drafting a conceptual site model and tables of pathways and parameters of various post-fire scenarios,
- evaluating potential impacts that residuals from combusted materials and Laboratory releases might have on downstream ecological and human systems, and
- working with members of the San Ildefonso Pueblo Environmental Department to sample and evaluate the possible effects of post-fire flooding.

# *Strategic Decision Analysis Team*

**Project Description:** The Strategic Decision Analysis Team of the Analysis and Assessment Focus Area conducts strategic decision analysis, decision logic development for potential release sites, surface and subsurface fate and transport modeling, systems modeling, and strategic planning for long-term environmental stewardship.

**Accomplishments Description:** The subsurface flow and transport model (FEHM) was completed at Technical Area (TA)-54 and in Los Alamos/Pueblo Canyon. The fate and transport models at TA-54 are being converted to the systems model, GoldSim.

The team supported the Laboratory's effort in response to the Cerro Grande fire by

- evaluating many of the modeling tools the team has developed, including
  - •the surface-water model (SPLASH) used to evaluate the post-fire flood potentials in heavily damaged watersheds
  - •the groundwater model used to evaluate the potential impacts of flood pool on subsurface flow
  - •a short three-dimensional model (movie) used to show the effects of surface water ponding at the confluence of DP and Los Alamos Canyons
- developing plans to install two vadose-zone monitoring sites in Los Alamos Canyon to assess the impact of the fire on near-subsurface hydrology and transport.

# Canyons Investigations Focus Area

## *Assessment of Contaminated Sediments in Acid Canyon*

**Project Description:** This project consists of characterizing and assessing potential risk from contaminated sediments in Acid Canyon, within the Pueblo Canyon watershed. Acid Canyon received untreated wastewater from laboratories at former Technical Area (TA)-1 from 1944 until 1951, and treated wastewater from a radioactive liquid waste treatment facility at former TA-45 from 1951 until 1964. This area was transferred to Los Alamos County in 1967 and is open to the public and crossed by well-used trails.

**Chemicals of Potential Concern:** Samples collected from Acid Canyon in November 1999 indicated plutonium-239, 240; cesium-137; and strontium-90, among others. Sample data also indicated various metals and organic compounds at levels above background.

**Accomplishments Description:** During FY 2000, ER Project personnel

- prepared detailed geomorphic maps and conducted field characterization of 700 meters of Acid Canyon extending to the confluence with Pueblo Canyon,
- collected 96 sediment samples for analysis at off-site laboratories;
- held several meetings with personnel from the New Mexico Environment Department, the Environmental Protection Agency, and the Department of Energy to reach agreement on an appropriate dose assessment approach for the South Fork of Acid Canyon, where radionuclide concentrations are highest; and
- prepared an interim report on sediment contamination in the South Fork of Acid Canyon, which concluded that reasonable maximum exposures for a conservative “extended backyard” scenario are below the cleanup level of 15 mrem/yr. recommended by the Environmental Protection Agency and the Department of Energy.

# Canyons Investigations Focus Area

## *Canyons Investigations in Los Alamos and Pueblo Canyons*

**Project Description:** This project consists of characterizing and assessing potential risk from contaminants in sediments, surface water, and alluvial groundwater in Los Alamos and Pueblo Canyons. These canyons have received contaminants from multiple sources since the Laboratory was established in 1943, most notably radioactive liquid wastes originating in Technical Area (TA)-1, TA-21, and TA-45. These contaminants have moved off-site and to the Rio Grande. The land in the canyon floors is owned by Los Alamos County, San Ildefonso Pueblo, or the Department of Energy. Most of the canyon floor areas are open to the public, causing a relatively high potential for exposure to any contaminants in the canyon floors, and a correspondingly high level of stakeholder interest. The focus of the ER Project's ongoing efforts is to fill data gaps concerning contaminants in sediments and water. This will allow more complete human health and ecological risk assessments.

**Chemicals of Potential Concern:** The primary contaminants of concern for potential human-health risk include plutonium-239, 240 in Pueblo Canyon sediments; cesium-137 in Los Alamos Canyon sediments; and strontium-90 in Los Alamos Canyon waters. An extensive suite of other radionuclides, inorganic chemicals, and organic chemicals has also been identified as being present at levels above background in either sediments, surface water, or alluvial groundwater.

**Accomplishments Description:** During FY 2000, ER Project personnel

- conducted extensive characterization of sediments in Acid Canyon, a primary tributary to Pueblo Canyon;
- conducted supplemental sediment investigations in parts of Los Alamos and Pueblo Canyons to fill in data gaps identified in prior investigations;
- began preparing a surface water sampling and analysis plan for Los Alamos and Pueblo Canyons (which was put on hold following the Cerro Grande fire); and
- collected samples of sediment, surface water, and alluvial groundwater following the Cerro Grande fire to document the effects the altered hydrologic conditions in the watershed had on contaminant transport; also studied was the chemical composition of the water and ash (muck) transported from burned areas in the Jemez Mountains onto Laboratory land.

# Canyons Investigations Focus Area

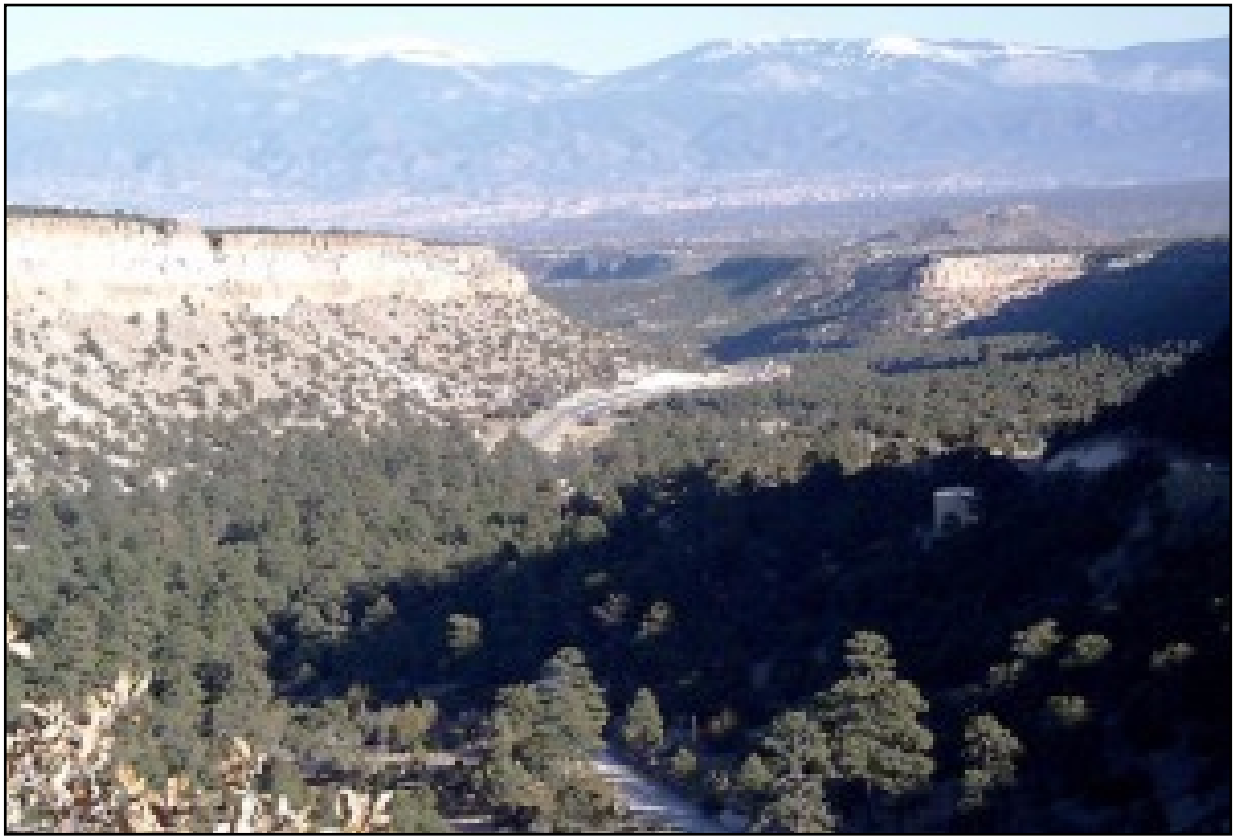
## *Assessment of Potential Sediment Contamination in the White Rock Land Transfer Parcel*

**Project Description:** This project consists of characterizing and assessing potential sediment contamination in Cañada del Buey (CdB) within the proposed White Rock land transfer parcel (reach CdB-4). The proposed land transfer parcel is downstream of potential release sites (PRSs) in Technical Area (TA)-46, TA-51, TA-54, and former TA-4, and could potentially have received contaminants from these sources.

**Chemicals of Potential Concern:** Prior analyses from upstream PRSs indicated that various radionuclides, inorganic chemicals, and organic chemicals may be contaminants of concern, although data were insufficient to determine the presence or absence of individual contaminants in the proposed White Rock land transfer parcel.

**Accomplishments Description:** During FY 2000, ER Project personnel

- completed field investigations and sample collection and analysis for reach CdB-4; and
- prepared a draft report on possible sediment contamination in the proposed White Rock land transfer parcel, which concluded that none of the contaminants analyzed were present above background levels; based on these findings, there is no need for further assessment or remediation prior to transferring the parcel.



# Groundwater Investigations Focus Area

## *Groundwater Investigations Accomplishments*

**Project Description:** In March 1998, the New Mexico Environment Department approved the Laboratory's Hydrogeologic Workplan, which delineates a multi-year drilling and hydrogeologic analysis program designed to characterize the Pajarito Plateau and to assess the potential for groundwater contamination from waste disposal operations. The ER Project's Groundwater Investigations Focus Area works cooperatively with the Laboratory's institutional groundwater efforts (the Water Quality and Hydrology Group) regarding intermediate depth and regional groundwater investigations. Groundwater investigations follow an iterative approach in which information obtained from each borehole is evaluated in the context of the hydrogeological conceptual model. The results may lead to changes in the locations and numbers of future boreholes.

**Accomplishments Description:** FY 2000 highlights for the Groundwater Investigations Focus Area include

- Well R-9: Constructed the well, developed the well and installed the pump. Submitted the well completion report and took samples for two quarters.
- Well R-12: Completed drilling, constructed and developed the well by installing a Westbay sampling system. Submitted the well completion report and completed sampling for one quarter.
- Well R-15: Developed the well and installed a pump. Submitted the well completion report and sampled for one quarter.
- Well R-9i: Completed drilling, constructed and developed the well, and installed the Westbay sampling system. Submitted the well completion report and sampled for one quarter.
- Well R-19: Completed drilling, constructed and developed the well, and installed a Westbay sampling system. Submitted a well completion report and sampled for one quarter.
- Well R-22: Drilled to a total depth of 1,018 feet.
- Well R-7: Plugged and abandoned surface completion post-Cerro Grande fire.

# Information Management Focus Area

## *Information Management Accomplishments*

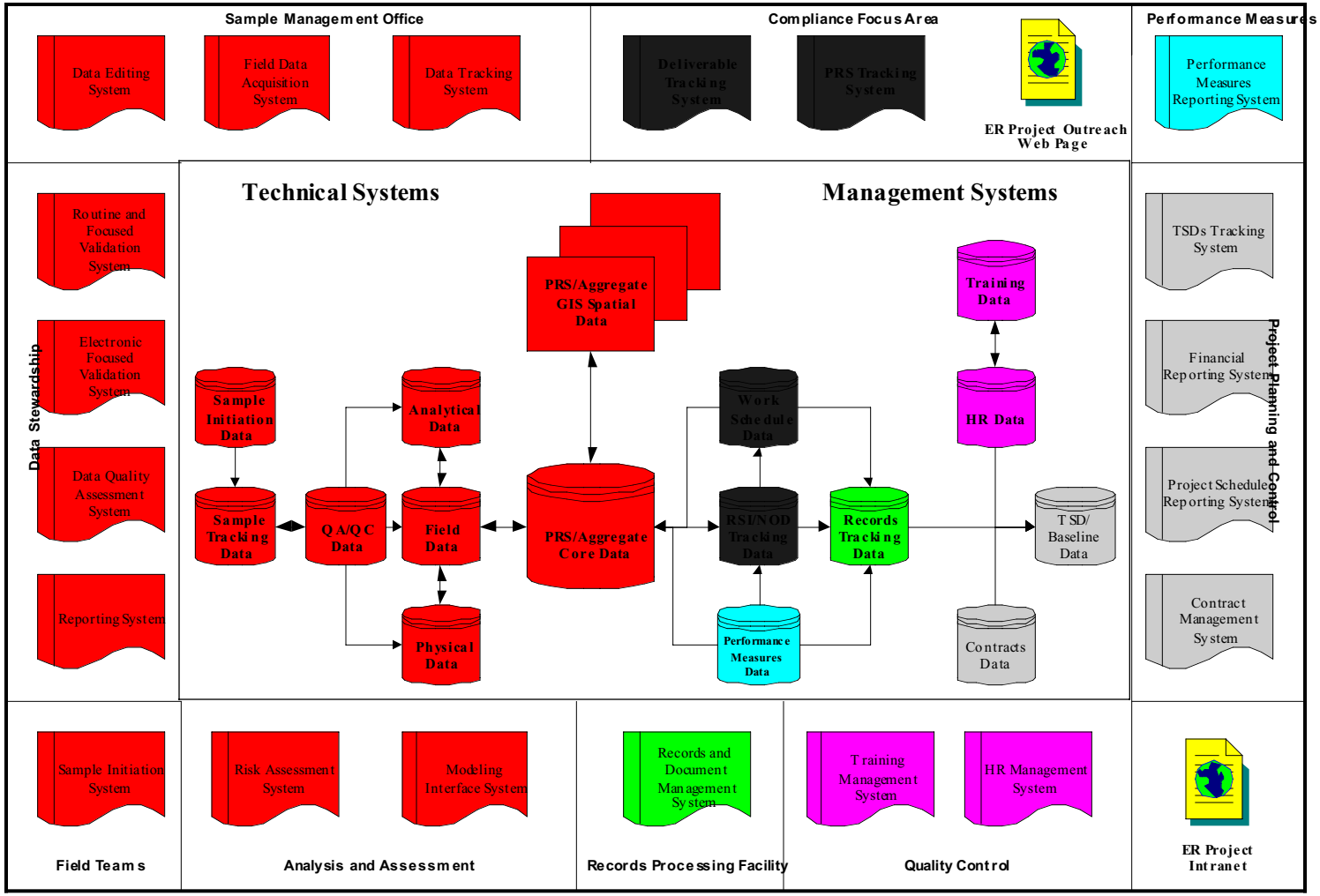
**Project Description:** The Information Management Focus Area was created and added to the ER Project Management Team in FY 2000. The goal of the focus area is to bring all the various project databases, software and hardware functions, and data management activities under the same management. The focus area is developing an integrated system for the capture, storage, and retrieval of the ER Project's scientific, engineering, and business information that accommodates users.

The focus area contains six teams:

- Sample Management Office
- Geographic Information Systems
- Database Administration Support
- Computer Support
- Information Management Development
- Data Management Support

**Accomplishments Description:** The teams of the Information Management Focus Area worked on an extensive re-engineering effort following the completion of an Information Management Plan that was developed in August 1999. A new database, which will hold all types of ER Project data, has been designed and is now being built and tested.

# ER PROJECT INFORMATION SYSTEM MODULES CONCEPTUAL DESIGN



# Material Disposal Area Focus Area

## *Mesa-top Material Disposal Area (MDA) Implementation Plan*

**Project Description:** The Mesa-Top MDA Implementation Plan is a successor to the MDA Core Document. Over the past three years, the MDA Focus Area (in conjunction with the Strategic Decision Analysis Team of the Analysis and Assessment Focus Area) has developed a technical strategy for streamlining the corrective action process for 10 formerly used MDAs that contain large subsurface volumes of poorly characterized radioactive waste. The scope of the Mesa-Top MDA Implementation Plan is comparable to a corrective measures study for a complex site. It involves developing several quantitative decision-making tools, which will result in a set of approved "plug-in" remedies (caps and monitoring systems) for MDAs A, B, C, G, H, L, T, U, V, and AB. The plug-in approach is based on the premise that corrective action sites with similar problems will need similar final remedies.

**Accomplishments Description:** During FY 2000, the MDA Focus Area completed a draft of the Mesa-Top MDA Implementation Plan and initiated an MDA High Performance Team to review the scope and sufficiency of the plan.


N
MDA B
MDA V
MDA T
MDA A
MDA U

# Material Disposal Area Focus Area

## *Technical Area (TA)-49 MDA AB*

**Project Description:** TA-49, also called the Frijoles Mesa Site, is located off State Road 4, adjacent to Bandelier National Monument. The site was historically used for experiments involving high explosives and radioactive materials.

**Chemicals of Potential Concern:** Radionuclides

**Accomplishments Description:** During February and March 2000, the ER Project installed three new shallow neutron access holes and two time-domain-reflectometry arrays in the topsoil and crushed tuff cover at MDA AB and initiated monthly moisture monitoring. The moisture-monitoring equipment is designed to document the performance of the evapotranspiration (ET) cover that was installed in 1999.

# Material Disposal Area Focus Area

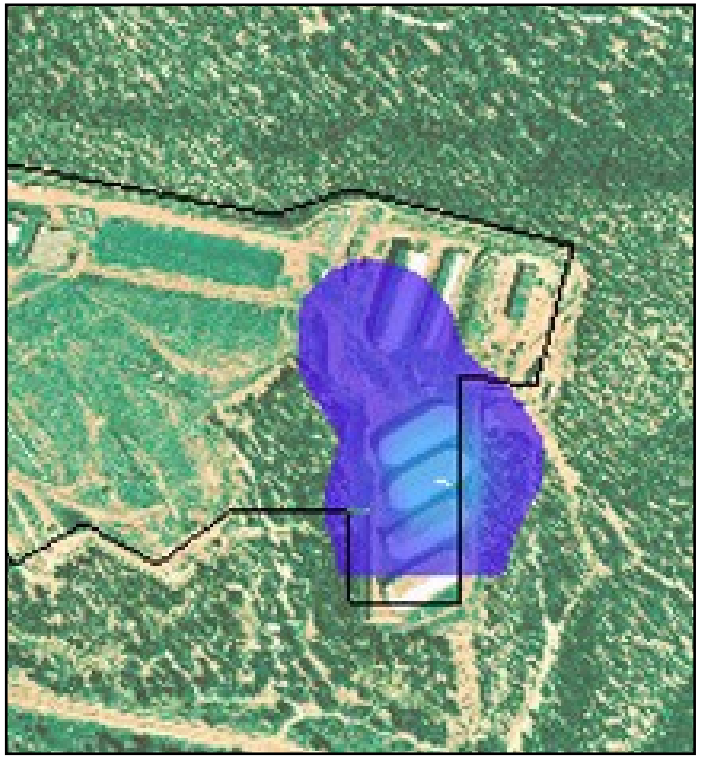
## *Technical Area (TA)-54 Subsurface Vapor-Phase Plume*

**Project Description:** TA-54 is located in the east-central portion of the Laboratory on Mesita del Buey, between Pajarito Canyon to the south and Cañada del Buey to the north. During the 1950s, the Laboratory, with the approval of the US Atomic Energy Commission, and upon recommendation of the US Geological Survey, selected TA-54 as a waste disposal site. Some of the wastes disposed of were volatile organic compounds, which have formed vapor-phase plumes beneath the ground. Vapor-phase plumes at TA-54 occur because liquid chemicals have been disposed of in pits and shafts at MDA L, and sludges and solvent-contaminated rags have been disposed of at MDA G.

The ER Project has mapped and analyzed these vapor plumes to determine their chemical content, concentration, and size, by doing subsurface pore-gas sampling at 33 wells at TA-54. The purpose of the sampling at MDAs L and G is two-fold:

1. to identify changes in contaminant concentrations at the perimeter of the relatively well-characterized plume at MDA L as an indicator of outward plume expansion (i.e., extent), and
2. to monitor for contaminants and changes in contaminant concentration distributions within the plumes at MDAs L and G as an indicator of changes warranting further attention (i.e., nature).

**Accomplishments Description:** During FY 2000, the ER Project completed a diffusion model of the volatile organic vapor-phase plume. The model will be used to design a passive venting system to control and reduce the size of the plumes.



# Material Disposal Area Focus Area

## *RCRA Facility Investigation (RFI) for Technical Area (TA)-54*

**Project Description:** TA-54 is located in the east-central portion of the Laboratory on Mesita del Buey, between Pajarito Canyon to the south and Cañada del Buey to the north. The site is divided into four MDAs:

- MDA G has been used since 1957 for permanent land disposal of radioactive solid waste and is now used for disposal of low-level radioactive waste and the storage of mixed and transuranic wastes.
- MDA H was used between 1960 and 1989 for permanent land disposal of classified or sensitive wastes, some of which were contaminated with radioactive, hazardous, or explosive constituents.
- MDA J was used between 1960 and 1990 for disposal of administratively controlled wastes.
- MDA L was used between 1959 and 1986 for permanent land disposal of chemical waste and is now used for storage of hazardous and mixed liquid wastes.

MDAs G, H, and L have associated potential release sites (PRSs) that are subject to postclosure corrective action under the Resource Conservation and Recovery Act (RCRA); they are evaluated in this RCRA facility investigation (RFI). MDA J is currently being closed under the New Mexico solid waste management regulations; it was not evaluated in the RFI.

The objectives of the RFI include

- determination if releases have occurred from subsurface PRSs,
- characterization of nature and extent of any contaminant releases to the environment,
- evaluation of potential human health and ecological risks posed by known and projected releases and exposures,
- recommendation, as necessary, of additional investigations or studies at TA-54 to reduce uncertainties associated with potential human and ecological impacts, and
- evaluation of the need for near- and/or long-term corrective measures to reduce present-day and/or potential future risk.

**Chemicals of Potential Concern:** The RFI addresses releases of contaminants and risks associated with the wastes disposed of at MDAs G, H, and L before July 24, 1990, when the state of New Mexico was granted RCRA authority by the Environmental Protection Agency (EPA). Chemicals of potential concern include many inorganic chemicals, such as electroplating solutions with residual metals; radionuclides, such as tritium, activation products, fission products, and actinides; and organic chemicals, such as polychlorinated biphenyls (PCBs) and solvents.

**Accomplishments Description:** The present-day human health risk assessment in the draft RFI concluded that current levels of contamination in air, surface soil, and sediment do not exceed applicable risk thresholds established by the EPA. The present-day ecological screening assessment detected concentrations of Aroclor-1260 (a PCB) in surface soils at MDA G below levels that require cleanup to protect human health or ecological receptors.

The primary conclusion of the draft RFI report, based on the interpretation of the results of the risk assessments, is that sufficient information is available to evaluate and optimize corrective measures for controlling potential future risks posed by potential long-term releases at TA-54.

The draft RFI report for TA-54 was completed in FY 2000. A high performance team was established to review the report and identify and correct any report deficiencies.


Access
Gate
MDA H
MDA J
Access
Gate
MDA L
Access
Gate
Pajarito
Road
Pajarito Canyon
Cañada del Buey
LLW Pits
MDA G
1998
1995

# Material Disposal Area Focus Area

## *Non-traditional In Situ Vitrification (NTISV)—Hot Demonstration*

**Project Description:** The purpose of this project was to demonstrate whether in situ (on-site) vitrification (heating to extremely high temperatures) could provide an environmentally sound, safe, and cost-effective solution for treating and stabilizing soils contaminated with chemical and radioactive wastes. The project uses electrical energy to convert contaminated soil into an inert, environmentally benign glass-like block. The demonstration was conducted at Technical Area (TA)-21, MDA V, during April 2000. The "cold" demonstration (involving no radioactive materials) was conducted during April 1999.

**Chemicals of Potential Concern:** MDA V served as a disposal area for a now-closed facility that laundered radionuclide-contaminated garments. The facility had three discharge absorption beds that operated from 1945 to 1961 and disposed of approximately 40 million gal. of waste containing inorganic compounds and radionuclides, including americium, plutonium, uranium, strontium, and tritium.

**Accomplishments Description:** During the hot demonstration, the team vitrified the central section of the northernmost absorption bed, an area approximately 20 ft long by 30 ft wide by 22 ft deep. To vitrify the mass of cobble, gravel, soil, and contaminants, the team inserted four electrodes into the ground. Power was gradually increased to more than 3 million watts, raising the temperature of the material to between 2200 and 2550 ßC. With increasing temperatures, the underground melt area slowly increased in width and depth. As the material melted, virtually all of the organic chemicals would have broken down and been released as gases. The gases were filtered from the air by treatment systems. Only filtered air was discharged into the atmosphere during the demonstration. The inorganic chemicals and radionuclides were contained within the molten glass block that will be left in place. About one year after the demonstration, the vitrified glass should be cool enough for obtaining samples to evaluate whether the project was successful in immobilizing the inorganic chemicals and radionuclides found at MDA V.

# Regulatory Compliance Focus Area

## *Tracking, Contracts, and Training*

**Project Description:** The Tracking, Contracts, and Training Team is responsible for tracking regulatory history and future deliverables information for ER Project potential release sites (PRSs), working to continuously improve the quality of ER Project subcontracting, and developing and implementing a training program for the project.

**Accomplishments Description:** During FY 2000, the team worked in several major areas and accomplished the following:

- PRS and future deliverables tracking
  - Began integrating the PRS database with an erosion database and other project databases;
  - Provided information on PRSs that burned in the Cerro Grande fire;
  - Updated PRS consolidation information;
  - Worked to develop a process for tracking regulatory deliverables in the Baseline;
  - Tracked future deliverables and worked with project personnel regarding possible date changes for deliverables due to the Cerro Grande fire;
  - Notified regulators about schedule changes due to the Cerro Grande fire.
- Closeout for PRSs
  - Conducted quality reviews of closeout files;
  - Developed new closeout files.
- Training
  - Began developing a formal and automatic system to track training requirements and accomplishments for all ER Project staff and subcontractors.
- Contracting
  - Developed a statement of work for the prime ER Project subcontractor competition;
  - Served on the peer review committees for all statements of work and modifications;
  - Helped develop quality procedures concerning contract improvements.

# Regulatory Compliance and Facility Integration

**Project Description:** The Regulatory Compliance and Facility Integration Team is responsible for providing assistance with regulatory compliance interpretation issues and for resolving issues for activities within the ER Project. The team also attempts to coordinate the activities of the ER Project with those of other Laboratory groups.

**Accomplishments Description:** During FY 2000, the team worked in several major areas and accomplished the following:

- Resource Conservation and Recovery Act Compliance
  - Updated several quality procedures;
  - Reviewed documents prepared by the ER Project and participated in peer reviews;
  - Deployed personnel from the Laboratory's Hazardous and Solid Waste Group participated in reviews as subject matter experts;
  - Performed numerous National Environmental Policy Act, Cultural, and Biological Resources screening checklists/reviews.
- Clean Water Act Compliance
  - Published a summary report describing ER Project activities to reduce the migration of contamination from potential release sites as a result of the Cerro Grande fire, including field assessments and erosion control evaluations;
  - Completed annual site compliance evaluations for existing stormwater pollution prevention plans at MDA AB, MDA P, and the 260 outfall, as well as for the umbrella solid waste management units/stormwater pollution prevention plans;
  - Developed and submitted to the NMED the annual best management practices (BMPs) update describing the status of BMPs installed resulting from the Surface Water Assessment Team recommendations.
- Waste Management Activities
  - The ER Project reported a 55% reduction in waste generation (totaling 7900 $m^3$ reduced versus 14,250 $m^3$ generated) for FY 2000, with a significant portion of waste reduction being achieved from recycling and reusing waste materials generated by the cleanup at MDA P (in FY 2000, the DOE implemented a complex-wide goal of reducing waste generated by the ER Project activities by 10%);
  - Successfully negotiated "No Longer Contained In" determinations with the state for wastes containing low concentrations of hazardous wastes at two sites, resulting in a savings of approximately $1.9 million in disposal costs;
  - Successfully demonstrated that 700 $yd^3$ of soil from MDA P contained depleted uranium at concentrations below the authorized limits, thereby allowing the waste to be disposed of as hazardous rather than mixed waste. Resulting in a savings of approximately $750,000 in disposal costs;
  - Successfully negotiated with the EPA concerning the disposal of soils containing less than 50 ppm of PCBs, thereby reducing the disposal cost by approximately $280,000.
- Land Transfer Activities
  - Continued coordinating Land Transfer activities with the Four Accord Tribes, Los Alamos County, and other stakeholders;
  - Completed CERCLA 120(h) reviews of the Manhattan Monument and Site 22 Land Transfer parcels.

# Regulatory Compliance Focus Area

## *Special Projects and Deployed Regulatory Generalists*

**Project Description:** The Special Projects and Deployed Regulatory Generalists Team of the Regulatory Compliance Focus Area is responsible for addressing all compliance issues associated with project planning and field work. The team addresses all regulatory special requests from the administrative authority and interested stakeholders.

**Accomplishments Description:** During FY 2000, the team worked in several major areas and accomplished the following:

- Support to Focus Areas: Personnel from the team are deployed to operational focus areas to provide support regarding regulatory issues.
  - Waste management and storm water inspections at all field activity locations.
  - Data collection supporting the New Mexico Environment Department's underground storage tank risk assessment.
  - Development of a closure plan (Technical Area (TA)-16-394).
- Permit modification/annual unit audit.
  - Assembled and submitted information supporting 30 no further action (NFA) proposals from previous permit modification requests to support the New Mexico Environment Department's Statement of Basis.
  - Prepared and submitted a Class III Permit Modification Request for 9 new NFA proposals to the state.
  - Prepared and submitted a Class I Permit Modification Request to remove 8 new NFA proposals to the state.
  - Initiated review and information gathering to support approximately 40 potential release sites to be included in another Class III Permit Modification Request.
  - Negotiated final consolidation of potential release sites during the state's annual unit audit that is used to determine the Hazardous Waste Unit business fees. The team consolidated another 107 Hazardous and Solid Waste Amendment (HSWA) units and 34 non-HSWA units this FY, thereby reducing the number of potential release sites that are subject to these fees and bypassing the need for submitting an administrative NFA permit modification request.

## Potential Release Site (PRS) Reduction
## 2124 Original PRSs

| | | | |
|---|---|---|---|
| HSWA* PRSs (Administrative Authority NMED) | 1,099 | Non-HSWA PRSs (Administrative Authority DOE) | 1,025 |
| PRSs removed from HSWA Module (FY99) | (102) | DOE-approved NFAs | (566) |
| PRSs pending public comment (FY01) | (30) | New PRS (36-008) | 1 |
| New NFA to NMED FY00 | (17) | | |
| New PRSs (16-017 split) | 10 | | |
| *Subtotal* | 960 | *Subtotal* | 460 |
| HSWA Unit Reduction (annual unit audit) | (419) | Non-HSWA PRSs consolidated with HSWA | (121) |
| *Total Discrete HSWA PRSs* | 541 | *Total Discrete Non-HSWA PRSs* | 339 |

*HSWA = Hazardous and Solid Waste Amendments

**Total of Discrete Units = 870**

# Regulatory Compliance Focus Area

## *Communications and Outreach*

**Project Description:** The purpose of the Communications and Outreach (C&O) Team is to provide a framework for presenting understandable and consistent information to the public about the investigation and cleanups of potential release sites. The community (outreach) and internal Laboratory (inreach) activities of the C&O Team are regulated in part by US Department of Energy (DOE) policies and orders, by provisions in the HSWA Module VIII of the Laboratory's Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit, and by provisions of Appendix F of the contract between the University of California and the DOE.

**Accomplishments Description:** During FY 2000, the team worked in several major areas and accomplished the following:

Outreach activities included the following activities.

- Coordinated one legally required public meeting: the RCRA Permit Modification meeting held on July 19, 2000;
- Supported the Northern New Mexico Citizen's Advisory Board by attending monthly board meetings and monthly Environmental Restoration and Waste Management subcommittee meetings;
- Coordinated the monthly Availability Sessions between DOE and ER Project personnel and the public;
- Coordinated the ER Project Quarterly Meetings;
- Coordinated over 30 tours to ER Project-related sites;
- Participated in meetings with Los Alamos County dealing with solid waste management units (SWMUs), Acid Canyon, and Land Transfer issues;
- Participated in many meetings with the Four Accord Pueblo representatives on SWMUs, the Native American Risk Scenario, and Land Transfer issues;
- Continued maintenance and enhancement of the ER Project's external and internal ER Project websites.

Significant accomplishments for FY 2000 included:

- Early and consistent involvement with public information efforts during and after the Cerro Grande fire;
- Development of a Virtual Library on the external web page allowing the public to access ER Project documents online;
- Continuing commitment to public service by volunteering at various community functions and coordinating fund raising events at the ER Project.

Los Alamos Monitor Friday, December 24, 1999

# Lab employees make Christmas brighter for needy families, children

By DANICA TUTUSH
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Tis the spirit of the season, and members of LANL's Environmental Restoration (ER) Project have been taking that sentiment to heart.

For the second year in a row, the ER group has adopted several needy families in throughout northern New Mexico, said Paul Schumann, leader of the ER Community and Outreach Team.

"We're blessed to have the jobs that we do. It's nice to share those gifts with others," said Schumann.

Like other efforts across the laboratory, it's given them a chance to brightened up someone else's day by playing Santa Claus to someone from the area in need.

Their Santa streak began last year, during a brainstorming meeting, said Carmen M. Rodriguez, a community involvement specialist on the ER team. People had talked about wanting to do something like this, so they did.

"We called it being an angel for someone," said Rodriguez.

The group put out the word that they were willing to help, and got the names of people in the community who they could assist, explained Rodriguez.

Then, the ER's five focus teams kicked into gear, purchasing everything they could for the people whom they were assisting. In 1998, each focus group adopted one family. This year the ER group is helping 11 families throughout Los Alamos, Española, and Santa Fe. The families include 49 people, from a 1 1/2-year-old to the elderly. Family size also varies, from a single mom with two children to a family of 12. The latter request came in at the last minute. When Schumann put the word out about this family's needs, one of its contractors, International Technical Corporation, saved the day.

"They adopted the whole family," explained Schumann.

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CHRISTMAS

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"It's amazing how much need there is out there in the community," said Rodriguez.

Some of the names came to ER group through the LANL Community Outreach office and many others called them directly for help.

"The word got out about what we did last year, and people started calling us," explained Schumann. "It was really surprising and exciting."

ER members received a list of the individuals, their ages, sizes, and requests, and then matched those up with donations of clothing, toys, food, and even monetary assistance. The group then gathered a whole conference room full of items, wrapped them up and boxed them, and delivered the goods to the families at their homes. They also provided a turkey dinner for each family.

The response from the families themselves was overwhelming, said Rodriguez. People were overwhelmed and delighted by the group's generosity, she said.

"They were so thankful," said Rodriguez. "It was really beautiful."

The group members got into it as well, said Schumann. They really took an interest in the individuals they were helping and it gave them a chance to connect to them.

"It's nice to have people who work at the lab be so generous," said Schumann.

Some people from the outside [illegible] ab have misconceptions about it and its workers. They think the scientists are isolated or don't care about the outside world, added Schumann.

Courtesy Photo

**Memebers of Los Alamos National Laboratory's Environmental Restoration team get ready to deliver Christmas presents to needy families in northern New Mexico.**

"It's nice for people to see that we are just people like everyone else, and we want to make a difference," explained Schumann. "It's really heartwarming and it makes you remember the spirit of giving."

Another effort at LANL to help make the holidays brighter for those less fortunate was undertaken by employees at the Los Alamos Neutron Science Center (LANSCE).

Members of the division pitched in to provide presents for 163 children in northern New Mexico, including 35 foster children, said Ginger Grant.

The division obtained the names of the children from the state's Children, Youth and Families Department. Each child, from ages 1 month to 18 years, received toys, clothing and a pair of shoes.

# RCRA Corrective Actions Focus Area

## *RCRA Closure at Technical Area (TA)-16, MDA P*

**Project Description:** MDA P is located at TA-16 on the south rim of Cañon de Valle, on the western edge of the Laboratory. Laboratory personnel began disposing of material contaminated with high explosives at MDA P in the 1950s; operations ceased in 1984. ER Project personnel began the closure process at the landfill in 1997. While digging test pits to identify the kinds and amounts of waste it contained, work crews discovered pieces of high-explosive materials that could have been detonated.

**Chemicals of Potential Concern:** The contaminants of primary concern found at MDA P included high-explosive pieces that could explode, high-explosive residues in soil, barium, and asbestos. MDA P also contained low levels of uranium and metals such as lead and cadmium.

**Accomplishments Description:** Remote excavation of the landfill began in February 1999 and was completed on May 3, 2000, just before the Cerro Grande fire erupted. Excavation of contaminated soil beneath the landfill using non-remote excavation methods resumed after fire recovery was completed in early July. FY 2000 highlights include

- over 44,000 $yd^3$ of soil and debris were excavated (22,900 $yd^3$ during FY 2000);
- over 19,900 $yd^3$of material (hazardous and industrial waste and recycled materials) were shipped for disposal;
- approximately 260 lbs of high-explosives material were removed;
- scrap metal and concrete were shipped to recycling facilities; contaminated soils and industrial wastes were shipped to off-site solid waste landfills; and solid wastes that didn't contain hazardous materials were disposed of on-site at TA-54, MDA J.

# RCRA Corrective Actions Focus Area

## *Voluntary Corrective Action at Potential Release Site (PRS) 00-019*

**Project Description:** PRS 00-019 is located on property currently owned and used by Los Alamos County. It is the site of the county's former Central Waste Water Treatment Plant, which served the townsite and Laboratory's sanitary waste needs from 1947 until 1965. The site is located in the eastern part of the townsite between Sombrillo Nursing Facility and East Park, at the north edge of the mesa above Graduation Canyon, a hanging tributary of Pueblo Canyon. PRS 00-019 included manholes, primary and final settling tanks, a pump house, underground piping, a sludge digestion tank and drying beds, a trickling filter, a clarifier, a chlorinating station, and two outfall areas associated with the waste water treatment plant. An outfall is the end of a drain or pipe that carried the waste water from the treatment plant.

This voluntary corrective action removed many of the subsurface structures associated with the waste water treatment plant and defined the potential for future risk to human health and/or the environment resulting from past operations at the plant. The county plans to lease the property for the development of a senior citizen residence and assisted living center on the mesa-top potion of this property.

**Chemicals of Potential Concern:** The results of sampling at PRS 00-019 in 1996 and 1997 indicated contamination by several metals in the soil beneath the eastern outfall. Five radionuclides were reported at trace levels when the sludge beds were sampled. No inorganic or organic chemicals were detected above background levels. Samples were collected in 1999 and 2000 after the ER Project removed the subsurface piping and outfalls. Analysis indicated that no unacceptable risk remains as a result of past plant operations although some elevated levels of metals do remain on the site, typically at depth or otherwise not readily accessible to humans or the environment.

**Accomplishments Description:** During FY 2000, ER Project personnel

- removed and disposed of approximately 1500 linear ft of abandoned underground process piping and 4 $yd^3$ yards of potentially contaminated soil associated with the outfall areas,
- demolished the pump house and disposed of approximately 300 $yd^3$ of primarily concrete debris and 1 $yd^3$ of asbestos-containing waste, and
- recycled two 55-gal drums of lead and 1 $yd^3$ of brass.


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# RCRA Corrective Actions Focus Area

## *Source Removal at Potential Release Site (PRS) 53-002(b)*

**Project Description:** This project consisted of removing radioactive sludge and the Hypalon™ liner from within the southern lagoon at Technical Area (TA)-53. The southern lagoon at TA-53 is approximately 305 ft long, 148 ft wide, and 6 ft deep. It holds approximately 2.6 million gal. The lagoon was constructed in 1985 and received excess wastewater from the northern lagoons from 1985 to 1992. It also received radioactive liquid waste discharges from 1992 to the end of 1998, the year it was taken out of service.

**Chemicals of Potential Concern:** Samples collected from the lagoon in December 1999 and January 2000 indicated radioactive isotopes of cobalt, lutetium, sodium, hafnium, and tungsten, among others. Sample data also indicated metals and organic compounds in the sludge at levels below that used to classify the waste as hazardous.

**Accomplishments Description**: During FY 2000, ER personnel

- removed and disposed of approximately 165 $yd^3$ of radioactive sludge; the sludge removal was done under stringent radiological work controls. Individual and overall team radiation dose measurements and exposures remained below the set limits during the sludge removal activity;
- removed and disposed of approximately 30 $yd^3$ of the lagoon's liner;
- pumped 5000 gal of rain water from the lagoon that is awaiting disposal;
- drilled 14 boreholes at the bottom of the south lagoon to 15 ft deep and collected samples to determine if contaminants are present below the liner.

# RCRA Corrective Actions Focus Area

## *Voluntary Corrective Action at Potential Release Site (PRS) 03-056(c): Removal of PCB-Contaminated Soil*

**Project Description:** This project is a voluntary corrective action to remove PCB-contaminated soils from PRS 03-056(c), a storage area located northeast of the Johnson Controls Utilities Shop (Technical Area (TA)-3-223). The Laboratory's electrical power line maintenance contractor has used the area for storage of electrical cable, used and unused dielectric oils, PCB-containing transformers, capacitors, and oil-filled drums. The contractor also stored drums containing waste and product solvents at the site from 1967 to 1992.

**Chemicals of Potential Concern:** ER Project personnel completed an expedited cleanup at this site in 1995, removing 1,000 $yd^3$ of soil. Verification sampling indicated PCBs at concentrations greater than the EPA prescribed cleanup level of less than 1 ppm.

Other chemicals present at the site prior to the 1995 expedited cleanup included mercury, copper, zinc, benzo(b)fluoranthene, tetrachloroethene, trichloroethene, methylene chloride, chrysene, fluoranthene, and pyrene.

Verification sampling for the ongoing voluntary corrective action will include PCBs, inorganic chemicals, and volatile organic compounds.

**Accomplishments Description:** During FY 2000, ER personnel

- started setup, sampling, and excavation activities at the site; much of the west slope, mesa top, and drainage channels have been excavated and/or vacuumed down to bedrock;
- excavated approximately 900 $yd^3$ of PCB-contaminated soil and stored the waste on-site in 70 roll-off bins, while waiting for analytical results from off-site laboratories; the waste is being inspected regularly to ensure compliance.

On-site sample analyses from PCB field test kits reveal that the project is proceeding as planned.


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# RCRA Corrective Actions Focus Area

## *Voluntary Corrective Action at Potential Release Site (PRS) 00-003-99, the Los Alamos Area Office (LAAO) Land Transfer Site*

**Project Description:** This voluntary corrective action is part of the work required for transferring the LAAO land transfer parcel from the US Department of Energy to Los Alamos County. PRS 00-003-99 is a consolidation of PRSs 00-003, a former container storage area; PRS 00-012, an underground steam plant process blowoff tank; and PRS 00-030(i), a septic system that served a World War II era mess hall. PRSs 00-003 and 00-012 are part of the Western Steam Plant on the southern boundary of Technical Area-0; they are adjacent to the parking lot at the current LAAO building. PRS 00-030(i) contains the remaining inlet and outlet drain lines from a former septic system and is located east of the Western Steam Plant between Los Alamos Canyon and Trinity Drive. This PRS is included because of its proximity to PRSs 00-003 and 00-012 and because it is located on the LAAO land transfer parcel.

**Chemicals of Potential Concern:** Lead and dibenzofuran are the primary contaminants of concern at PRS 00-003 that cannot be attributed to the overlying asphalt.

Several metals, but no organic chemicals were detected within the tank at PRS 00-012.

Lead and zinc were detected above the soil or sediment background values in samples collected outside the septic tank at PRS 00-030(i). No radionuclides were detected above background at this site. Twenty-eight organic chemicals were detected in the soil and/or sediment in at least one of the samples collected outside of the septic tank.

**Accomplishments Description:** During FY 2000, ER Project personnel

- removed and disposed of approximately 150 linear ft of vitrified clay pipe from PRS 00-030(i),
- removed and recycled an underground process tank from the Western Steam Plant (PRS 00-012),
- collected supplemental nature and extent samples from PRSs 00-012 and 00-030(i),
- collected confirmatory samples from PRSs 00-012 and 00-030(i), and
- collected supplemental confirmatory samples from PRS 00-030(i).


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# RCRA Corrective Actions Focus Area

## *Cleanup of Potential Release Site (PRS)16-021(c)-99*

**Project Description:** Building 16-260 is the Laboratory's conventional high-explosive machining facility. From 1951 to 1996, 13 sumps discharged high-explosive-contaminated wastewater through the 16-260 outfall, the end of the pipe that carried the wastewater from the facility. PRS 16-021(c)-99 includes the sumps and drain lines that lead to the outfall, as well as the outfall itself, a pond, and a drainage channel. During the facility investigation process, ER Project personnel determined that nearby soils; springs, seeps, surface and alluvial waters in Cañon de Valle; and groundwater were contaminated with high explosives and barium. PRS 16-021(c)-99 is the Laboratory's first corrective measures study/corrective measures implementation project.

**Chemicals of Potential Concern:** The primary contaminants of concern are high-explosive compounds, including HMX, RDX, and TNT. Barium is also a contaminant of concern.

**Accomplishments Description:** During FY 2000, ER Project personnel removed the majority of the high-explosive and barium sources at PRS 16-021(c)-99. Approximately 1400 $yd^3$ of soil and rock from within the outfall area were excavated, using both conventional and robotic excavation methods.

# RCRA Corrective Actions Focus Area

## *Cañon de Valle R-15-3 (CdV-R-15-3) Characterization Well*

**Project Description:** CdV-R-15-3 is a deep characterization well located in Technical Area (TA)-15. It is approximately 800 ft east of the northeast rim of Cañon de Valle, on the east side of R-Site Road. It is located approximately 1.5 mi downgradient from the R-25 well.

The well was installed to help determine if the high-explosive contamination that has been detected in the perched and regional aquifers of Well R-25 in TA-16 extends to the east. Secondary objectives include (1) determining how fast both water and contamination, if present, have been moving downgradient toward the Pajarito well field or other potential exposure points, and (2) investigating the directions of groundwater flow and the hydrologic gradients within the regional and perched aquifers in the western portion of the Laboratory.

**Chemicals of Potential Concern:** The primary contaminants of concern include high-explosive compounds, including HMX, RDX, and TNT. Barium is also a contaminant of concern.

**Accomplishments Description:** Well CdV-R-15-3 was drilled to a depth of 1722 ft. A six-screen Westbay sampling system was installed within the borehole. A full suite of open-hole geophysical techniques was used to characterize the geology and hydrology of the borehole. The well penetrated the Tschierge and Otowi members of the Bandelier tuff, the Cerro Toledo interval, a thin basaltic layer, and deep into the Puye formation. Three ephemeral perched water zones were encountered during drilling, and the regional water table was at a depth of 1245 ft. Low levels (measured in less than ppb) of TNT breakdown products were detected in the uppermost perched zone at a depth of approximately 600 ft.


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# Cerro Grande Fire

## *Accelerated Actions and Recovery Efforts*

**Project Description:** On May 4th, 2000 National Park Service personnel at Bandelier National Monument started a prescribed burn of approximately 900 acres on Cerro Grande in the northwest corner of the monument. By the time the fire was 90% contained on Monday, May 22nd, over 47,000 acres and 240 structures in the townsite had burned.

Although the fire entered Laboratory property, no major buildings or nuclear material storage areas burned. Initial assessments indicated that over 600 potential release sites (PRSs) were within the burned area. Most of these sites are on Laboratory property, particularly within Technical Area (TA)-2, TA-15 and TA-16 on the west side of the Laboratory.

In addition to the impact on PRSs within the burned area, the ER Project was concerned that runoff and/or flash flooding could impact other PRSs downstream of burned areas. Runoff could also disturb PRSs on mesa tops and canyon sides and floors where contamination from the early days of Laboratory operations was deposited. Once disturbed, that contamination could potentially flow down the canyons to the Rio Grande.

US Department of Energy and Laboratory officials quickly responded by making fire recovery operations the Laboratory's, including the ER Project's, first priority for the rest of FY 2000. On May 12th, the Laboratory's Emergency Operations Center asked the ER Project to begin an assessment of those PRSs affected by the fire.

**Accomplishments Description:** Projects scheduled for FY 2000 were rescheduled, as investigations about the impact of the fire on potential release sites (PRSs) took precedence. There were three immediate tasks:

1. Evaluate and stabilize sites touched by fire. The PRS Assessment Team completed PRS assessments on May 23rd and completed best management practice (BMP) installations for 91 PRSs on July 19th.

| No. of PRSs | PRS Locations | Start Date | Completion Date | No. of PRSs Completed |
|---|---|---|---|---|
| 10 | Technical Area (TA)-11 | 5/21/00 | 5/24/00 | 10 |
| 29 | TA-6, 9, 14, 15, 22, 36, 40, 49 | 6/14/00 | 7/15/00 | 29 |
| 34 | TA-16, 46, 15 (R-44) | 5/29/00 | 7/15/00 | 34 |
| 18 | TA-4, 5, 42, 48 | 6/27/00 | 7/15/00 | 18 |
| **Total: 91 PRSs** | | | | **Total: 91 PRSs** |

2. Conduct baseline sampling to characterize post-fire, pre-flood conditions (i.e., prior to monsoon season rains) in fire-impacted watersheds. The Contaminant Transport Team developed a Baseline Characterization Sampling Plan on June 24th. Pre-flood fieldwork, including the collection of sediment, surface water, and alluvial groundwater samples, was completed on July 14th. Post-flood fieldwork was carried out in August and September. Post-fire collection of large-scale baseline spatial data sets, including LIDAR and AVARIS flyovers, were completed.

3. Evaluate, stabilize, or remove sites subject to flooding. The Accelerated Actions Team identified 77 PRSs in fire-impacted canyons that were potentially vulnerable to post-fire flooding. The majority of these sites were in Los Alamos (TA-2 and TA-41) and Pajarito Canyon (TA-18 and TA-27) and included outfalls, storm drains, septic systems, and structures associated with the Omega West Reactor at TA-2. The team developed a task plan for evaluating each site to determine the type, if any, of accelerated action required. Evaluation criteria included contaminant concentration and inventory, adequacy of existing data, erosion and scouring potential, and residual risk estimates for canyon systems. Status sheets were developed and continually updated for each PRS.

# Cerro Grande Fire

## *Accelerated Actions and Recovery Efforts (continued)*

Accelerated actions at floodplain sites that are complete include the following.

- TA-2: excavation and waste removal of three subsurface effluent storage tanks
- TA-2: excavation and waste removal of subsurface reactor facility acid pit
- TA-2: excavation and waste removal of soil contaminated with Cs-137 at Potential Release Site (PRS) 02-009(a)
- TA-2: removal of contents and structure of Building TA-2-44, which housed ion exchange columns
- TA-2: waste removal of metal nugget pile, PRS C-02-001
- TA-2: collection of additional site characterization data to determine nature and extent of contamination
- TA-2 and TA-41: walkover radiological surveys to identify areas of elevated beta/gamma radioactivity
- Los Alamos Canyon: removal of sediment contaminated with Cs-137
- Mortandad Canyon Sediment Traps: maintenance and waste removal

In addition to the 77 floodplain sites, 5 fire-impacted sites were identified that required corrective actions to remove debris or contaminated soils. Accelerated actions at fire-impacted sites that are complete include the following.

- MDA-R (PRS 16-019): excavation, waste staging, and waste removal
- R-44 firing site surface disposal area (PRS 15-008(b)): debris removal
- TA-36 surface disposal area (newly identified PRS): debris removal
- TA-40 surface disposal area (PRS 40-010): debris removal
- TA-16 “silver” outfall (PRS 16-020): removal of contaminated soil, stabilization of drainage channel

# Cerro Grande Fire

## *Accelerated Actions and Recovery Efforts (continued)*


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