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Major Accomplishments of the Environmental Restoration Project in Fiscal Year 2001

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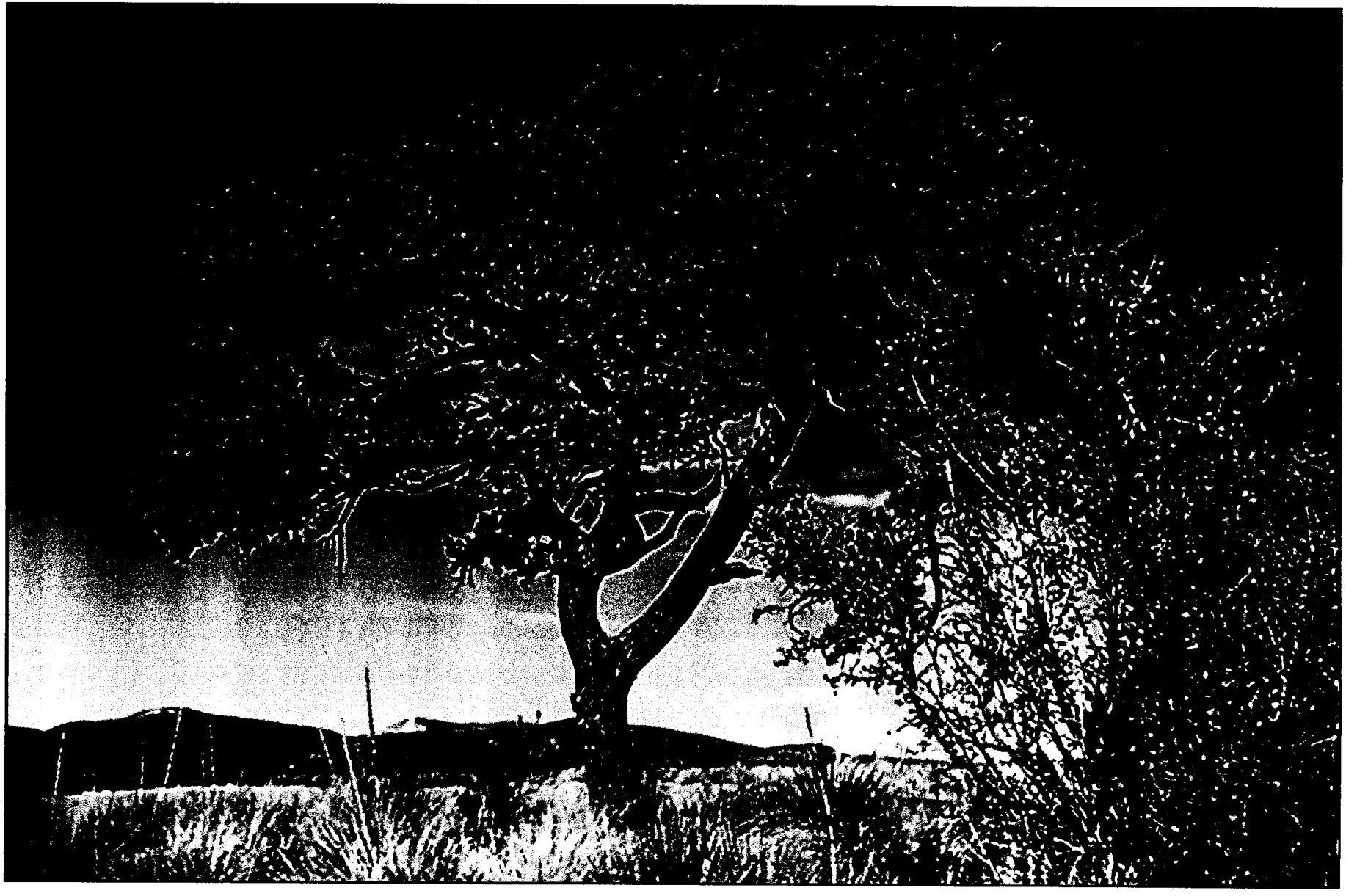
Introduction

The Environmental Restoration (ER) Project marked fiscal year 2001 with a host of significant accomplishments. This accomplishment 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.

If you have any questions or comments about a specific accomplishment or focus area, please contact the Communication and Outreach Team, at 505-665-6770 or by e-mail at carmenr@lanl.gov.



Project Management

Baseline Activities Accomplishments

- Schedule Variance Performance Measure—received an "Outstanding Rating" from the Department of Energy (DOE)
- Cost Variance Performance Measure—received an "Outstanding Rating" from the DOE
- Project management cost as a percentage of total project cost Performance Measure—received an "Excellent Rating" from the DOE
- Committed to 4 new no-further-action recommendations for fiscal year (FY) 2001—accomplished 5
- Committed to drilling of 2 deep wells—accomplished 4
- Reduction of the FY 01 life cycle budget by $116,014,750 as a result of the Performance Improvement Plan and the Baseline Change Proposal process

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 35 Sampling and Analysis Plan
- Airport Landfill
- Material Disposal Areas
- 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 Environmental Restoration (ER) Project data, including developing a new integrated technical database.

Accomplishments Description: In fiscal year (FY) 2000, the ER Project Information Management Team began an extensive multi-year re-engineering of the entire ER Project data management system. The Data Analysis and Assessment Team and the Information Management Focus Area are successfully directing an extensive team, including external database designers, to coordinate the development of complex, state-of-the-art data modules and software applications.

Specifically, in FY 2001, the Data Analysis and Assessment Team completed the following activities:

- designed data requirements for development of a new Sample Management Office software application that generates field paperwork and analytical laboratory orders;
- designed and developed a software application to retrieve data from the standard query language (SQL) ER database (ERDB) for data-set preparation and reporting;
- streamlined the process of getting data validated, loaded into the ERDB, and smoothly extracted from the database;
- facilitated cost savings by reducing the amount of manpower required to validate data by automating and expanding the basic validation process;
- ensured complete and accurate field data and analytical results information for 75% of sampling data records within ERDB;
- migrated 75% of analytical data from ORACLE platform into new SQL ERDB;
- completed data-sharing agreement with the Laboratory Water Quality and Hydrology Group (ESH-18); and
- designed a process to capture all well construction information in the field during well-drilling events and populated new ERDB tables with field information for existing R-well data.

The data stewardship group of the Data Analysis and Assessment Team were instrumental in facilitating the massive requests for data in all its forms following the Cerro Grande fire. Specifically, in FY 2001, the Data Stewardship Team completed data quality and data integrity checks and prepared data sets for 109 potential release sites for the New Mexico Environment Department (NMED). Massive data tables (500,000 data records in approximately 500 data files) were sent to NMED under tight deadlines.

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—in cooperation with Northern New Mexico Pueblos—exposure pathways relevant to traditional pueblo uses.

Accomplishments Description: The Environmental Restoration (ER) Project established a relationship with San Ildefonso Pueblo that included providing risk assessment training and working together to collect samples. The risk assessment training consisted of one half-day seminar on the general risk assessment approach and Native American risk assessment. Future training seminars have been planned. The sample collection activities involved pueblo members and Laboratory Ecology Group (ESH-20) personnel collecting samples from within the Technical Area -74 land transfer parcel. Media sampled included plant material and soil from either culturally important biota or areas. This was the first time the ER Project has teamed with the pueblo to collect data and is the first step in a continuing effort to assist the pueblo in gathering information on traditional cultural resources.

The Risk Assessment Team completed documentation of the derivation and use of radionuclide screening action levels, which are routinely used in the screening assessment process of individual and consolidated potential release sites.

Through work with the Laboratory's Ecorisk Subcommittee, which is tiered to the Integrated Resource Management Plan, the document entitled, "Los Alamos National Laboratory Ecological Risk Management Approach for Contaminants" was completed.

Analysis and Assessment Focus Area (continued)

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 complex sites, surface and subsurface fate and transport modeling, systems modeling, and strategic planning for long-term environmental stewardship.

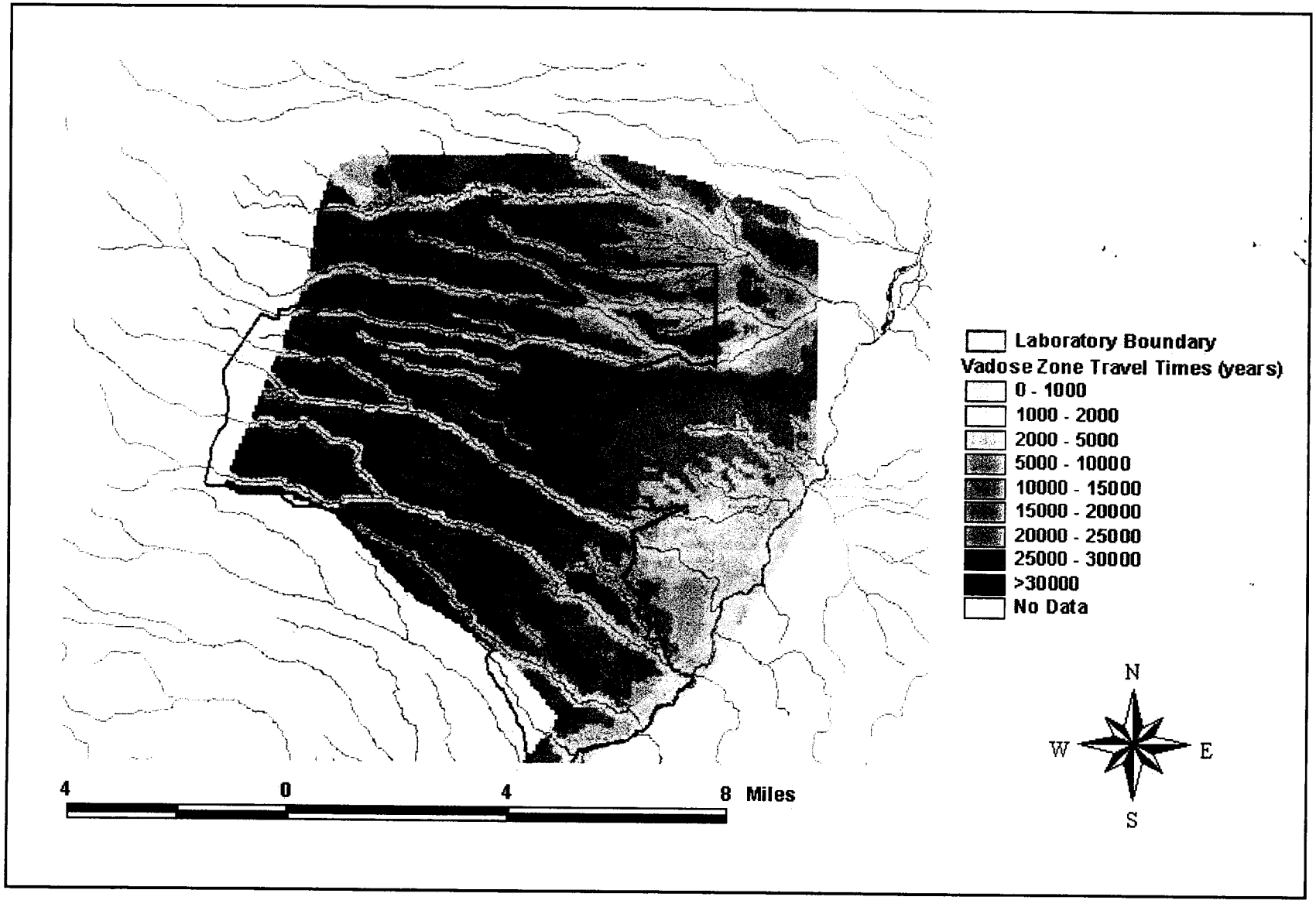
Accomplishments Description: In fiscal year (FY) 2001, three significant tasks were accomplished that demonstrate how decisions and data can and should be linked in the context of risk-based decision-making. Two FY 2001 tasks addressed data needs for regional aquifer characterization as needed to conduct groundwater pathway assessments in the corrective action process. A third task demonstrated how simulation models can be used to inform decisions about the need for and desired features of remedies for large-inventory material disposal areas (MDAs).

First, the phase one of a "first-order groundwater pathway assessment" was completed. This assessment uses groundwater flow simulation models to identify regions of the Laboratory that have fast (less than 100 years), moderate (between 100 and 1000 years) and slow (greater than 1000 years) groundwater flow paths between the surface and the nearest regional-aquifer supply well, based on an assimilation of all available hydrogeologic information.

Second, an airborne survey to remotely map certain hydrologically significant subsurface features of the Pajarito Plateau was nearly completed. A powerful airplane bearing coils of electric-current-carrying wires flew at low altitudes across the Plateau, recording the electromagnetic "reflection" induced in subsurface strata to depths of nearly 1000 feet. Unfortunately, but understandably, the aircraft was grounded on September 11 after completing only about 75% of the fly-lines needed for coverage of the entire Laboratory. Nonetheless, it is anticipated that, once analyzed, the data from this survey will supplement data obtained from boreholes and outcrop to identify the surface of the regional supply aquifer, to quantify the extent of perched water bodies beneath wet canyons, to verify the absence of perched water beneath dry mesas, and to clarify the "subsurface surface" of the basalts.

Third, a quantitative all-pathways baseline risk assessment was completed for MDA H as the technical basis of the corrective measures study (CMS) for that site. Although the Resource Conservation and Recovery Act (RCRA) facility investigation for the site demonstrates that it poses no risk to workers or the public, the NMED requested a CMS to ensure long-term protection from long-lived radionuclides (primarily uranium) in the inventory. Using mathematical models to "animate" the conceptual model of the site, the time-dependent processes and events that may affect "future nature and extent" of contamination at the site were estimated. Results showed that, under present conditions, the site is expected to remain "risk free" through the 1000-year assessment period. It is hoped that the same analytical approach will be used for the larger-inventory MDAs, and to guide long-term environmental stewardship planning.

Vadose Zone Travel Times: Full Scale



Canyons Investigations Focus Area

Cleanup of Contaminated Sediments in the South Fork of Acid Canyon

Project Description: This project consists of planning and implementing a cleanup operation involving contaminated sediments in the South Fork of Acid Canyon, within the Pueblo Canyon watershed. The South Fork of 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. A dose assessment completed in fiscal year (FY) 00 indicated that no unacceptable levels of radionuclide contamination were present in the canyon. DOE directed the ER Project to prepare an "as low as reasonably achievable" (ALARA) analysis, which led to a decision to plan and implement sediment removal activities.

Chemicals of Potential Concern: Samples collected from the South Fork of Acid Canyon 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 2001, Environmental Restoration Project personnel

- prepared an ALARA analysis for the South Fork of Acid Canyon, which evaluated the costs and benefits of different cleanup options;
- prepared an Interim Action Plan for the removal of contaminated sediment to reduce potential radiation doses to recreational users of the canyon;
- collected 48 sediment samples for analysis at off-site laboratories to help guide cleanup operations and improve waste characterization; and
- began sediment removal operations utilizing vacuum technology and excavated approximately 200 cubic yards of sediment by the end of FY 01.

Environmental Restoration Project
Please do not disturb the area behind this sign. It is currently being studied by the ER Project. We are coordinating this effort with Los Alamos County, the New Mexico Environment Department, the U.S. Environmental Protection Agency, and the Public.
ER
Los Alamos

Canyons Investigations Focus Area (continued)

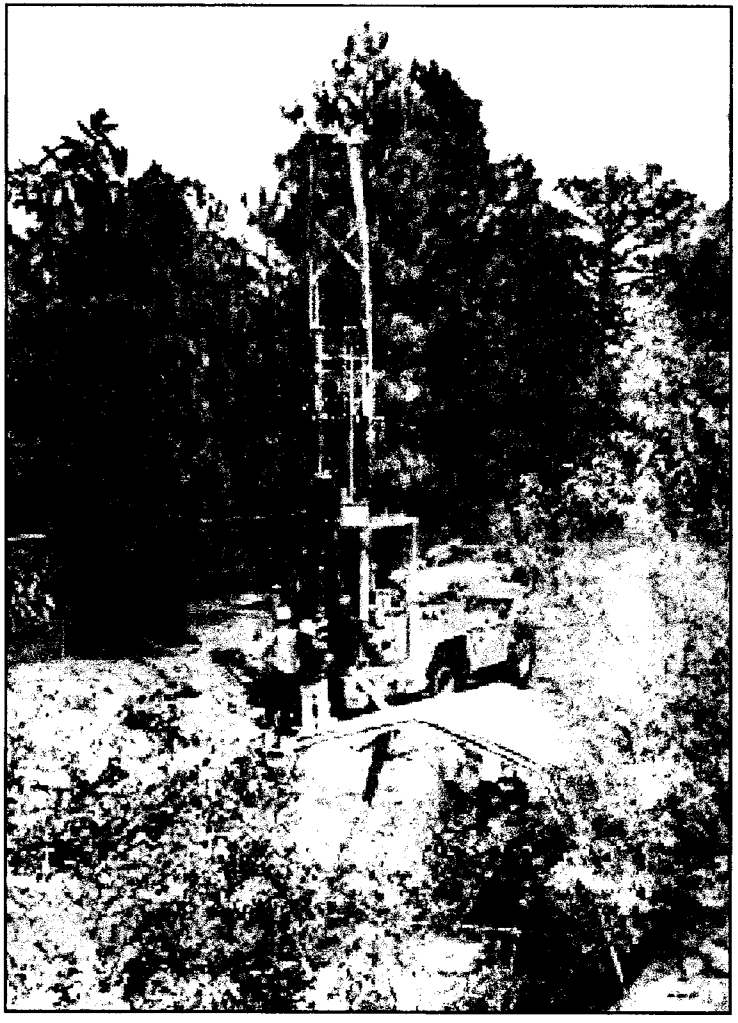
Canyons Investigations in Los Alamos and Pueblo Canyons

Project Description: This project consists of characterizing and assessing potential risk from contaminants in sediments, surface water, and alluvial groundwater in Los Alamos Canyon and Pueblo Canyon. These canyons have received contaminants from multiple sources since establishment of the Laboratory in 1943, most notably radioactive effluent from outfalls in Technical Area (TA) -1, TA-21, and TA-45. There is documented transport of contaminants off-site and to the Rio Grande, most likely since the earliest years of the Laboratory. Either Los Alamos County or San Ildefonso Pueblo owns much of the bottoms of these canyons, and the remaining areas on DOE land are largely open to the public. There is therefore relatively high potential for exposure to any contaminants in the canyon bottoms, and a correspondingly high level of stakeholder interest. The focus of ongoing efforts is to fill data gaps concerning contaminants in sediments and water to allow more complete human health and ecological risk assessments, which will be presented in a Surface Aggregate Report for the Los Alamos and Pueblo watersheds.

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 water. An extensive suite of other radionuclides, inorganic chemicals, and organic chemicals have also been identified as being present at levels above background in either sediments, surface water, or alluvial groundwater.

Accomplishments Description: During fiscal year (FY) 2001, Environmental Restoration Project personnel

- conducted supplemental 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;
- prepared a surface water sampling and analysis plan for Los Alamos and Pueblo canyons (which had been put on hold following the Cerro Grande fire);
- conducted two quarters of sampling of surface water and alluvial groundwater at a series of stations in the Los Alamos and Pueblo Canyon watersheds;
- installed 6 piezometers in Los Alamos Canyon and installed them with transducers to quantify gradients in the alluvial groundwater. These data also support and help refine the water balance study conducted for Los Alamos Canyon;
- completed an updated alluvial groundwater completion report for all shallow well installations in Los Alamos, Pueblo, Mortandad, and Water Canyons; and
- collected samples of sediment, surface water, and alluvial groundwater following the Cerro Grande Fire to document the effects of altered hydrologic conditions in the watershed on contaminant transport, including the geochemical nature of water and ash (muck) transported from burned areas in the Jemez Mountains onto Laboratory land.



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 within the proposed White Rock land transfer parcel (reach CDB-4). The proposed land transfer parcel is downstream of 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 potential release sites (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 contaminants in the proposed White Rock land transfer parcel.

Accomplishments Description: During fiscal year 2001, ER Project personnel

- completed a report on possible sediment contamination in the proposed White Rock land transfer parcel, which concluded that no analytes were present above background levels and that therefore there was no need for further assessment or remediation prior to land transfer.

North Canyons Work Plans

Project Description: This project consists of preparing a work plan for the characterization and assessment of potentially contaminated sediments and surface water in Bayo, Barrancas, Guaje, and Rendija canyons (the north canyons). The north canyons contain potential contamination from a series of former Laboratory sites, most notably Technical Area (TA) -10 in Bayo Canyon. These canyons include extensive areas of public land and San Ildefonso Pueblo land, and also include Laboratory land that is proposed for transfer to San Ildefonso Pueblo or Los Alamos County.

Chemicals of Potential Concern: Prior analyses from PRSs indicated that contaminants of potential concern include strontium-90 in Bayo Canyon, and perhaps high explosives and some inorganic chemicals in several canyons. Available data indicate that levels of contamination may be very low in all of these canyons.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel

- completed a work plan for the characterization and assessment of potentially contaminated sediments and surface water in the north canyons, and submitted this plan to NMED.

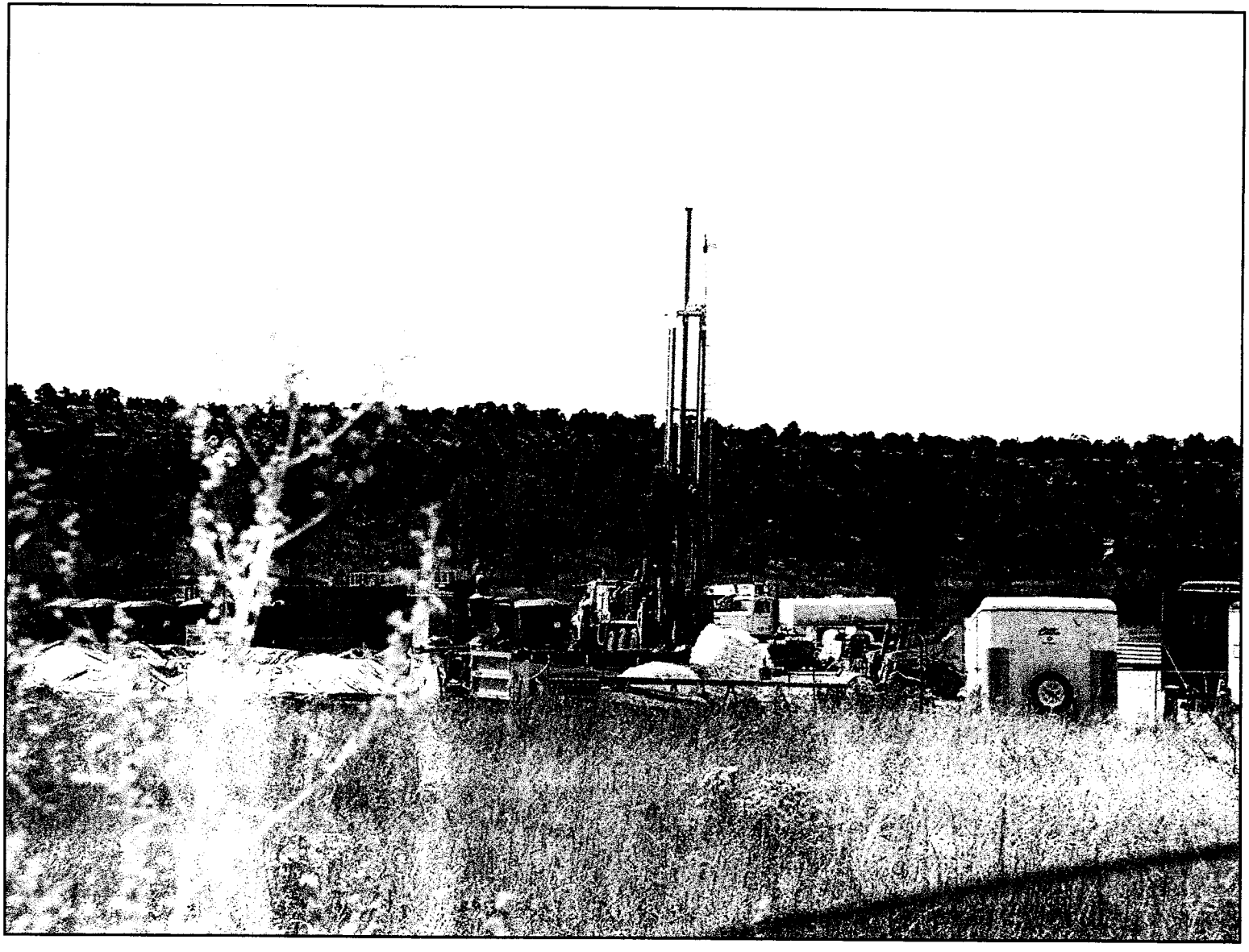
Canyons Investigations in the Mortandad Watershed

Project Description: This project consists of characterizing and assessing potential risk from contaminants in sediments, surface water, and alluvial groundwater in Mortandad Canyon and tributary canyons (Effluent Canyon, Ten Site Canyon). These canyons have received contaminants from multiple sources since establishment of the Laboratory in 1943, most notably radioactive effluent from outfalls in Technical Area (TA) -35 and TA-50. Effluent Canyon continues to receive treated effluent from the radioactive liquid waste treatment facility at TA-50. There is a relatively high inventory of radionuclide contaminants in Mortandad Canyon upstream of San Ildefonso Pueblo lands, and there is a correspondingly high level of stakeholder interest. The focus of ongoing efforts is to provide a thorough watershed-scale characterization of contaminants that will allow defensible human health and ecological risk assessments, which will be presented in a Surface Aggregate Report for the Mortandad watershed.

Chemicals of Potential Concern: The primary contaminant of concern for potential human-health risk in sediment in the Mortandad Canyon watershed is cesium-137. An extensive suite of other radionuclides, inorganic chemicals, and organic chemicals have also been identified as being present at levels above background in either sediments, surface water, or alluvial groundwater.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel

- conducted Phase I characterization of sediments in three reaches in Mortandad and Ten Site Canyons, including initial geomorphic mapping, field radiological screening, and the collection of 66 sediment samples for analysis at off-site laboratories; and
- conducted Phase II characterization of sediments in four reaches in Mortandad and Effluent Canyons, including revision of geomorphic mapping, field radiological screening, and the collection of 220 sediment samples for analysis at off-site laboratories.



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 groundwater hydrogeology of the Pajarito Plateau. The Environmental Restoration Project's Groundwater Investigations Focus Area works cooperatively with the Laboratory's institutional Groundwater Integration Team and functions as the groundwater monitoring well installation group for intermediate-depth and regional aquifer investigations. For each well location, data quality objectives are established, the borehole is drilled and geophysics performed, the well is installed and hydraulically tested, a well completion report is generated, the well is sampled for four quarters, and a geochemistry report is produced. 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: Fiscal year (FY) 2001 highlights for the Groundwater Investigation Focus Area include the following activities:

- Completed the drilling and installation of five monitoring wells, including R-5, R-7, R-22, MCOBT-4.4, and CdV-R-37-2. Another intermediate depth borehole, MCOBT-8.5, was drilled to its total depth and subsequently plugged and abandoned because of its inability to produce water at this location.
- Initiated the drilling of two additional wells: R-8 and R-13.
- Completed the construction and implementation of the DP-funded well drilling baseline.
- Continued with the major effort of quarterly sampling of these wells. Wells with four quarters of sampling completed in FY 2001 include R-9, R-9i, R-12, R-15, and R-19.

Information Management Focus Area

Information Management Accomplishments

Project Description: The Information Management Focus Area's goal 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 Environmental Restoration (ER) Project's scientific, engineering, and business information that accommodates users.
The focus area contains five teams: Sample Management Office (SMO); Geographic Information Systems; Computer Support; Information Management Development; and Data Management Support.

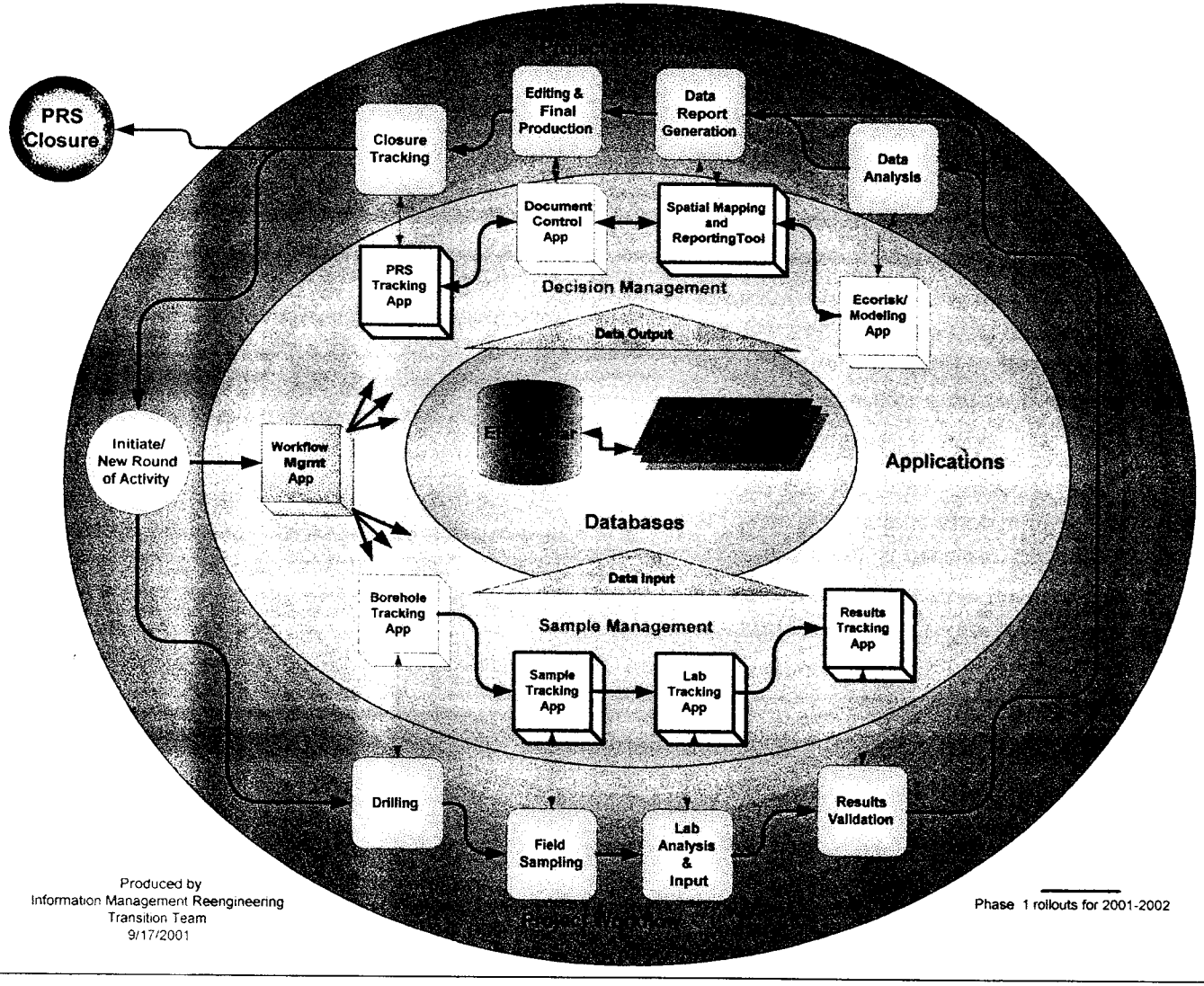
Accomplishments Description: The Information Management Focus Area, in cooperation with the Data Analysis and Assessment Team, and other ER personnel, are successfully directing an Information Management Team, including external database designers, to direct and coordinate the integration of the various project databases and software and hardware functions. In fiscal year (FY) 2001, the Information Management Team focused on the application that tracks data from field collection groups, to analytical laboratories, and eventually to the ER Project database. Specifically, the Information Management Team

- "froze" the design of the new database so it could be populated with real data;
- developed, tested, and placed a new potential release site (PRS) application on-line;
- designed and created two SMO applications currently undergoing review and testing; and
- formed a Transition Team to facilitate communication between ER Project focus areas and the Information Management Team.

In other work in FY 2001, Information Management Focus Area personnel

- facilitated and signed, in concert with the ER Project management, a data-sharing agreement with the Laboratory's Water Quality and Hydrology Group (ESH-18) to allow data transfers between the two organizations;
- decreased the SMO recharge rate for the third year in row;
- handled more than 18,000 containers at the SMO (up from 10,121 containers handled in FY 2000);
- secured a new prime analytical contract with four analytical laboratories to handle the majority of ER sample analyses;
- developed and introduced a new electronic data deliverable (EDD) to the laboratories;
- contributed data and maps for emergency data requests from the New Mexico Environment Department;
- purchased several new servers, and upgraded/replaced wiring to support the computer infrastructure;
- handled more than 950 computer service requests, up from 850 in FY 2000;
- produced 11,000 new maps and more than 33,000 map copies at the Cartographic Laboratory since their origination in 1992;
- drew, edited, and entered consolidated PRS boundaries into the spatial database; and
- created a new spatial-data dictionary that will allow users at the Pueblo Complex to better connect and retrieve data from the Facility for Information Management, Analysis, and Display.

ER Project
Information Management Reengineering
Conceptual Design



Produced by
Information Management Reengineering
Transition Team
9/17/2001

Phase 1 rollouts for 2001-2002

Material Disposal Area Focus Area

RCRA Facility Investigation/Corrective Measures Study for MDA H at TA-54

Project Description: Technical Area (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 material disposal areas (MDAs): MDA G, MDA H, MDA J, and MDA L.

MDA H is a 70-ft by 200-ft (0.3 acre) fenced area that consists of nine inactive vertical disposal shafts arranged in a line approximately 15 ft inside its southern fence. Each shaft is cylindrical, with a diameter of 6 ft and a depth of 60 ft. The shafts are filled with solid-form waste to a depth of 6 ft below the ground surface.

From May 1960 until August 1986, MDA H functioned as the Laboratory's primary disposal area for classified solid-form waste. Between periods of waste disposal, each shaft was covered with a steel plate that was padlocked as a security precaution to prevent unauthorized access to classified materials. Much of the classified waste was nonhazardous; however, various hazardous chemicals, radionuclide-contaminated materials, and materials contaminated by high explosives were also disposed of at MDA H. These include scraps and shapes contaminated with depleted uranium, drummed radioactive waste, fuel elements, a classified unit contaminated with tritium, plutonium-contaminated shapes, and decontamination and decommissioning scrap.

MDA H and its associated solid waste management units are subject to postclosure corrective action under the Resource Conservation and Recovery Act (RCRA) and were evaluated in a RCRA facility investigation (RFI) and corrective measures study (CMS).

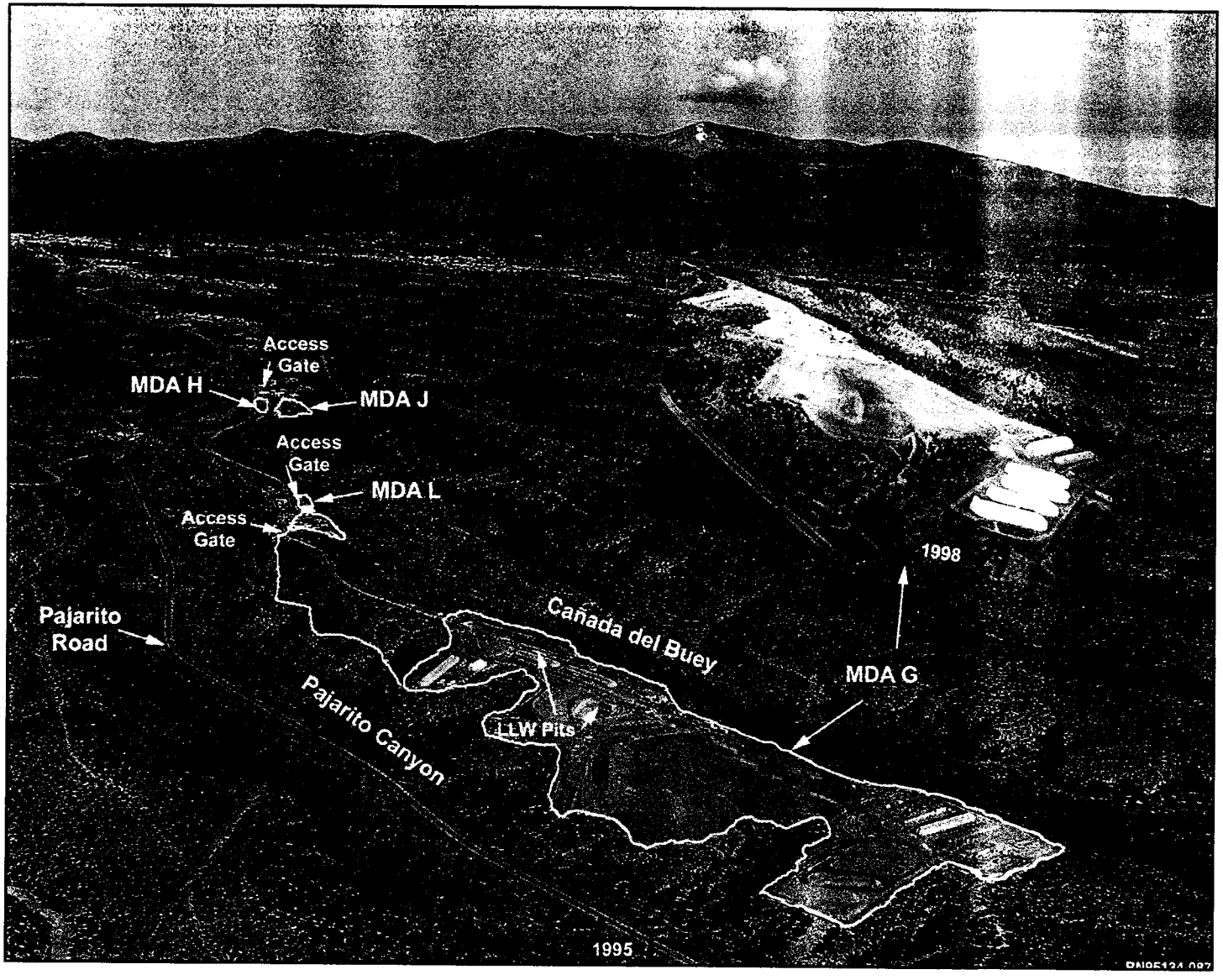
The objectives of the RFI include

- determining if releases have occurred from subsurface units;
- characterizing the nature and extent of any contaminant releases to the environment;
- evaluating the potential human health and ecological risks posed by known releases and exposures; and
- recommending, if necessary, additional investigations or studies at MDA H to reduce uncertainties associated with potential human and ecological impacts.

The purposes of the CMS include

- evaluating alternative corrective measures as a means to correct any feature(s), event(s) or process(es) that may, in time, degrade the site's ability to control contaminant releases, exposures, and associated negative human-health or environmental impacts, and
- recommending a preferred corrective measure that is optimized in terms of the corrective action objectives and evaluation criteria specified in Module VII of the Laboratory's Hazardous Waste Facility Permit.

Accomplishments Description: The RFI report was submitted to the New Mexico Environment Department (NMED) in April 2001. Upon review of the RFI, NMED requested a CMS plan and report be completed to evaluate risk from potential future releases from the subsurface units. A CMS plan was submitted to NMED in March 2001. A draft CMS report was completed in September 2001. The CMS report will be peer-reviewed in the first quarter of fiscal year (FY) 2002 and submitted to NMED in the second quarter of FY 2002.


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

RCRA Facility Investigation for DP Tank Farm

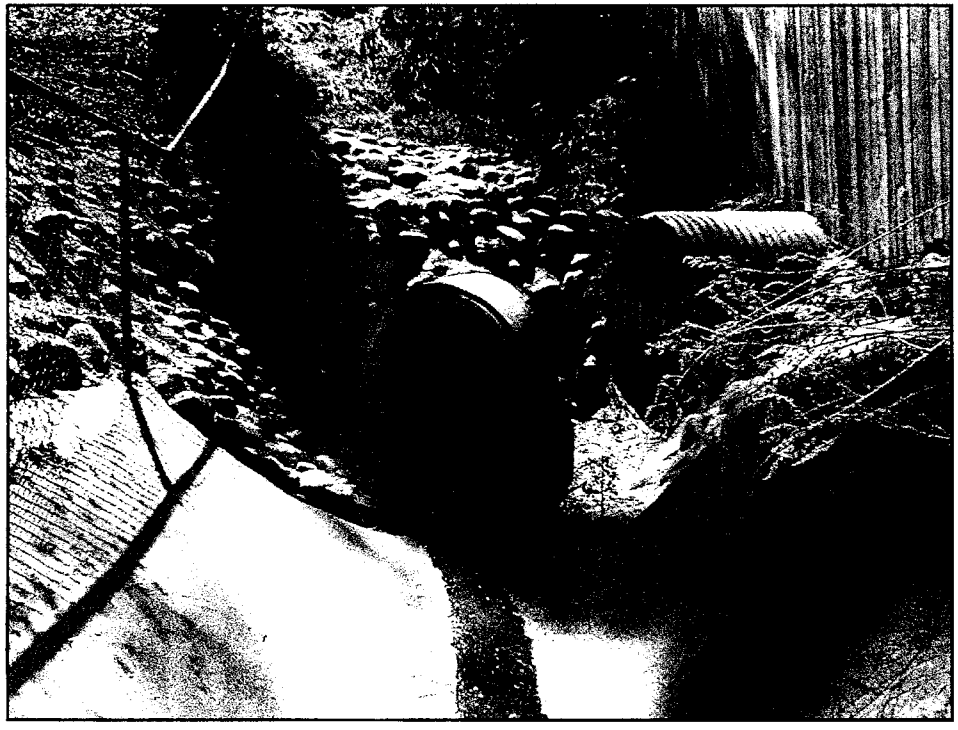
Project Description: DP Tank Farm, Solid Waste Management Unit (SWMU) 21-029, is a 3.5 acre site located at the western edge of Technical Area (TA)-21. DP Tank Farm is the former location of 2 fill stations and 15 tanks that contained petroleum hydrocarbon products. The site was operational from January 1946 to February 1985 and was the primary fueling station supporting Laboratory operations. Structures at DP Tank Farm site included fuel tanks, fill ports, valve boxes, the East and West Fill Stations, and site access roads, all bounded by an earthen berm on the north side of the site along the rim of DP Canyon. The site was decommissioned in 1988, resulting in removal of all major structures at the site.

DP Tank Farm is currently inactive and owned by the US Department of Energy (DOE). The site is a part of TA-21, which is subject to Public Law 105-109; the public law directs DOE to transfer lands that are not critical to the mission of the Laboratory to either Los Alamos County or the Department of the Interior in trust for San Ildefonso Pueblo by November 26, 2007. DP Mesa is slated for transfer to Los Alamos County. The county has advised DOE that the intended use for this property is commercial.

SWMU 21-029 is subject to postclosure corrective action under the Resource Conservation and Recovery Act (RCRA) and was evaluated in a RCRA facility investigation (RFI). The objectives of the RFI include

- identifying the nature and extent of subsurface petroleum hydrocarbon contamination associated with the site;
- identifying the source or sources of petroleum hydrocarbons associated with the two localized hydrocarbon seep areas in DP Canyon;
- identifying the migration pathway or pathways by which petroleum-related products have moved from the source(s) to the areas of the two hydrocarbon seeps in DP Canyon, and determining if these pathways are still active;
- performing screening assessments of New Mexico Environment Department (NMED) underground storage tank (UST)-related chemicals for potential present-day risks posed to human and ecological receptors located on the mesa top; and
- determining if there is a need for remedial action based on risk evaluation.

Accomplishments Description: The RFI report was submitted to NMED on September 28, 2001. As a result of the screening assessments in the RFI, SWMU 21-029 was recommended for no further action because concentrations of UST-related chemicals are less than NMED risk levels and SALs. Upon review of the RFI report, NMED issued a request for supplemental information to clarify language in the report. NMED has verbally indicated that they concur with the recommendation for no further action. It is anticipated that this site will proceed to land transfer in the fiscal year 2002/2003 time frame.



Source Removal—Septic Tanks at Technical Areas 21, 51, and 54

Project Description: During fiscal year (FY) 2001, six inactive septic tanks at Technical Areas (TAs)-21, -51, and -54 were characterized and removed as part of voluntary corrective actions (VCAs)/interim action (IA):

- Potential Release Sites (PRSs) 21-024(f) and 21-024(i) at TA-21;
- PRS 51-001 at TA-51; and
- PRSs 54-007 (c, d, and e) at TA-54.

The objectives of the VCAs/IA were to

- characterize, remove, and dispose of the waste remaining in the septic tanks;
- remediate (by excavation), as necessary, the inactive septic systems following Laboratory Environmental Restoration Project best management practices;
- collect confirmatory subsurface soil samples at each septic system;
- determine the nature and extent of soil contamination using the sampling data; and
- assess the potential human health and ecological risks from each septic system.

Accomplishments Description: The contents of each septic tank, and the septic tanks, were removed and disposed of in accordance with all applicable US Environmental Protection Agency, New Mexico Environment Department (NMED), US Department of Energy (DOE), and Laboratory requirements. VCA completion reports were completed for the septic tanks at TA-51 and TA-54 and submitted to the appropriate administrative authority (NMED for Hazardous and Solid Waste Amendment [HSWA] PRSs, and DOE for non-HSWA PRSs) with a recommendation for no further action. NMED has verbally stated that they concur with the recommendation for no further action for the two HSWA PRSs, based on a review of the VCA completion report. Confirmation sampling has been completed for the area adjacent to and beneath the two septic tanks at TA-21, and VCA/IA completion reports are scheduled for submittal the second quarter of fiscal year 2002.

CASE

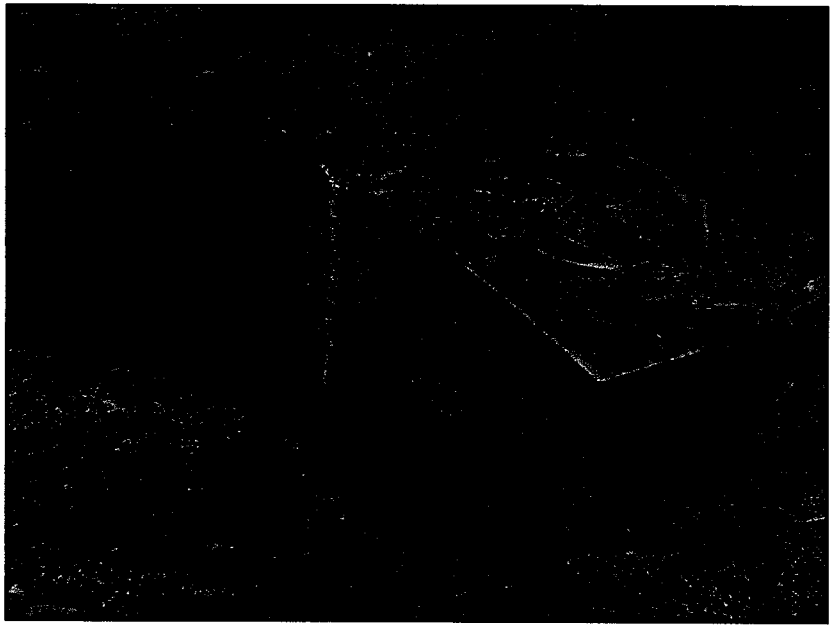
Assessment of Septic Tank Removal at Potential Release Site 21-024(i)

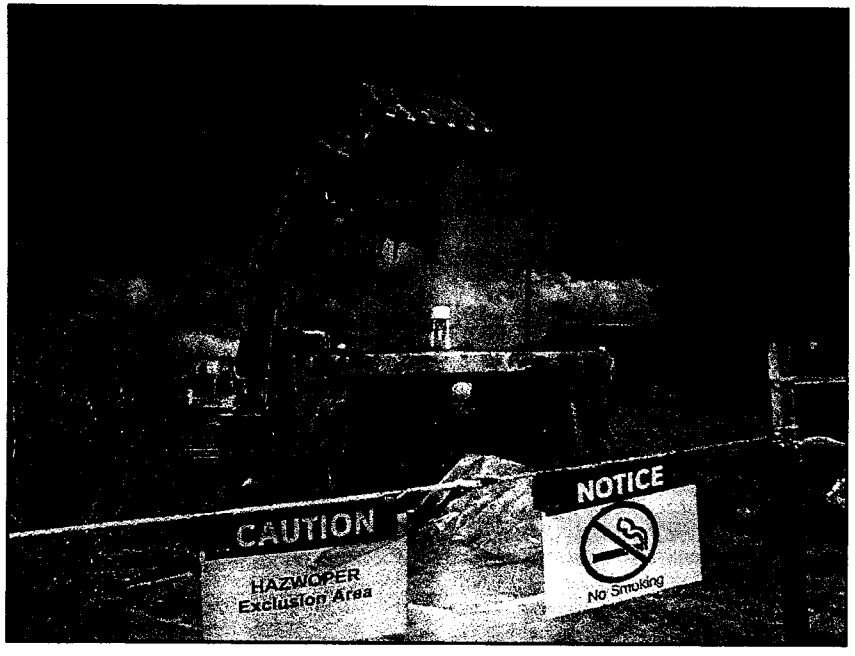
Project Description: This project involved the removal of a radioactively contaminated septic tank and associated lines from Potential Release Site (PRS) 21-024(i). This PRS is an inactive septic system that operated between 1945 and 1965 and is listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit. The septic system served Buildings 21-152, -166, and -167 at DP East. PRS 21-024(i) was composed of structure 21-181 (the concrete septic tank), 6-in. vitrified clay pipe inlet and outlet drainlines, and an associated outfall.

Chemicals of Concern: The primary chemical of concern at PRS 21-024(i) is tritium. Other radionuclides, metals, polychlorinated biphenyls, and volatile organic compounds were also detected in site characterization samples. Much of the fiscal year (FY) 2001 confirmatory data for this site has not yet been received.

Accomplishments Description: During FY 2001, Environmental Restoration Project personnel

- identified a path forward for disposal of the sludge remaining in the septic tank;
- removed and properly disposed of approximately 24 drums of mixed-waste sludge from within the septic tank;
- identified a path forward for disposal of the septic tank under the authorized limits, thereby avoiding generation of more than 20 cubic yards of mixed waste;
- conducted confirmatory sampling along the inlet and outlet lines and from within and outside of the tank footprint;
- excavated and decontaminated the septic tank and associated outlet line and a portion of the inlet line; and
- disposed of all wastes associated with the work and restored the site to its original condition.




CAUTION
HAZWOPER
Exclusion Area
NOTICE
No Smoking

Regulatory Compliance Focus Area

Tracking, Contracts, and Training

Project Description: The Tracking, Contracts, and Training Team is responsible for tracking regulatory history and current regulatory status of potential release sites (PRSs) as well as tracking future deliverables for the Environmental Restoration (ER) Project, serving on ER Project statement of work peer reviews, and developing and implementing a training tracking system for the ER Project.

Accomplishments Description: During fiscal year (FY) 2001, the team successfully accomplished the following:

PRS Database:

- designed and developed a standard query language (SQL) database and Access front end;
- migrated data into a new container and performed quality assurance on those data;
- developed numerous new fields and populated data into those fields;
- designed and developed an improved Web view for data extraction by all Laboratory employees;
- coordinated with the ER Project Communications and Outreach Team to complete approximately 600 PRS photos and populated the photo table in the PRS database;
- developed 902 new maps of PRSs and populated the map table;
- began developing a repository for all PRS-related regulatory documents;
- developed data consistency standards; and
- verified correct LA-UR numbers with the Laboratory Classification Group (S-7) database and ER identification numbers with the ER Project Records Processing Facility.

Training Database:

- completed the Training Database and Training Matrix System to ensure all ER staff, including subcontractors, are assigned the proper training requirements and completion of training requirements is tracked and
- implemented a complete training filing system in accordance with DOE Order 5480.20a.

Future Deliverables Tracking:

- developed the FY 2001 through FY 2006 Work Schedule through in-depth review of the baseline and coordination with focus area leaders and team leaders and submitted to NMED and
- tracked completion of regulatory deliverables and notified focus area leaders and team leaders of pending deliverable dates.

Contracts:

- chaired a number of peer reviews for statements of work.

Other Major Activities:

- planned development of the 2002 Solid Waste Management Unit Report in accordance with 40 CFR 270.14 and completed 40% of data accumulation for the report and
- completed drawing new boundaries for approximately 150 consolidated PRSs for the Geographic Information System/Facility for Information Management, Analysis, and Display System.

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 regulatory issues for activities within the Environmental Restoration (ER) Project. The team also coordinates the activities of the ER Project with those of other Laboratory groups.

Accomplishments Description: During fiscal year (FY) 2001, the team worked in several major areas and accomplished the following:

Resource Conservation and Recovery Act Compliance

- Updated several quality procedures for managing ER Project wastes.
- Reviewed documents prepared by the ER Project and participated in peer reviews as subject matter experts.
- Coordinated the ER Project's portions of Laboratory-wide responses to the New Mexico Environment Department (NMED) information requests related to the renewal of the Laboratory's Hazardous Waste Facility Permit.

Clean Water Act Compliance

- Inspected and maintained best management practices (BMPs) at 91 sites impacted by the Cerro Grande fire and published an annual report describing ER Project activities to reduce the migration of contamination from potential release sites as a result of the Cerro Grande fire.
- Completed surface water site assessments at nearly 300 sites.
- Completed an assessment of potential release sites containing polychlorinated biphenyls (PCBs) greater than 1 part per million (40 sites). BMPs have been installed at all 40 sites.
- Completed annual site compliance evaluations at more than 100 sites under the umbrella solid waste management units/stormwater pollution prevention plan.
- Developed and submitted to the NMED the annual BMP update describing the status of BMPs installed resulting from the Surface Water Assessment Team recommendations.

Waste Management Activities

- The ER Project reported a 53% reduction in waste generation (totaling approximately 3000 cubic yards reduced, versus approximately 5500 cubic yards generated) for FY 2001, with a significant portion of waste reduction being achieved from recycling and reusing more than 1500 cubic yards of waste materials generated by the cleanup at Material Disposal Area (MDA) P (in FY 2000, the US Department of Energy implemented a complex-wide goal of reducing waste generated by the ER Project activities by 10%), resulting in an overall savings of $10 million in disposal costs.
- Negotiated "no longer contained in" determinations with NMED for wastes containing low concentrations of hazardous wastes at three sites, resulting in a savings of more than $2 million in disposal costs.
- Demonstrated that 820 cubic yards of soil from MDA P and approximately 20 cubic yards of material from another site contained radionuclides at concentrations below the authorized limits, thereby allowing the waste to be disposed of as hazardous waste rather than mixed waste. This resulted in a savings of approximately $900,000 in disposal costs.
- Negotiated with the US Environmental Protection Agency concerning the disposal of more than 1700 cubic yards of soils containing less than 50 parts per million 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.
- Updated Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 120(h) reviews of the Manhattan Monument, Site 22, and White Rock Land Transfer parcels, and the Los Alamos County Water Production System.

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 fiscal year (FY) 2001, the team supported field activities and worked with the New Mexico Environment Department (NMED) to administratively complete sites, thus leading to no further action (NFA) recommendations and permit modifications. The team accomplished the following tasks:

Support to Focus Areas:

- Developed and submitted to NMED a general notice of intent to discharge for all regional wells drilled under the Laboratory's Hydrogeologic Workplan.
- Performed waste profiling and waste management support for all field locations where waste was generated, resulting in hazardous waste generation being avoided through negotiations with NMED and no Resource Conservation and Recovery Act (RCRA) violations being identified.
- Performed stormwater inspections and site stabilization activities at all active Environmental Restoration (ER) Project field activity locations.
- Completed certification of several staff for Westbay sampling and subsequently assisted Groundwater Investigations Focus Area in sampling Westbay-completed wells.
- Supported remediation activities associated with Cerro Grande fire and flood protection.
- Supported remediation activities associated with facility decontamination and decommissioning projects as well as facility construction projects.
- Submitted to the administrative authority notifications for all field activities.
- Completed field site closeout checklists.
- Participated in site tours and meetings with the public concerning current and future field activities.
- Provided authorized derivative classifier (ADC) review for ER Project documents, to expedite delivery to external organizations. Two staff members were certified as ADCs.
- Participated in facilitated High-Performance Team activities associated with material disposal areas (MDAs), site workoffs, and annual unit audits.

Permit Modifications/Site Workoffs and Closures:

- Assembled supplemental information to support the NMED Statement of Basis for three NFA proposals from previous permit modification requests. Two were submitted to NMED in FY 2001, and the third will be submitted in FY 2002.
- Prepared and submitted to NMED a Class III permit modification request for 24 new NFA proposals.
- Prepared and submitted to NMED the documentation supporting NFA for 16 new proposals.
- Gathered information to support approximately 66 PRSs as candidates for NFA.
- Prepared sampling and analysis plans, discussed/presented them to NMED, and coordinated verification sampling for 13 PRSs to confirm prior NFA proposals.

Potential Release Site (PRS) Reduction
2124 Original PRSs

Original NMED[a] SWMU[b]	1,099	Original DOE[c] AOC[d]	1,025
Removed NMED SWMU	(139)	Removed DOE AOC	(565)
Added NMED SWMU	177	Added DOE AOC	1
Consolidated Reduction of NMED SWMU	(582)	Consolidated Reduction of DOE AOC	(120)
All NMED SWMU	555		
Discrete NMED SWMU	406	Discrete DOE AOC	327
Consolidated SWMU	149		
No Further Action petition in progress	(59)		

a. NMED = New Mexico Environment Department
b. SWMU = Solid Waste Management Unit
c. DOE = Department of Energy
d. AOC = Area of Concern

Current Total PRSs = 837

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.

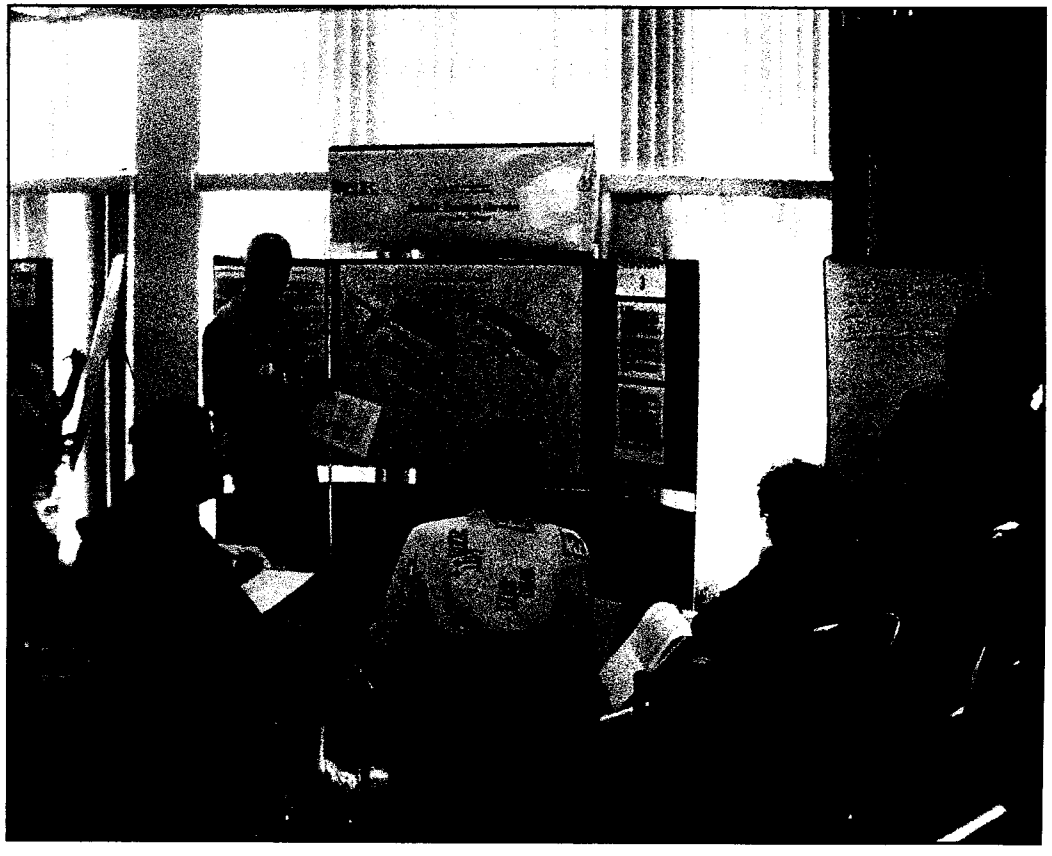
Accomplishments Description: During fiscal year (FY) 2001, the team worked in several major areas and accomplished the following:

Outreach activities included the following activities:

- coordinated seven public meetings and/or workshops;
- supported the Northern New Mexico Citizen's Advisory Board by attending monthly board meetings and monthly Environmental Restoration (ER) subcommittee meetings;
- completed and coordinated three property/land access agreements for Los Alamos County and San Ildefonso Pueblo;
- coordinated the ER Project Quarterly Meetings;
- coordinated various 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;
- photographed and/or video-documented more than 350 potential release sites for ER Project publications;
- continued maintenance and enhancement of the ER Project's external and internal ER Project websites.

Significant accomplishments for FY 2001 included

- created and produced more than 50 posters for external conferences or ER Project presentations and meetings;
- updated the Virtual Library on the ER Project external web page by enhancing functionality and options for access to ER Project documents;
- continued commitment to public service by volunteering at various community functions and coordinating fund raising events at the ER Project.



RCRA Corrective Actions Focus Area

RCRA Closure at Technical Area 16, MDA P

Project Description: Material Disposal Area (MDA) P is located at Technical Area (TA)-16 on the south rim of Cañon de Valle on the western edge of the Laboratory. The MDA P Landfill received waste from the S-Site Burning Grounds in 1950. Debris from WW-II-era buildings was also disposed of at MDA P. Operation of the landfill was suspended in 1984. Environmental Restoration Project personnel began the closure process at the landfill in 1997. The presence of detonable high explosives (HE) in the landfill required the use of a robotic excavator.

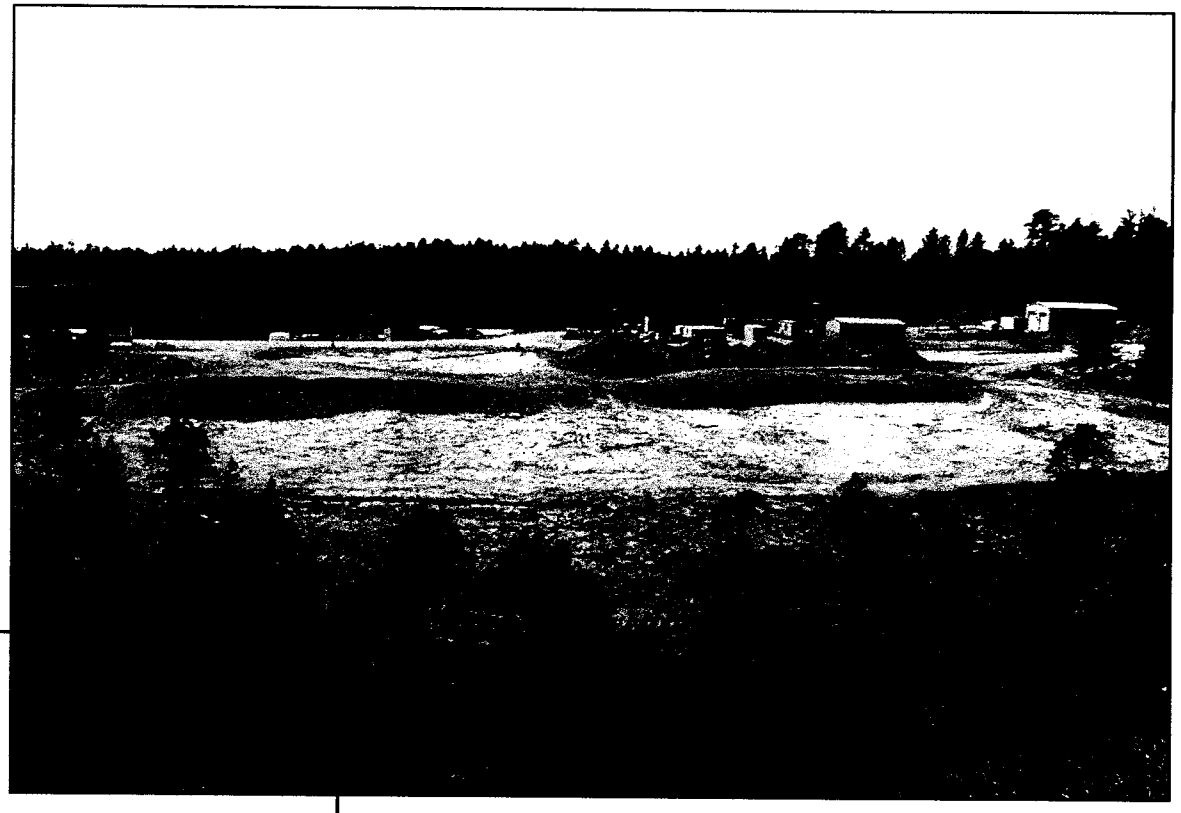
Chemicals of Potential Concern: The chemicals of primary concern found at MDA P included detonable HE, HE residues in soil, barium, and asbestos. MDA P also contained low levels of uranium and metals such as lead and cadmium.

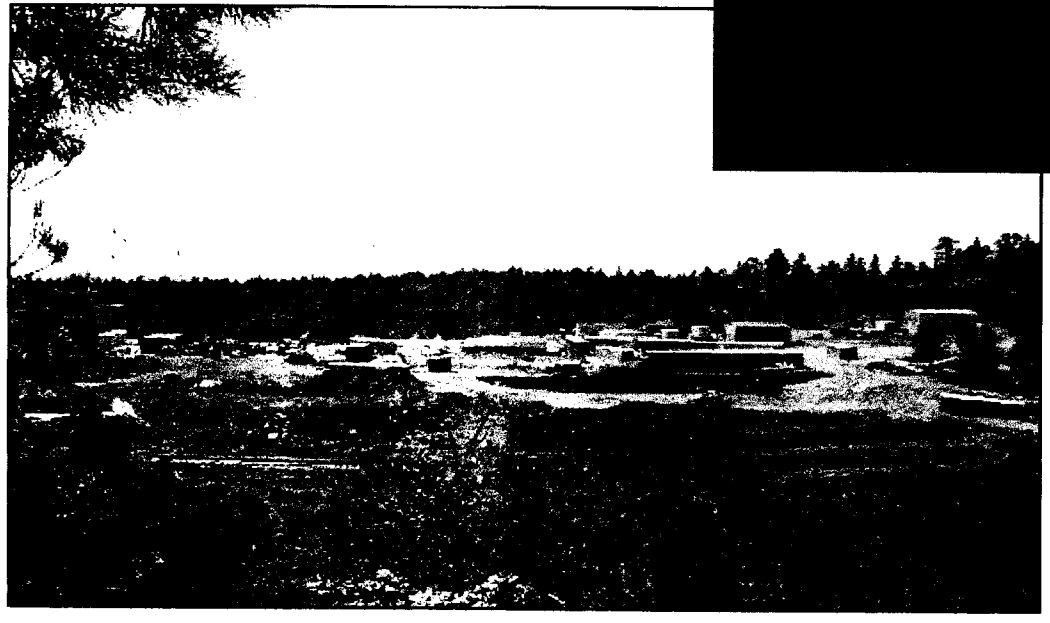
Accomplishments Description: Remote excavation of the landfill began in February 1999 and was completed on May 3, 2000, just before the Cerro Grande fire. Excavation of contaminated soil beneath the landfill using nonremote excavation methods resumed after fire recovery and was completed in March 2001. Phase II confirmatory sampling and geophysics measurements began in June 2001. During Phase II sampling, additional contamination was found. This material was excavated and is staged for off-site disposal pending completion of waste characterization analysis. Additional confirmation sampling will be completed when the waste is shipped.

More than 52,500 cubic yards of soil and debris were excavated (10,800 cubic yards during fiscal year [FY] 2001). During FY 2001, more than 26,700 cubic yards of material was shipped for disposal. This includes hazardous and industrial waste and recycled material.

Other disposal included:

- 387 pounds of detonable HE
- 820 cubic yards of hazardous waste with residual levels of radioactive contamination
- 6,280 pounds of barium nitrate
- 2,605 pounds of asbestos
- 200 pounds of mixed waste
- 235 cubic feet of low-level radioactive waste
- 888 containers that underwent hazardous categorization characterization





RCRA Corrective Actions Focus Area (continued)

Voluntary Corrective Action at Potential Release Site 00-019

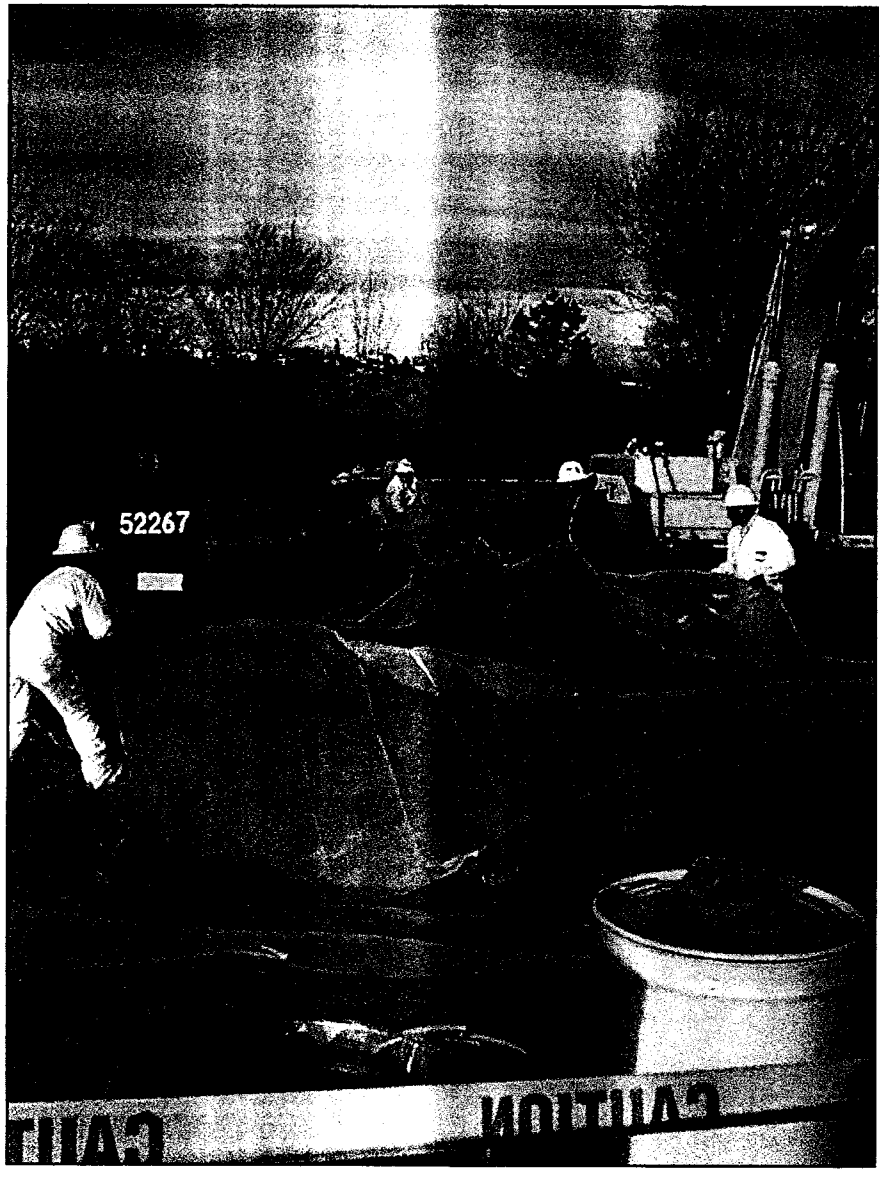
Project Description: Potential Release Site (PRS) 00-019 is located on property currently owned and used by Los Alamos County. It is the site of the county's former Central Waste Water Treatment Plant, which served the townsite and Laboratory's sanitary waste needs from 1947 until 1965. The site is located 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 Environmental Restoration (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 fiscal year 2001, ER Project personnel

- performed additional "hot spot" soil removal at the western outfall drainage;
- took additional confirmatory samples in the vicinity of the western outfall and further down gradient;
- supported NMED verification sampling in graduation canyon below both the east and west outfalls; and
- prepared and submitted the final VCA completion report to NMED.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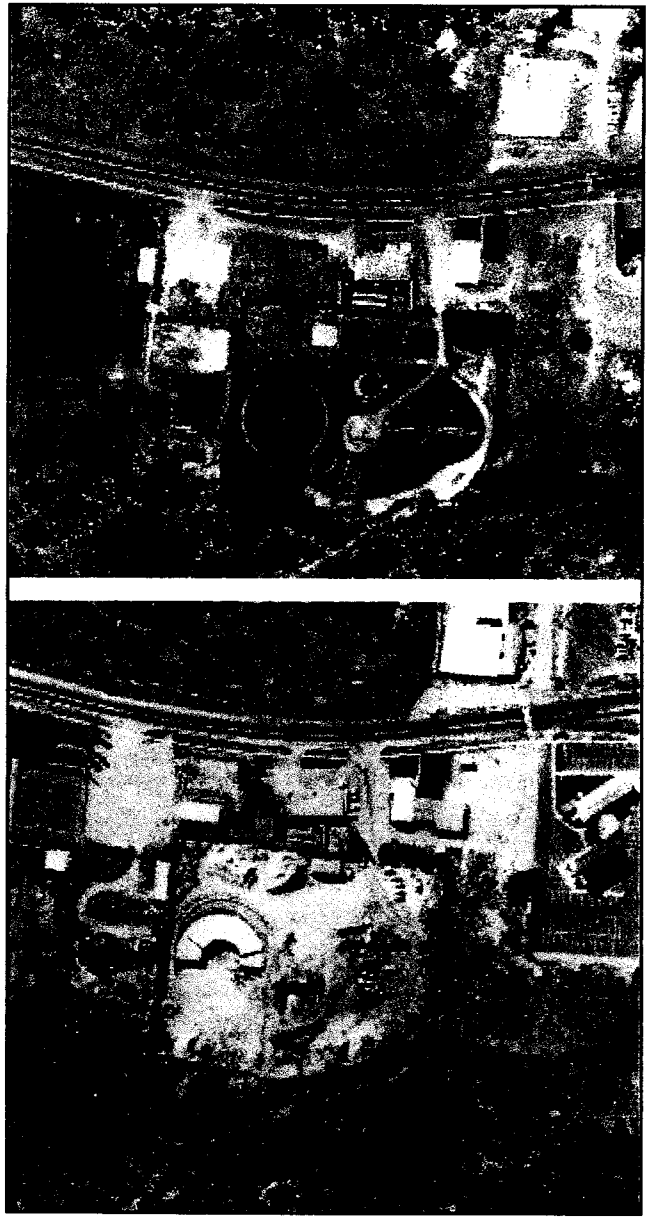


Data Analysis and Assessment and Interim Action Plan for Potential Release Site 53-002(a)

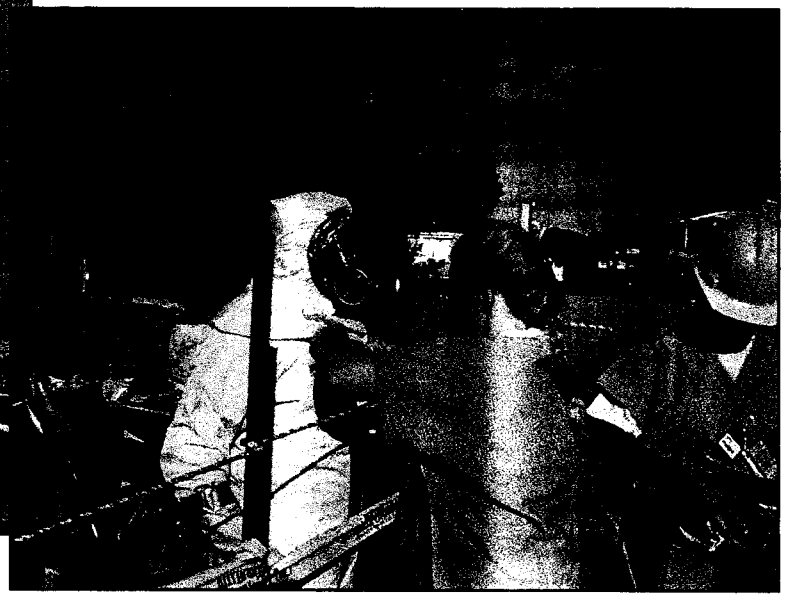
Project Description: Data analysis and assessment activities were conducted for the northern impoundments [Potential Release Site (PRS) 53-002(a)] and the surrounding area at Technical Area (TA)-53. The purpose of the assessment was to

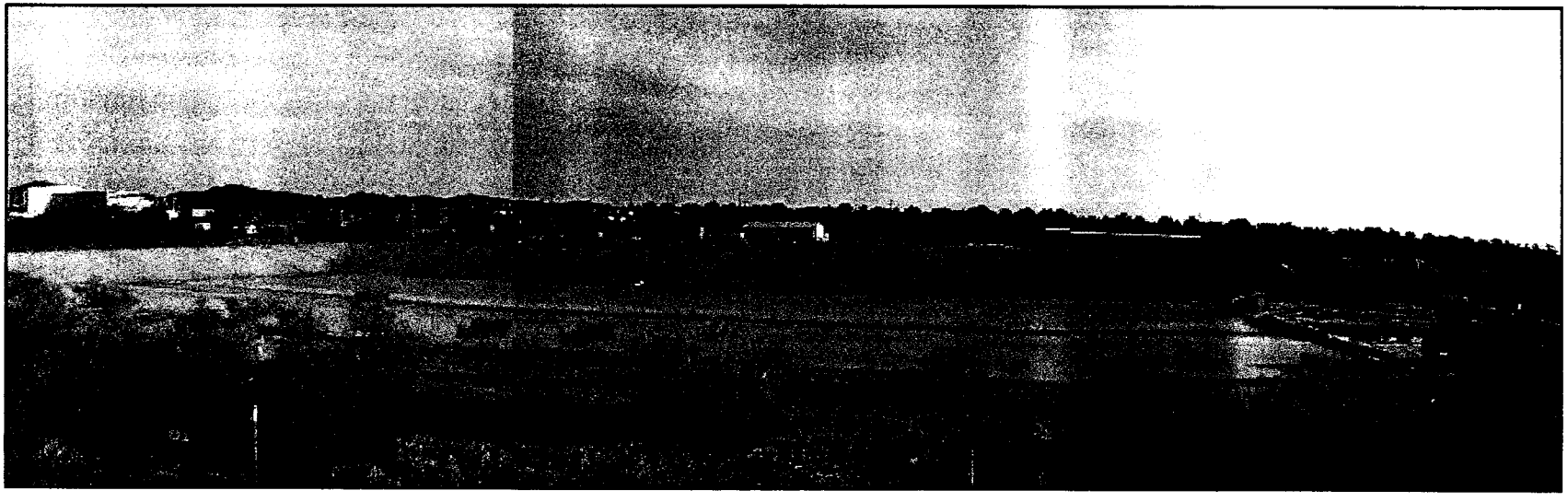
- determine if nature and extent has been defined for contaminants within the impoundments;
- identify chemicals of potential concern that will be carried further to a risk assessment phase;
- determine if a corrective action is necessary at this site;
- determine the need for a second round of borehole sampling currently proposed in the baseline; and
- determine if further sampling is necessary to define extent outside of the impoundments.

Chemicals of Potential Concern: Analysis of the data and preliminary risk assessments determined that the concentrations of the radionuclides and carcinogenic chemicals within the dried sludge and clay liner of both impoundments are greater than the target levels of 15 mrem/yr and 10^{-5} risk, respectively.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel

- completed the data analysis and assessment for the northern impoundments and identified the chemicals of potential concern that have data points above background and/or industrial screening values;
- completed preliminary risk assessment calculations;
- initiated planing for an interim action to reduce risk (a fact sheet was prepared and presented to the New Mexico Environment Department); and
- prepared an interim action plan that summarizes existing data and results of the assessment and describes the field activities that the Laboratory proposes to use to remove the dried sludge and clay liner within the boundaries of the northern surface impoundments.





Investigations in Tributary to Los Alamos Canyon below Technical Area 53

Project Description: This project consists of characterizing and assessing potential risk from contaminants in sediments located in a tributary to Los Alamos Canyon below the outfall from the impoundments at Technical Area (TA)-53. This canyon has received sanitary wastewater discharges from the impoundments at TA-53 from the early 1970s to 1993. This work is being conducted in collaboration with the Canyon Focus Area and is being integrated with the investigation of Los Alamos and Pueblo Canyons. The scope of the site characterization effort included geomorphic mapping, surveys, and sampling. This investigation will help determine whether corrective actions are necessary in the tributary canyon below the impoundments at TA-53.

Chemicals of Potential Concern: The primary concerns for potential human-health risk in this tributary of Los Alamos Canyon are cobalt-60, cesium-134, strontium-90, sodium-22, and tritium. Other inorganic and organic chemicals have been identified in sediments below the outfall as potentially being present at levels above background.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel

- conducted extensive characterization of sediments in the tributary to Los Alamos canyon below the TA-53 impoundments;
- collected 25 sediment samples from 3 different reaches in the tributary canyon (samples were analyzed for inorganic chemicals, organic chemicals, and radioisotopes); and
- completed geodetic surveys of the canyon and sampling locations.

Nature and Extent Well Cañon de Valle (CdV)-R-37-2

Project Description: Cañon de Valle (CdV) R-37-2 is a nature-and-extent-of-contamination well located in Technical Area (TA)-37. It is approximately 0.5 miles north of Water Canyon near the west end of TA-37, north of the K-Site Road.

The well was installed to help determine if the high-explosive (HE) contamination that has been detected in the perched and regional aquifers of Well R-25 in TA-16 extends to the southeast. Secondary objectives include (1) determining how fast both water and contamination, if present, have been moving toward Bandelier National Monument 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 main chemicals of concern are the HE, particularly RDX, HMX, and TNT, which were all detected in the R-25 well. However, they were not present in CdV-R-37-2, based on screening data collected during drilling.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel

- completed site preparation activities at the well site;
- completed drilling the CdV-R-37-2 nature-and-extent-of-contamination well to a depth of 1664 ft;
- installed a four-screen well in the borehole (three screens were located within the regional aquifer and one in a potential perched aquifer);
- installed a Westbay sampling system in the well; and
- completed hydrologic testing in the well.

No extensive perched zone, such as that found in well R-25, was detected.

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

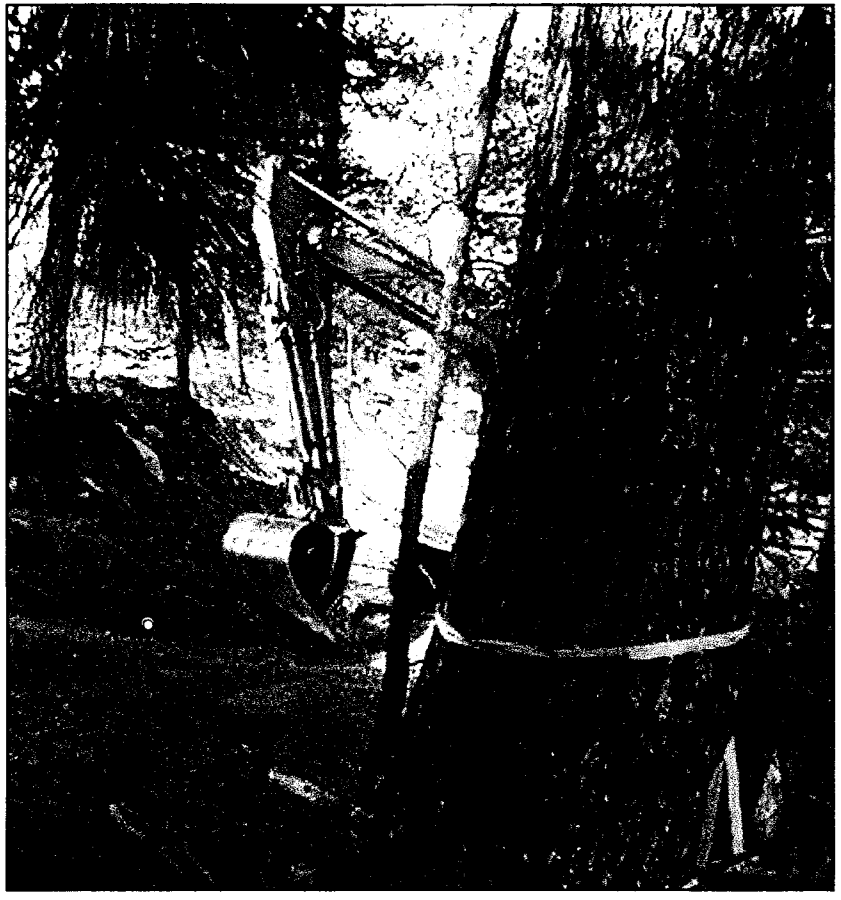
Project Description: This project is a voluntary corrective action to remove any soil that contained greater than 1 ppm polychlorinated biphenyls (PCBs) from Potential Release Site (PRS) 03-056(c), a storage area located northeast of the Johnson Controls Utilities Shop (Building 03-223). The Laboratory's electrical power-line maintenance contractor has used the area for storage of electric 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.

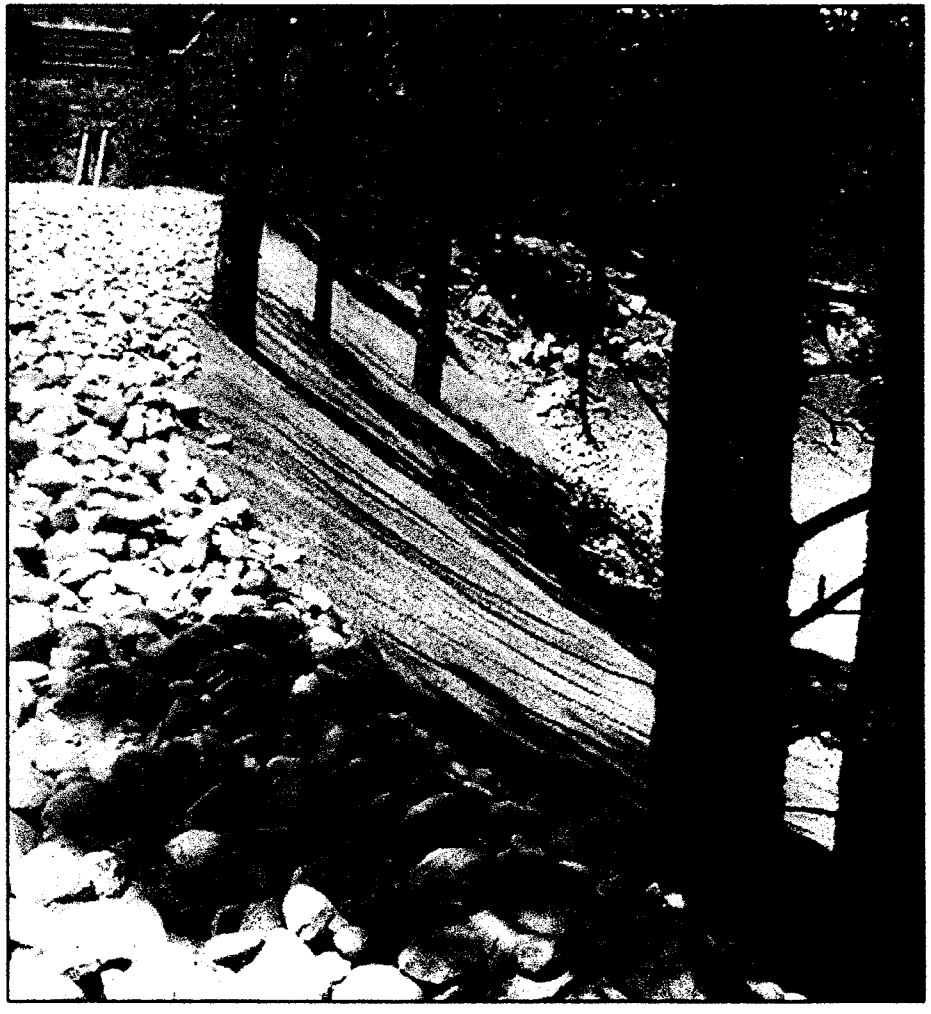
Chemicals of Potential Concern: Environmental Restoration (ER) Project personnel completed an expedited cleanup at this site in 1995, removing 1000 cubic yards of soil. Verification sampling indicated PCBs at concentrations greater than the US Environmental Protection Agency (EPA)-prescribed cleanup level of less than 1 ppm.

Other chemicals of potential concern at the site included mercury and tetrachloroethene.

Accomplishments Description: During fiscal year 2001, ER Project personnel

- removed and disposed of approximately 2400 cubic yards of PCB-contaminated soil from the site, including the removal of all sediments from the stream banks on the west slope area and from two drainages in the north area (additionally, the west slope, mesa top, and north slope have been excavated down to bedrock);
- collected 86 verification samples from a predetermined hexagonal grid and submitted them for PCB analysis (a subset [20 samples] were also submitted for volatile organic compound and metal analysis);
- completed site restoration activities;
- prepared and submitted a voluntary corrective action report to the EPA and the New Mexico Environment Department recommending no further action for this site.





Voluntary Corrective Action at Potential Release Site 00-003-99, the Los Alamos Area Office Land Transfer Site

Project Description: This project consisted of the remediation and confirmation of Potential Release Sites (PRSs) 00-003, 00-012, and 00-030(i). PRSs 00-003 and 00-012 have been consolidated into a new PRS known as 00-003-99. Consolidated Unit 00-003-99 is located at the western steam plant near the Los Alamos Area Office (LAAO) of the US Department of Energy (DOE) and consists of a container storage area and a steam generator blowdown tank and associated piping. PRS 00-030(i) is located along Trinity drive northeast of the LAAO building and was a sanitary septic tank that served the West Mess Hall, dormitories, post office, apartments, post exchange, and officer's lounge during the early- to mid-1940s.

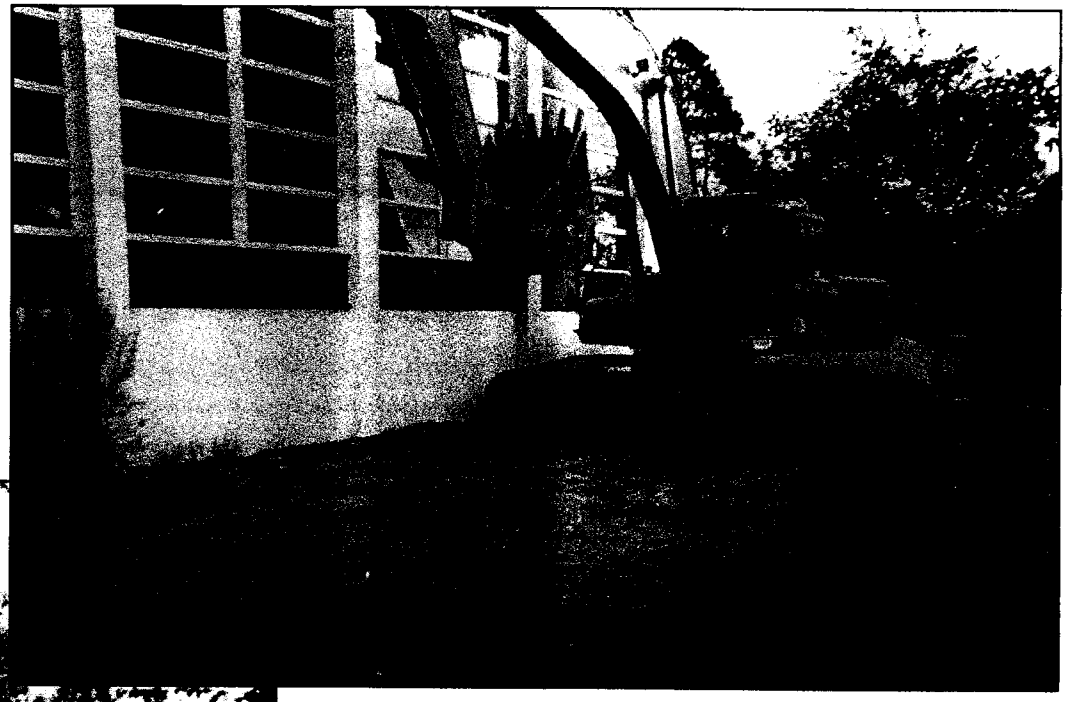
Chemicals of Potential Concern: The following chemicals of potential concern were identified during the execution of this corrective action:

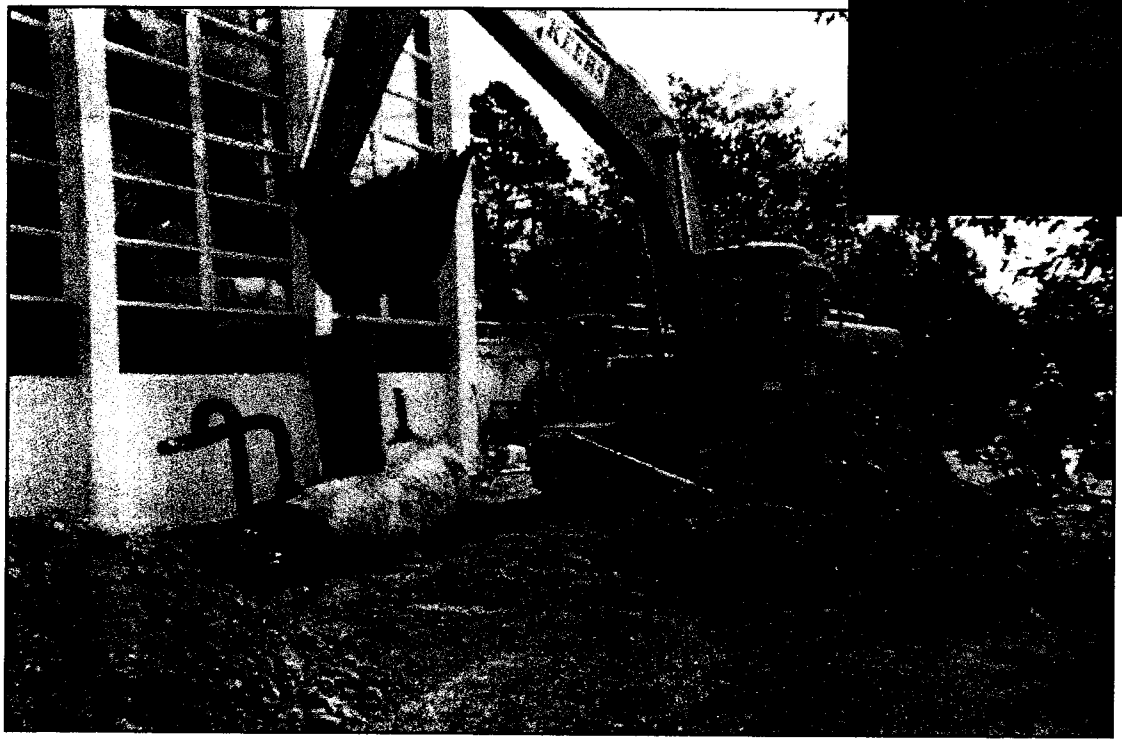
PRS 00-003 – Antimony, lead, mercury, and silver were identified as chemicals potentially impacting human health. Because this PRS is entirely subsurface, no potential receptors were identified as potential contributors to ecological risk.

PRS 00-012 – Antimony, barium, chromium, cobalt, copper, lead, manganese, mercury, selenium, and zinc were identified as chemicals potentially impacting human health. Because this PRS is also entirely subsurface, no potential receptors were identified as potential contributors to ecological risk.

PRS 00-030(i) – Extensive numbers of chemicals potentially impacting human health and ecological risk were discovered at low levels in the vicinity of this PRS; however, none was found to drive an unacceptable risk for either human or ecological receptors.

Accomplishments Description: During fiscal year 2001, Environmental Restoration Project personnel analyzed and interpreted data for the LAAO site and prepared and submitted the final voluntary corrective action completion report.

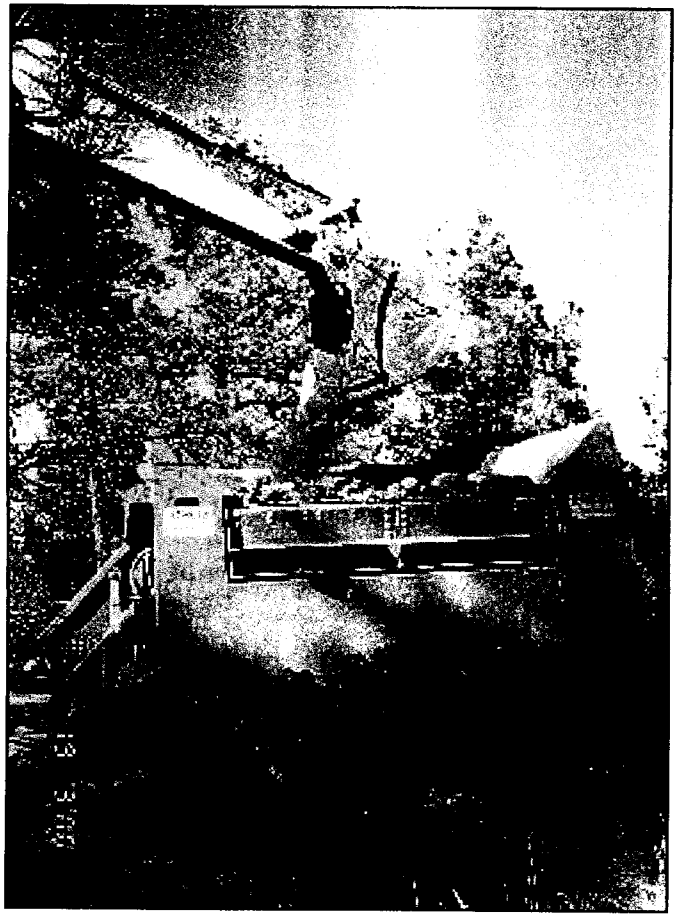




Cleanup of the Outfall at Building 16-260 [PRS 16-021(c)-99]

Project Description: Building 16-260 is the Laboratory's conventional high explosive (HE) machining facility. From 1951 to 1996, 13 sumps discharged HE-contaminated wastewater through the 16-260 outfall. Potential Release Site (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 RFI process, Environmental Restoration (ER) Project personnel determined that nearby soils; springs, seeps, Cañon de Valle, and other surface waters, and groundwater were contaminated with HE materials. PRS 16-021(c)-99 is the Laboratory's first corrective measures study/corrective measures implementation project.

Chemicals of Potential Concern: The primary chemicals of concern include the following HE compounds: HMX, RDX, TNT, and HMS. Barium is also a chemical of concern.

Accomplishments Description: During fiscal year (FY) 2001, ER Project personnel

- evaluated on-site and off-site waste treatment and disposal options and decided, working in concert with the high-performance team for the 16-260 outfall, to treat and dispose of the approximately 1500 cubic yards of wastes off-site;
- collected and evaluated verification sampling data;
- removed "hot spots" where elevated HE levels remained following the FY 2000 excavation; and
- performed site restoration activities.