FILE LANL HSWA: 4/1122/98-002(a,b)
5/1157/8-003(a)
2/1093/18-001(b)
COMP, LANL, 8/30/96/9/9/96, HRMS, EPA,

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

AUG 30 1996

SEP 1996 RECEIVED

Mr. Benito Garcia, Chief
Hazardous and Radioactive
Materials Bureau
New Mexico Environment Department
2044A Galisteo Street
Santa Fe, NM 87505

Re: Statement of Basis for Four Expedited Cleanups
Los Alamos National Laboratory (NM0890010515)

Dear Mr. Garcia:

Enclosed is a copy of a Statement of Basis for four Expedited Cleanups conducted at Los Alamos National Laboratory (LANL) during 1995. The Environmental Protection Agency (EPA) has drafted this document for the New Mexico Environment Department to complete a Class 3 permit modification initiated by LANL on April 24, 1995. The EPA has also included a computer disk with the files for the Statement of Basis. The figures used are not on the disk and will need to be copied for use or NMED will need to develop your own figures.

Should you have any questions, you may contact me at (214) 665-6785.

Sincerely,

David W. Neleigh, Chief
New Mexico and Federal
Facilities Section

Enclosure

15517

NMED ANNOUNCES STATEMENT OF BASIS

In this Statement of Basis, the New Mexico Environment Department (NMED) describes the proposed remedies for addressing contamination problems at four solid waste management units at the U.S. Department of Energy facility, Los Alamos National Laboratory, located in Los Alamos, New Mexico. Los Alamos National Laboratory (LANL) is owned by the Department of Energy (DOE) and operated by the University of California. This document is issued by NMED, the lead agency for site activities. NMED will select a final remedy for these four LANL sites only after the public comment period has ended, and the information submitted during this time is reviewed and considered in the decision-making process.

NMED is issuing this Statement of Basis as part of its public participation responsibilities under the **Resource Conservation and Recovery Act (RCRA)**. Words appearing in **boldface** are defined in the glossary at the end of this Statement of Basis. The Statement of Basis summarizes information that can be found in greater detail in the **Administrative Record**. A discussion of the nature and extent of contamination for each of these four sites is discussed in an **expedited cleanup plan** identified by site number. The site investigation and the development of the remedies were conducted by LANL and provided to NMED for review and approval.

A. COMMUNITY PARTICIPATION

NMED encourages the public to review the Administrative Record in order to gain a more comprehensive understanding of the RCRA activities that have ben conducted at LANL. The Administrative Record is available for review at the following locations:

[insert locations]

NMED welcomes public comment on all of the remedial alternatives described and on any additional options not previously identified and/or studied. Public input on all potential alternatives, and on the information that supports the alternatives, is an important contribution to the remedy selection process. NMED may modify the proposed remedy or select another remedy based on new and/or substantive information presented to NMED through public comments. Therefore, the public is encouraged to review and comment on all alternatives.

The public comment period for the Statement of Basis begins *[insert date]* and ends on *[insert date]*. During the public comment period, written comments must be postmarked by *[insert date]* and submitted to:

[insert contact and location]

NMED will address all comments received during the public comment

period in the Final Decision and Response to Comments document (RTC). The RTC will explain NMED's rationale for the remedies selected to address contamination problems at the four sites discussed in this Statement of Basis. The preferred remedies in the Statement of Basis are preliminary determinations and should other options be selected as the remedies, based upon public comment, new information, or a reevaluation of existing information, any significant differences from this Statement of Basis will be explained in the RTC. The RTC will be incorporated into the Administrative Record and made available to the public in the information repositories.

B. FACILITY DESCRIPTION

LANL is 43 square miles in size and is located adjacent to the town of Los Alamos, New Mexico. The facility is located on a mesa and canyon landscape with relief averaging about 300 feet from the tops of the mesa to the canyon bottoms. The majority of the building and technical areas (TAs) are located on the mesa tops.

LANL has been in operation since the early 1940's. It is a government owned (DOE) and contractor operated (by the University of California). LANL is the site of research and development for the first atomic bomb. Throughout its history, LANL has conducted experimental research on nuclear weapons and explosive materials. Disposal activities started in the early 1940's and continue to present day.

C.HISTORY OF INVESTIGATION

The Environmental Protection Agency (EPA) issued Module VIII, of the Hazardous and Solid Waste (HSWA) portion of the Resource Conservation and Recovery Act permit, on March 8, 1990, with the effective date of the permit being May 23, 1990. The original permit required investigation of 603 **solid waste management units (SWMUs)**. An additional, 497 SWMUs have been added to the permit by subsequent permit modifications making a total number of 1100 SWMUs requiring investigation under the RCRA corrective action process.

Under the corrective action process, LANL is required to determine the type, concentration and extent of hazardous waste released into the environment at all SWMUs. Upon completion of the investigation, LANL is to recommend corrective action options for each SWMU. Corrective action options must be approved by NMED. Currently, work plans for the investigation of the majority of sites requiring sampling and analysis have been approved.

D. SWMU INVESTIGATIONS

On April 23, 1995, LANL requested a Class 3 permit modification identifying final remedies for four SWMUs. EPA issued a Notice of Deficiency (NOD) on June 27, 1995, requesting additional information for these SWMUs. LANL submitted a response to EPA's NOD on August 8, 1995, and requested a Temporary Authorization to proceed with cleanup activities prior to completion of the Class 3 permit modification process. EPA granted LANL's request for a Temporary Authorization on August 17, 1995. A description of each of the SWMUs for which a final remedy is being proposed follows.

SWMUs 48-002(a) and 48-002(b), Surface Storage Areas:

SWMUs 48-002(a) and 48-002(b) are former container storage areas located adjacent to the south side of the Radiochemistry Laboratory, building TA-48-1 in Technical Area (TA) 48 (Figure 1). The SWMUs were addressed together during RFI characterization due to their physical proximity and because preliminary site characterization data indicate the presence of the same contaminants (metallic mercury and semivolatile organic compounds. The site measures approximately 220 square feet, and is located next to a building and bordered by paving.

TA-48 was established in 1957, and is the site of former and current operational structures built to house research work for radiochemistry and nuclear medicine. As early as 1976, approximately 200 2-quart metal flasks, each containing 76 pounds of triple-distilled high-purity mercury were stored at SWMU 48-002(a). The flasks were removed from that location in 1989.

SWMU 48-002(b) consists of an unpaved storage area where labeled and unlabeled drums were periodically stored. In 1986, a field observation report by LANL noted signs of spills at this SWMU, which the observer believed due to leaking drums. In 1991, a field activity data log noted that the drums previously observed had been removed.

Previous investigations of SWMUs 48-002(a) and 48-002(b) include a site evaluation under Phase I of the **Comprehensive Environmental Assessment and Response Program (CEARP)** and a Phase I **RCRA facility investigation (RFI)** under LANL's Environmental Restoration program. Under the CEARP investigation the two SWMUs were visited and field observations were noted, records were searched, current and former Laboratory employees were interviewed, but no samples were collected at the sites.

The RFI conducted at the sites consisted of two characterization sampling events. Surface and subsurface sampling was conducted at the site in July 1993. Five boreholes were hand augered at several locations to various depths with soil samples collected

at 1-foot intervals. One surface soil sample was also collected. During the sampling the surface soil was noted to be stained and "beads" of elemental mercury were readily observed in the soil.

All of the samples were submitted for analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and radionuclides; additional samples were collected and field analyzed for metals using an x-ray fluorescence (XRF) analyzer.

In October 1993, six additional surface samples were collected to evaluate possible mercury migration from the SWMUs. One sample was collected from sediment which had accumulated on a concrete pad associated with building TA-48-1. The other five samples were collected in areas downgradient of the site. All samples were submitted to a laboratory for mercury analysis.

Analytical results indicated the highest concentration of mercury (62 **parts per million** (ppm)) in soil was observed near the east end of the south wall of TA-48-1 at a depth of 0.5 feet. Mercury was detected near the **screening action level (SAL)** of 24 ppm on the concrete pad, and no mercury was detected in the samples collected downgradient of the SWMUs. In addition, SVOC concentrations for several hazardous constituents were detected above SALs with the primary constituent of concern being benzo(a)pyrene. Thorium-228 was detected at levels slightly above the SAL (1.5 picocurie/gram). No identifiable compounds were detected in the VOC analysis

Investigation results indicate that mercury and SVOC contamination is likely limited to a rectangular area that extends from the east corner of building TA-48-1 for approximately 20 feet along the south wall of the building, and from the wall to approximately 11 feet out toward the asphalt (Figure 2). The contamination extends generally to a depth of approximately 1 foot below the surface. The thorium activity, while slightly above the SAL, is within the range of LANL's background activity.

Potential impacts on humans and animals from this site include: inhalation (especially if the SWMUs are disturbed); ingestion; skin contact with contaminated soils; and migration of contaminant via surface water to sensitive environments.

SWMU 8-003(a), Septic Tank:

SWMU 8-003(a) is an inactive septic tank located in Technical Area 8 (TA-8) which is in the western part of LANL (Figure 3). The septic tank includes one manhole affiliated with the inlet line from building TA-8-1. SWMU 8-003(a) was installed in 1943 and served buildings TA-8-1 and TA-8-3. Building TA-8-1 served as a control center for an adjacent gun firing site, and after

World War II was used for explosives development and crystal growth experiments. Building TA-8-3 may have discharged explosives wastes and sanitary wastes to the tank. The septic system has been inactive since 1968.

The septic tank is estimated to be approximately 10 feet long by 4 feet wide by 4 feet deep with a 1,197 gallon capacity, and is constructed of precast reinforced concrete. The tank is approximately 90% full of a liquid and sludge mixture.

In 1971, liquid samples were collected from the tank, and the contents were found to contain volatile hydrocarbons and oil. During the RFI, four samples were collected from the tank (two in the liquid and two in the underlaying sludge) and analyzed for VOCs, SVOCs, metals, and high explosives (HE). A gross alpha/beta/gamma screening was also performed.

Analytical results indicated no elevated RCRA metals or radioactivity in the liquid or sludge, and elevated VOCs in both the liquid and sludge. No identifiable SVOCs or HE were found. Based on a preliminary review of the analytical data, the contents of the septic tank are considered RCRA hazardous waste due to the presence of multiple VOC constituents.

Potential impacts on humans and animals from this site include: inhalation (especially if the SWMU is disturbed); ingestion; and skin contact with contaminated soils or sediments.

SWMU 18-001(b), Sewer Line and Manholes:

SWMU 18-001(b) consists of an inactive sewer line and eleven manholes (Figure 4). Associated with this waste line are two septic lagoons (SWMU 18-001(a) which was investigated separately) and a single effluent outfall. This sanitary waste system served Technical Area 18 (TA-18), excluding Kiva Buildings 1, 2, and 3 which are served by individual septic systems. TA-18 was first used during the Manhattan Project beginning in 1944 for experimental test shots employing HE and various metals including depleted uranium.

During September and October 1993, samples were collected from the water and sediment remaining in seven of the manholes. Samples were analyzed for metals, SVOCs, VOCs, and radionuclides. Several of the manholes did not have enough sediment for a sample to be collected. Material in the manholes was considered indicative of material throughout the lines. During sampling it was noted that water from the shallow alluvial aquifer in the Pajarito Canyon floor was draining into and out of the sewer line via breaks in the line.

Sampling results indicated elevated levels of barium (9400 ppm) in one manhole, and lead (480 ppm) in another manhole.

Two other manholes had elevated levels of the SVOC, benzo(a)pyrene (0.3 ppm and 0.35 ppm), slightly above the SAL. Samples from the infiltrating ground water indicated concentrations of all analytes were below SALs. Less than 0.5 liters of sediment remains within any one manhole.

Potential impacts on humans and animals from this site include: inhalation, ingestion and skin contact with contaminated soils or sediments.

E. SUMMARY OF REMEDIAL ALTERNATIVES

A Corrective Measure Study was not conducted for any of these sites, and was not deemed necessary due to the uncomplicated nature of the sites. LANL did not evaluate alternatives other than the alternatives discussed below. The no further action alternative is discussed for all sites.

SWMUs 48-002(a) and 48-002(b), Surface Storage Areas:

Alternative 1: No Action

The "no action" alternative is often evaluated to establish a baseline for comparison. Under this alternative, NMED would take no further action at these sites to prevent exposure to the soil contamination.

Alternative 2: Soil Excavation

LANL proposes to excavate the contaminated soil in 1-foot lifts by using either shovels or a backhoe. Any visible contamination will be removed with a vacuum. After each lift of soil is removed, a mobile van will be used to analyze samples for mercury and SVOCs at each 3-foot by 3-foot grid within the excavated area. Final confirmatory samples will be sent to an off-site laboratory to confirm that proposed cleanup levels have been reached. Materials will be disposed off-site according to their waste type and the site-specific waste plan.

LANL proposes to use cleanup levels under an occupational land use scenario (generic worker exposures) and to achieve a 1×10^{-4} (one excess case of cancer in 10,000) cleanup level. For the constituents of concern this would mean a proposed cleanup level of 280 mg/kg for mercury and 80 mg/kg for benzo(a)pyrene.

NMED proposes an alternative cleanup level of 1×10^{-6} (one excess case of cancer in 1,000,000) under an occupational land use scenario. This would require LANL to excavate material until levels for benzo(a)pyrene reach 0.78 mg/kg. This cleanup level is more protective and should be the starting point for the cleanup. In addition, because the site will not be cleaned up to

residential standards, a deed restriction will be placed on the land to ensure that if the land use changes then the cleanup will be evaluated for adequacy under the new land use scenario. If this cleanup is deemed to be inadequate then LANL may be required to conduct further work at the site.

The proposed cost for this alternative is $76,600, and work including receipt of confirmatory analysis is expected to require approximately one month.

SWMU 8-003(a), Septic Tank:

Alternative 1: No Further Action

Under this alternative, NMED would take no further action at the site to prevent potential exposure to the soil contamination.

Alternative 2: Removal of Septic Tank Contents

LANL proposes to remove the septic tank contents, wash the interior of the tank, and fill the excavated tank with sand and/or pea gravel. Subsurface auguring and sampling would be used to confirm that a release of hazardous materials from the tank had not occurred. Materials from the tank would be properly disposed off-site in accordance with site-specific waste plans.

The proposed cost for this alternative is $40,095. The work including receipt of confirmatory analysis is expected to require approximately one month.

SWMU 18-001(b), Sewer Line and Manholes:

Alternative 1: No Further Action

Under this alternative, NMED would take no further action at the site to prevent potential exposure to the soil contamination.

Alternative 2: Stabilization of Sewer Line

The risk associated with the material in the manholes, based on a residential land use, is in the range of 10^{-6} to 10^{-5}. LANL proposes to decommission the sewer line in place, and each of the manholes will be filled with sufficient concrete to block the openings of the inlet and outlet ports of the sewer line.

Costs associated with this proposed remedy are estimated at $25,200. LANL expects to take two weeks to complete the remedy.

F. EVALUATION OF THE PROPOSED REMEDIES AND ALTERNATIVES

The following discussion profiles the performance of NMED's

proposed remedy against the four general standards for corrective measures and the five remedy decision factors, noting how the proposed alternative compares to the other options under consideration. The proposed remedy in each case is alternative 2.

1. Overall Protection of Human Health and the Environment

Alternative 1, "No Further Action", will not be considered further as a remedial alternative because it is not protective of human health and the environment. Each of the remaining alternatives provides some protection to human health and the environment.

2. Attainment of Media Cleanup Standards

a. SWMUs 48-002(a) and 48-002(b): Alternative 2 meets the cleanup standards. NMED proposes that the excavation continues until a cleanup level of 1×10^{-6} (one excess case of cancer in 1,000,000) under an occupational land use scenario is obtained. Material from the site has been demonstrated to migrate, and potential exists for materials to migrate to a nearby wetland. In addition, the point of departure for a cleanup starts at 1×10^{-6} and then may be lowered due to other circumstances at the site. NMED believes that this proposed cleanup level is easily obtained without a substantial increase in cost.

b. SWMU 8-003(a) and 18-001(b): Media cleanup standards were not set for either of these sites. Removal of the septic tank contents should results in a cleanup level in excess of 1×10^{-6}, and the current risk associated with the sewer line is already in the 10^{-5} to 10^{-6} range without removal of the material in the line.

3. Controlling the Sources of Releases

Alternative 2 will provide the most effective source control for all the sites.

4. Compliance with Waste Management Standards

Alternative 2 for all the sites would comply with all applicable waste management standards.

5. Long-Term Reliability and Effectiveness

Alternative 2 for all the sites should provide long-term reliability and effectiveness. SWMU 18-001(b) is the only site where contaminants will not be reduced; however, the site will be stabilized and the contaminants should not migrate.

6. Reduction of Toxicity, Mobility, or Volume of Wastes

Alternative 2 for all the sites effectively addresses toxicity, mobility or volume of wastes. None of the alternatives result in the permanent destruction of the contaminants instead the contaminants are either transferred to a permanent off-site disposal site or are stabilized in place.

7. Short-Term Effectiveness

Alternative 2 for each of the sites would have a minimal impact on the community, workers, and the environment during the remedial actions.

8. Implementability

Alternative 2 for each site utilizes existing technology and there should be no technical obstacles to prevent implementation of the proposed remedies.

9. Cost

Costs are presented in each alternative discussion and are based on estimates presented by LANL in the Expedited Cleanup Plans.

10. Community Acceptance

Comments from the community will be an important consideration in the final evaluation of remedial alternatives. All comments received during the *[insert timeframe]* public comment period and at the public meeting scheduled for *[date and address of meeting to be held]* will be addressed in the Final Decision and Response to Comments document. The Response to Comments will be drafted at the conclusion of the public comment period and incorporated into the administrative record. To send written comments or obtain further information, contact: *[insert contact with address and phone]*

G. NEXT STEPS

Upon completion of the public comment period, NMED will advertise the final decision. In addition NMED will notify the applicant and each person on the public comment mailing list of the final decision. The final decision will become effective thirty (30) days after service of notice of the decision unless a later date is specified or review is requested under regulation 40 CFR 124.19. If no comments are received to request a change in the final determination, the decision to approve the application will become effective immediately upon issuance.

GLOSSARY OF TERMS

Administrative Record - A collection of documents that form the basis for the remedy selection.

Comprehensive Environmental Assessment and Response Program (CEARP) - This program was established by the Department of Energy (DOE) in mid-1984 to examine compliance with federal, state, and local environmental regulations at DOE sites.

Corrective Measures Study - An evaluation of the alternatives for cleanup of sites contaminated with hazardous waste.

Expedited Cleanup - Selection and implementation of an obvious and effective corrective action, which meets treatment and disposal restrictions and other limiting criteria, during or following the RFI to expedite remedial action.

Parts Per Million (ppm) - Units of measure used to express concentrations of contaminants. For example: 1 ppm is equal to 1 mg/kg or 1 mg/l. Also 1 ounce of a substance in 1 million ounces of water is 1 ppm.

Resource Conservation and Recovery Act (RCRA) - This law authorizes the federal government to respond directly to releases of hazardous waste which may be a threat, or potential threat, to public health and the environment. Radioactive constituents are not addressed under RCRA. The law may be delegated to a state, and currently NMED is authorized to oversee corrective action activities in New Mexico.

RCRA Facility Investigation - An investigation to determine the nature and extent of contamination at a facility.

Screening Action Level (SAL) - A chemical concentration in soil or water below which there is no concern under RCRA for ingestion and inhalation, provided certain conditions are met as specified in 40 Code of Federal Regulations Section 264.521.

Solid Waste Management Unit (SWMU) - means any discernible unit at which solid wastes have been placed at any time irrespective of whether the unit was intended for the management of solid or hazardous waste.

FOUR GENERAL STANDARDS FOR REMEDY SELECTION			
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	**ATTAIN MEDIA CLEANUP STANDARDS**	**CONTROL THE SOURCES OF RELEASES**	**COMPLY WITH STANDARDS FOR MANAGEMENT OF WASTES**
• How alternatives provide human health and environmental protection	• Ability of alternatives to achieve the media cleanup standards. Media cleanup standards are the Federal and State statutory and regulatory requirements that a selected remedy must meet.	• How alternatives reduce or eliminate to the maximum extent possible further releases	• How alternatives assure that management of wastes during corrective measures is conducted in a protective manner

FIVE SELECTION CRITERIA FOR REMEDY SELECTION				
LONG-TERM RELIABILITY AND EFFECTIVENESS	**REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF WASTES**	**SHORT-TERM EFFECTIVENESS**	**IMPLEMENTABILITY**	**COST**
• Magnitude of residual risk • Adequacy and reliability of controls	• Treatment process used and materials treated • Amount of hazardous materials destroyed or treated • Degree of expected reductions in toxicity, mobility, or volume • Degree to which treatment is irreversible • Type and quantity of residuals remaining after treatment	• Protection of community during remedial actions • Protection of workers during remedial actions • Environmental impacts • Time until remedial action objectives are achieved	• Ability to construct and operate the technology • Reliability of the technology • Ease of undertaking additional corrective measures, if necessary • Ability to monitor effectiveness of remedy • Coordination with other agencies • Availability of off-site treatment, storage, and disposal services and specialists • Availability of prospective technologies	• Capital costs • Operating and maintenance costs • Present worth cost

MODIFYING CRITERIA	
COMMUNITY ACCEPTANCE	
• During the public comment period, interested persons or organizations may comment on the alternatives. EPA considers these comments in making its final remedy selection. The comments are addressed in the Final Decision and Response to Comments document.	