General
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LA-UR-86-2932

FINAL TRU WASTE INVENTORY WORK-OFF PLAN

LOS ALAMOS NATIONAL LABORATORY

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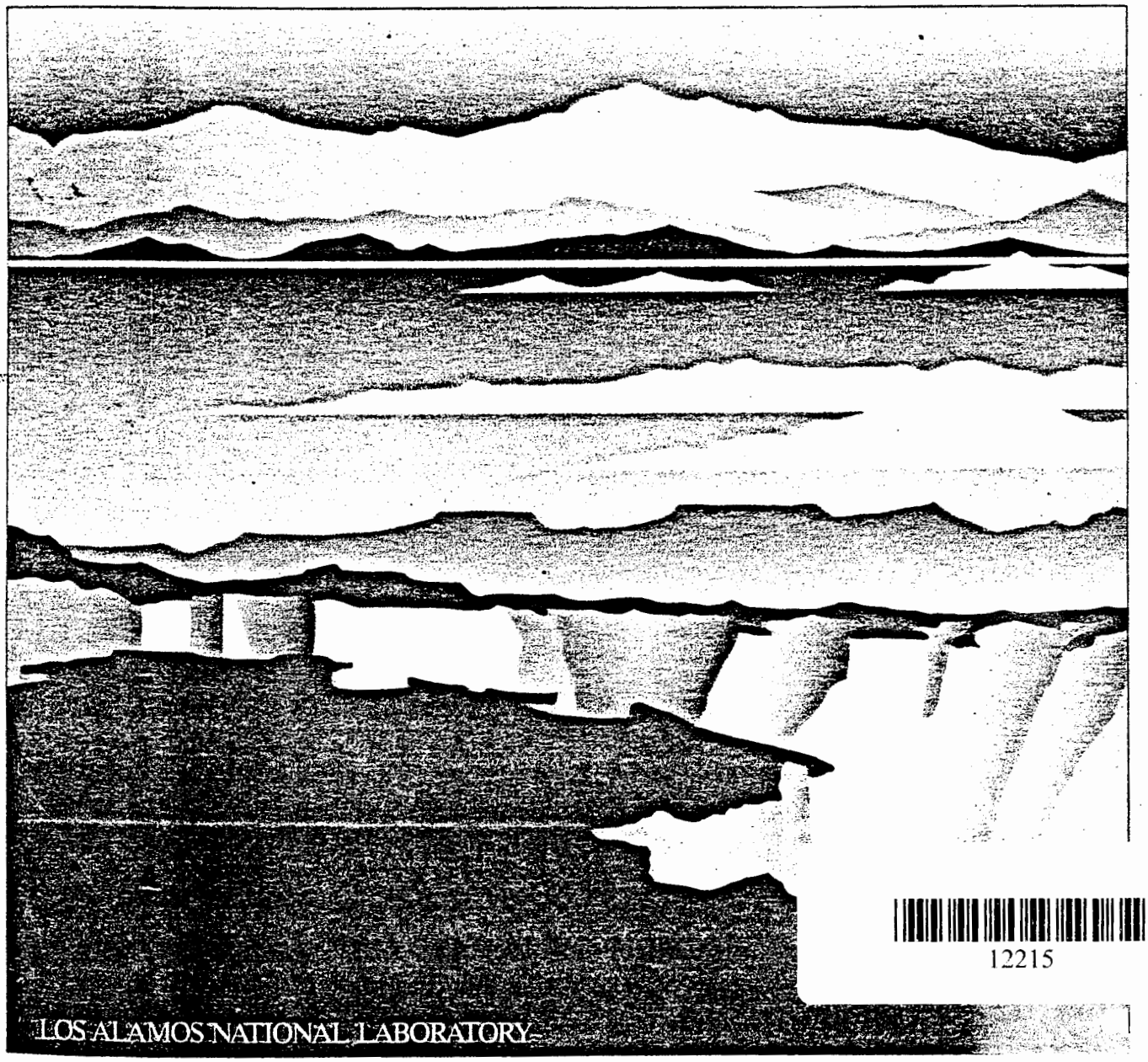
2204 General



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Revised 12/19/86

OUTLINE (annotated, with references)

Los Alamos Long Range Plan for Buried TRU Waste Management

(Note: Initials indicate who will prepare initial draft)

Stoller 1.0 Introduction and Purpose

- Funded by JIO
- Input to JIO's Comprehensive Implementation Plan for Defense Buried TRU Waste
- Responsive to requirements of Reference 1, which provided sites with a detailed list of areas to be included in input.
- Purpose from Ref. 1.

Stoller 2.0 Background

- LANL is managing its BTW sites as an integral part of CEARP.
- Brief description of CEARP (Ref. 2, 3, 4 and 5)
- LANL objectives include:
  - o Assure that all hazardous waste disposal sites (including BTW) are safely isolated from the biosphere by assuming the continued safety of sites or by planning/implementing remedial actions if required.
  - o To assure that long-term management of BTW sites is coordinated with, and consistent with, long-term management of all hazardous waste disposal sites, and that management activities are performed in accordance with applicable regulations. This is accomplished through implementation of the CEARP.
  - o To take those actions necessary to respond to unique technical, environmental, and institutional requirements existing at LANL.

Stoller/WJW 3.0 Buried TRU Waste and Waste Site Descriptions

- Operating history, records, waste contents, size, volume, location. Use data from Ref. 6, 7, modified by:
  - o Update Area T (Jay Wenzel to work with John Warren)
  - o Update Area A (redefinition based on 100 nCi/g) (Jay to work with John)
- HRS scores from CEARP

Stoller 4.0 Description of Known or Potential Problems: problem features, known migrations, status of site performance assessments (Ref. 6 or 7)

- Numerous environmental study and monitoring projects have been completed at LANL since 1944.

WJW 5.0 Additional Information Needs (state need, reason for need, plans - scheduling and funding)

- Historical review (never done in a detailed, comprehensive way: both TRU and hazardous). No present plans, no funding.
- A411 (Surface Monitoring Surveillance) update: Bring data up to date. Program began 1980, ongoing.
- New subsurface characterization (funding request submitted)

Stoller 6.0 Status of CEARP Actions on BTW Sites

- Since LANL is performing BTW site CERCLA activities as an integral part of CEARP, this section will focus on CEARP status for the 5 BTW sites. From Ref. 2 and 8.

Stoller 7.0 Description of CEARP Long-Range Plans

- As with Section 2, the LRP for BTW sites will be put into the context of CEARP. From Ref. 2, 3, 4, 5, and 8. This section will include a statement that plans for Phases 4 and 5 will not be determined until Phases 1 through 3 are completed.

Stoller 8.0 NEPA Strategy

- Ref. 4 (Paragraph 6.2.2)

Stoller 9.0 Estimated Schedules for BTW Site Work, Tied to the 5 Phases of Ref. 2

- Ref. 3 gives schedules through Phase 3. Schedules beyond Phase 3 will not (cannot) be determined until completion of Phase 3.

WJW 10.0 Cost Estimates for BTW Site Work, Tied to the 5 Phases of Ref. 5

- What is reference for costs for Phases 1-3?
- Costs for Phases 4, 5 will not (cannot) be determined until completion of Phase 3.
- Costs will be tied to CEARP and not necessarily specifically for the TRU component.

References

1. Ltr J.A. Detamore to Distribution, 9/10/86, RF 86-2883, "Buried Waste Implementation Plan".

2. Enclosure 27 to NOD response: "Information Supporting CEARP" (with attachments).

3. CEARP Phase 2: Generic Monitoring Plan (working draft), 7/86.

4. CEARP Phase 3: Technological Assessment Plan (working draft), 8/86.

5. DOE Order 5480.14, "CERCLA Program", 4/26/85.

6. "History and Environmental Setting of LASL Near Surface Land Disposal Facilities for Radioactive Wastes" (LA-6848-MS, 5/77).

7. "Alternative Transuranic Waste Management Strategies at Los Alamos National Laboratory", LA-8982-MS, 9/81.

8. Phase I CERCLA report (still in internal review: release not expected until January '87).

9. "Los Alamos Low-Level Waste Performance Assessment Status", LA-10768-MS, 6/86.

DRAFT

Los Alamos Long Range Plan for Defense Buried Transuranic Waste Management

1.0 INTRODUCTION AND PURPOSE

Los Alamos National Laboratory has been funded by the Joint Integration Office (JIO) to prepare a site long-range plan (SLRP) for defense buried transuranic (TRU) waste management. This work is being performed in support of a Comprehensive Implementation Plan (CIP) for Defense Buried TRU Waste, which will be prepared by the JIO. The purpose of the CIP and supporting SLRP's is described in Reference 1 as follows:

> "...to provide a description of the approach, resources, and schedules to ensure uniform, coordinated Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response at all DOE buried TRU waste sites."

Reference 1 describes the required contents of the SLRP's. This document addresses each of the specific items requested in Reference 1.

2.0 BACKGROUND

Los Alamos National Laboratory is managing its buried TRU waste (BTW) sites as an integral part of the Comprehensive Environmental Assessment and Response Program (CEARP). The CEARP is a phased program to identify, assess, and correct existing or potential environmental problems at DOE-Albuquerque Operations Office (DOE-AL) installations. The CEARP review covers major environmental regulations, such as the Resource Conservation and Recovery Act (RCRA), National Environmental Policy Act (NEPA), Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Toxic Substances Control Act (TSCA), and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Emphasis of CEARP is on CERCLA and RCRA. Details regarding CEARP are provided in References 2, 3, and 4.

CEARP is comprehensive in nature, covering multiple installations - of which Los Alamos National Laboratory is one - and multiple regulations, including CERCLA. In this way, CEARP ensures that installations within the DOE-AL complex are operated in full compliance with all applicable environmental regulations and that consistent criteria are applied when setting environmental priorities and funding for enhancements of existing programs or remedial actions where required. The CEARP is being implemented in five phases, which exactly parallel DOE Order 5480.14 ("CERCLA Program", Ref. 5):

PHASE 1 - Assessment of the Installation

Phase 1 objectives are to determine present compliance with environmental laws and to ascertain the magnitude of potential environmental concerns. Where insufficient data exist to accomplish this, the additional information necessary to complete the evaluation will be identified.

PHASE 2 - Confirmation

Phase 2 objectives are to (1) obtain information identified as necessary during Phase 1, (2) complete an environmental evaluation to confirm the presence or absence of potential environmental concerns identified in Phase 1, and (3) plan and carry out measurement and sampling programs as required to understand potential sources of contaminants and potential environmental pathways. Confirmed problems will be assessed for health or environmental risk as a basis for setting priorities for remedial action or other follow-up actions.

PHASE 3 - Technological Assessment

Phase 3 objectives are to develop plans for remedial actions or enhancements of existing programs by proposing and assessing alternative technologies and approaches to eliminate or control environmental problems identified as needing correction in CEARP Phase 2. The evaluation will include assessing the effectiveness of technology; impacts on health, safety, and the environment; and cost-benefit analysis, where appropriate. Phase 3 reports will include identifying or developing appropriate criteria and performing any evaluation of environmental impact required by NEPA.

PHASE 4 - Remedial Action

Phase 4 objectives are to implement recommended site-specific remedial measures identified in Phase 3, which could include engineering design and construction to remedy or control environmental problems.

PHASE 5 - Compliance and Verification

Phase 5 objectives are to (1) verify and document the adequacy of remedial actions carried out in Phase 4, and (2) identify and plan for any continuing monitoring requirements needed to demonstrate control of migration or adequately recognize future concerns.

Objectives for management of BTW sites at Los Alamos National Laboratory under the CEARP include:

- Assure that all hazardous waste disposal sites (including BTW sites) are safely isolated from the biosphere by assuring the continued safety of sites or by planning and implementing remedial actions if required.
- To assure that long term management of BTW sites is coordinated with, and consistent with, long term management of all hazardous waste disposal sites, and that management activities are performed in accordance with applicable regulations. This is accomplished through implementation of the CEARP.
- To take those actions necessary to respond to unique technical, environmental, and institutional requirements existing at Los Alamos National Laboratory.

Prior to 1970, there was no "TRU" waste definition, and radioactive waste contaminated with transuranic elements was disposed of as low-level radioactive waste (LLW). In 1970, DOE established a "TRU" waste classification, and any waste contaminated to greater than 10 nCi/g was stored for eventual retrieval and disposal at the Waste Isolation Pilot Plant (WIPP). Subsequently, DOE raised the cutoff between TRU and LLW to 100 nCi/g to determine if a burial waste site contains "TRU" waste, but since under CEARP all sites will be evaluated for risk on a consistant basis, the 100 nCi/g limit is somewhat academic.

3.0 BURIED TRU WASTE AND WASTE SITE DESCRIPTIONS

References 6, 7, and 8 contain detailed descriptions of Los Alamos National Laboratory near-surface land disposal facilities including Los Alamos National Laboratory BTW sites. This section summarizes this information as it applies to BTW sites.

Los Alamos National Laboratory is located 25 miles northeast of Santa Fe, New Mexico, and occupies 43 square miles of gradually sloping plateau which measures 10-15 miles wide and 25-30 sites long. The plateau terminates at a rim 300-1000 feet above the Rio Grande. The surface of the plateau is cut into many "finger mesas" by intermittant streams.

Los Alamos has a semi-arid continental mountain climate. Mean annual precipitation is 15 in.. Evapotranspiration exceeds annual rainfall. Precipitation penetrates no more than a few meters into the tuff on the mesa face. The tuff has generally less than 5% by weight moisture content.

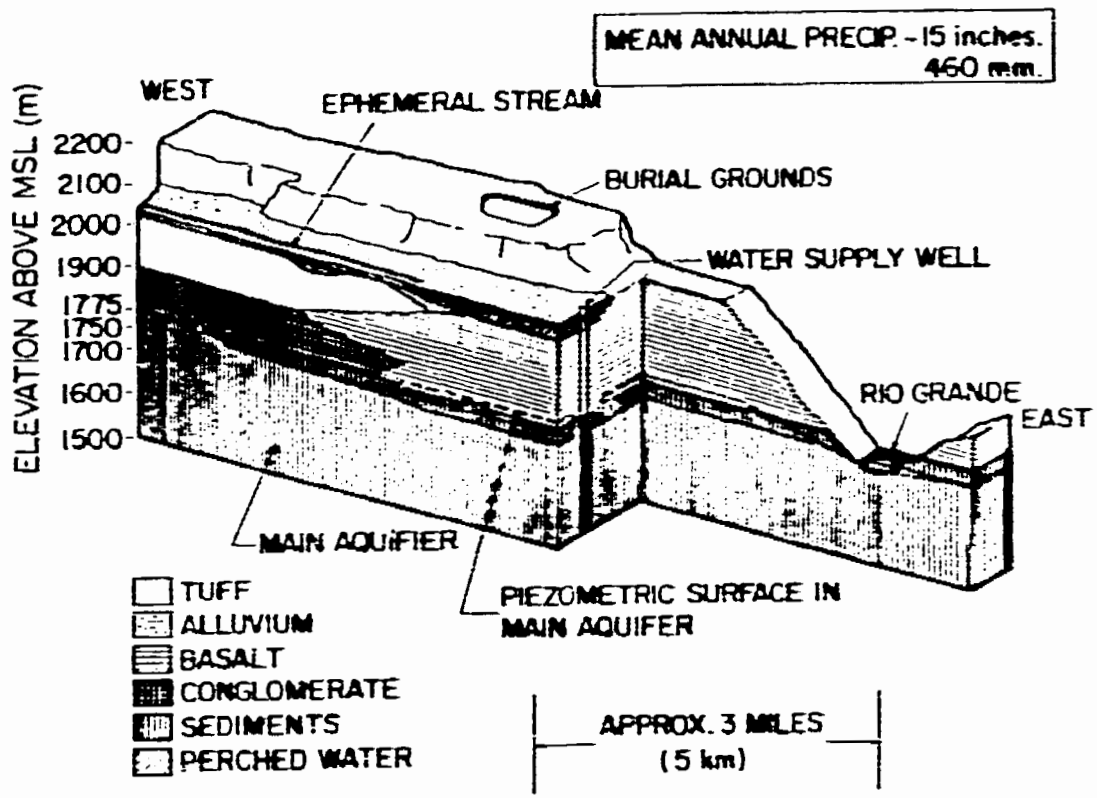
Ground (subsurface) water occurs as perched water in alluvia and basalts, in the Saturation Zone, and in sediments of the main aquifer, as shown in Figure 3.1. As water perched in the alluvium moves downgradient, it is lost by evaporation, transpiration, and infiltration. In some areas, perched water from the alluvium recharges perched water within basaltic rocks, which in turn discharges at the base of the basalt west of the Rio Grande. There is insignificant infiltration of surface water through the alluvium and tuff to the main aquifer.

Los Alamos National Laboratory has been disposing of radioactive wastes since 1944. Buried TRU wastes are, or may be, located at seven waste disposal areas. Areas A (tanks), C, G, T, and W definitely contain TRU waste. Areas A (pits), B, and V may contain TRU waste. Area U has been identified to contain alpha-emitter contaminants. With the exception of Areas T and V, all are primarily solid waste disposal areas. Areas T and V consist of absorption beds for liquid waste disposal. It is also noted that Area A includes two storage tanks. Area G is currently active as a waste storage/disposal area.

Table 3.1 summarizes in very general terms the buried TRU waste sites at Los Alamos National Laboratory.

FIGURE 3.1

LOS ALAMOS HYDROLOGICAL CROSS SECTION



Adapted from Figure 1.8 of Report LA-10768-MS, "Los Alamos Low-Level Waste Performance Assessment Status".

TABLE 3.1

CHARACTERIZATION SUMMARY OF BURIED TRU WASTE SITES

Disposal Area	Volume(m^3)(1)	TRU (Ci)(1)	Ci/m^3	Waste Form(2)(3)	Area(4) Total	Area(4) Waste(5)	Hazardous Substances
A (pits)	1.4×10^4	TBD	TBD	C/N	1.25	0.6	yes
B (pits)	2.1×10^4	7	3.3×10^{-4}	C/N	6	TBD	yes
C (pits)	1.0×10^5	180	1.8×10^{-3}	C/N	12	5	yes
C (shafts)	140	57	0.4	C/N	12	S	TBD
G (pits)	1.7×10^5	2.4×10^3	1.4×10^{-2}	C/N/S	63	8	TBD
G (shafts)	430	53	0.1	C/N/L	63	S	TBD
T (beds)	2.7×10^3	10	3.7×10^{-3}	CS	0.5	S	TBD
T (shafts)	3.8×10^3	4.0×10^3	1.1	CN	0.5	S	TBD
V (beds)	4.3×10^3	0.1	2.3×10^{-5}	CS	0.4	S	TBD

(1) From Table 4-2, Ref. 7.

(2) From Table 4-1, Ref. 7.

(3) C = combustible, N = non-combustible, S = sludge, L = liquid, CS = contaminated soil, CM = concrete monoliths

(4) Acres

(5) S = small

Area A was first used in 1945. Inactive material disposal Area A, located at TA-21, consists of five pits and two storage tanks and is described in detail in Reference 6. The storage tanks are known as the "General's Tanks". Waste solutions containing plutonium were stored in these tanks with the hope that chemical recovery processes would improve so that the plutonium in them could be recovered. Liquids in the tanks were removed for processing in 1983. The tanks presently contain a few inches of semisolid precipitate.

Four small disposal pits were first used in 1944, diposal records are poor or nil, but these pits are believed to contain solid waste contaminated with polonium (now decayed away), trace amounts of beta-gamma activity, and probably some trace amounts of long-lived alpha emitters (probably plutonium). These pits were used between 1944 and 1947. A larger pit, constructed in 1969, contains building debris from the decommissioning of several facilities at TA-21, including debris contaminated with ^{239}Pu, ^{238}Pu, ^{235}U.

Area A covers 1.25 acres; actual waste pits cover about half this area. Total volume number of the waste pits in about 14,000 m^3.

Area B is a series of pits used during the period 1944-48. The exact number and location of the pits is not well known, though the general area is known; waste disposal records from 1944 through January 5, 1947, have not been located. Estimates range regarding waste content.

The wastes consist primarily of solids with various radioactive contaminants, such as plutonium, polonium, uranium, americium, curium, and actinium. At least one truck contaminated with fission products from the Trinity test is buried there. At the east end, several small slit trenches were dug for chemical disposal. State-of-the-art disposal at that time was to open the chemical bottle, drain the chemical into the pit, and then throw the bottle into the pit. Chemicals disposed of there would include old bottles or organics, perchlorates, ethers, solvents, etc. Lecture bottles of mixtures, spent chemicals, old chemicals, and corrosive gases may be in these trenches. It is estimated (Ref. 6) that the entire pit area contains no more than 100 grams of ^{239}Pu, which, averaged over the entire area, is below 100 nCi/g, though specific locales may exceed 100 nCi/g.

Area B covers about 6 acres. The western two-thirds is covered by a layer of asphalt and used as a boat and tractor storage area. Total waste volume is about 21,000 m^3.

Area C consists of 7 pits used from 1948 to 1964 and 107 shafts used from 1958 through 1969. One pit was used exclusively for non-radioactive hazardous chemical waste. Detailed records exist after 1954 and specific shafts are definitely classified as TRU.

The types of radioactivity contaminated waste buried at Area C include building debris from the demolition of TA-1 and TA-10, routine contaminated trash, sludge from waste treatment plants, classified materials, and tuballoy chips from the shops. Plutonium-contaminated sodium loops from TA-35 were buried in shafts. Noncombustible classified waste was put in the west end of pit 5 in 1957.

About the chemical pit (pit #6), one reference states, " A variety of chemicals, pyrophoric metals, hydrides and powders, sealed vessels containing sodium-potassium alloy or compressed gases, and equipment not suitable for salvage, public dump or the contaminated dump have been placed in the pit. No high explosives have ever been put in this pit. Normal uranium powders and hydrides have been disposed of in this pit. Inadvertently some plutonium contaminated objects were placed in the pit . . . Because of the uranium disposal, it should be assumed that the pit is mildly alpha contaminated." It was mentioned that prior to the close-out of Area C, the safety office would "place approximately 200 gas cylinders which are full or partially full in this dump then cover the cylinders with approximately 10 feet of compacted fill . . . Any exploratory drilling must not be permitted and this disposal area should be clearly defined on drawings." Some full nickel carbonyl cylinders may have also been put in the chemical pit. Carboys of di- or triethylbenzene from the whole-body counter at TA-43 were dumped on the ground where the present solar panels are located. It is estimated that as of January, 1973, the Area C pits contained 26 Ci of ^{239}Pu, 149 Ci of ^{241}Am, and 25 Ci of uranium isotopes. About half of the shafts contain TRU wastes.

Area C occupies about 12 acres, with waste areas covering slightly less than half the area. Waste volume is estimated at 103,000 m^3 only 140 m^3 of which is in the shafts.

Area G began operation in 1957 and is still in operation. Area G occupies 63 acres and is the primary solid waste disposal and storage area at Los Alamos National Laboratory. It consists of over 21 pits, 2 tanks, and over 120 shafts. Detailed disposal records exist, and Area G is definitely classified as TRU. Pits 1-6 probably contain TRU and beta-gamma waste disposed before 1971. Pit #1 has 600 g of plutonium mixed with sand in thirty 30-gallon drums. Pit #2 contains drums of sludge with greater than 10 nCi/g TRU. This sludge is mixed with concrete. These first six pits occupy a surface area of approximately 580 m^2, with an estimated total pit volume of approximately 170,000 m^3. In addition, Pit #8 contains several drums of TRU waste. The waste volume in Pit #9 (used for storage from 1974 to 1979) is approximately 1,300 m^3, whereas the storage trenches contain approximately 240 m^3. All the other pits and trenches contain only low-level wastes (Ref. 7). Shafts in Area G have an estimated surface area of approximately 580 m^3 and total volume of approximately 430 m^3. Some of the shafts used before 1971 are thought to contain mixed TRU, MFP, MAP, and other low-level wastes. Generally, wastes with higher levels of radioactivity have been disposed of in shafts rather than in pits.

Area G burial pits and shafts contain tritium, mixed fission products, uranium, activation products, ^{239}Pu, ^{241}Am, and small amounts of other nuclides (such as ^{236}Pu, ^{237}Np, ^{230}Th, ^{232}Th, curium isotopes and others). Additionally, asbestos wastes and materials contaminated with PCBs are still placed in Area G. For the latter, an EPA permit has been obtained. Groundwater sampling for PCBs is done by sampling springs in White Rock Canyon.

Area T began operation in 1945 and is no longer in use. Four absorption beds were used from 1945 to 1952 for the disposal of untreated liquid wastes from plutonium processing, which contained low levels of plutonium and americium. The total surface area of the site is approximately 1,900 m^2. The absorption beds are trenches approximately 35 m long by 1.2 m deep by 6 m wide, excavated into the tuff. The beds were backfilled with coarse material, grading from

boulders in the bottom, through gravel, to fine sand at the surface. The total volume of the four beds is approximately 2,700 m^3.

A treatment plant was installed in 1952 for removal of plutonium and other radionuclides from liquid wastes. Residues from this treatment plant were mixed with cement and buried in Areas C and G. The beds were used infrequently between 1952 and 1967 for the disposal of a few hundred gallons of treated liquid wastes.

A new treatment plant was built in 1967. Since mid-1968, treated waste residues were mixed with cement in a pug mill and pumped down shafts augered between the two beds to the south side and the two beds to the north side. About 62 of these shafts were used for the disposal of mixed cement and neutralized americium strip, alkaline flouride, and plant sludge. The volume of these 62 shafts is approximately 3,800 m^3. About 56 of these shafts contain TRU waste, but 6 do not. These wastes were buried in the shafts before the 1971 decision regarding segregation and retrievability of TRU wastes.

Retrievable storage of TRU wastes is also conducted in Area T. Treated TRU wastes are mixed with cement and pumped into sections of CMP placed vertically in a pit. This pit is approximately 37 m long by 7 m wide by 6 m deep. Plutonium- and americium-contaminated aqueous waste from a holding tank is taken into a pug mill, mixed with cement, and the mixture is pumped into the vertical CMP sections approximately 6 m by 0.75 m. The estimated volume of the CM - is 480 m^3.

Aqueous wastes received at the treatment facility adjacent to Area T may be TRU wastes for retrievable storage, or nonretrievable wastes for burial. Retrievable wastes are mixed with cement and placed in the CMP sections; wastes for burial are mixed with cement and placed in the shafts.

Area V was used from 1945 to 1961 with three absorption beds receiving waste water from a laundry. These absorption beds were also similar to those described in Area T. The estimated surface area is 1,400 m^2 with an estimated volume of contaminated material of 4,300 m^3. Area V contained approximately 3 Ci of ^{90}Sr, ^{140}Ba, ^{140}La, and also 0.1 Ci plutonium at concentrations that

meet the 10 nCi/g definition of TRU wastes. The barium and lanthanum have half-lives measured in days and hours, and therefore, have all decayed. Area V is not considered to be a BTW site, but is mentioned because it contains some small amount of TRU waste.

4.0 DESCRIPTION OF KNOWN OR POTENTIAL PROBLEMS (Problem Features, Known Migrations, Status of Site Performance Assessments)

Reference 6 describes the environmental setting of Los Alamos National Laboratory and the specific geology and hydrology of the individual waste sites in great detail. Reference 6 also describes in great detail the environmental studies and monitoring performed as of 1977. Reference 7 discusses alternatives for TRU waste management and contains information current as of 1981 regarding disposal site and waste characteristics, and known problems. Reference 9 reviews Los Alamos National Laboratory studies done to assess the containment of buried hazardous wastes: environmental studies, operational source terms, transport pathways, environmental dosimetry, and computer model development and use.

Current waste disposal practices are in accordance with established Los Alamos guidelines, which reflect DOE criteria for shallow land burial. The Los Alamos guidelines prescribe procedures for construction of the disposal pits, waste burial, water drainage, maintenance, revegetation, and environmental monitoring. The guidelines were formally promulgated in April 1974 and revised in December 1980. Continuing studies have not revealed any hazards attributable to disposal practices.

Waste site maintenance activities include upkeep of roads, fences, signs, monuments, and surveillance equipment; erosion control; slumping pit surface maintenance; and control of intrusion by plants and animals. Surveillance activities include air sampling, moisture analysis, meteorological measurements, dose rate measurements, plant uptake analysis, soil sampling, and animal ingestion analysis.

Nine radioactive solid waste management sites are monitored at Los Alamos National Laboratory: A, B, C, E, F, G, T, U, and V. Monitoring includes:

- External penetrating radiation (TLD's at perimeter). Only Area T showed readings above (slightly) background.

- Radionuclide concentrations in soil and bedrock. Some migration was detected around the perimeter of Area and C and some tritium migration around Area C. he plutonium levels were 30 times below DOE remedial action guidelines (DOE 1983). No contamination is evident beyond the immediate vicinity of the sites. There is evidence of some transport of surface contamination (^{239}Pu and ^{240}Pu) by runoff from Area G. Some migration of plutonium has been detected from Area T, but this has been tied to deliberate flooding in 1961, and no additional migration is expected.

- Air sampling has shown no levels above 0.034 controlled area concentrations. Some tritium release has been detected, at less than 1% of the concentration guide for uncontrolled areas.

- Groundwater transport. There is no evidence of recharge to underlying aquifers, or to perched water in the alluvium, from precipitation that might enter the waste material. Some tritium has moved away from older shafts through the tuff, but concentrates were reduced to below MPC within a few meters, and none went below 20 m of the surface.

5.0 ADDITIONAL INFORMATION NEEDS (state need, reason for need, plans - scheduling and funding)

- Historical review (never done in a detailed, comprehensive way: both TRU and hazardous). No present plants, no funding.
- A411 (Surface Monitoring Surveillance) update: Bring data up to date. Program began 1980, ongoing.
- New subsurface characterization (funding request submitted).

6.0 STATUS OF CEARP ACTIONS ON BURIED TRU WASTE SITES

6.1 Status of CEARP Program

Evaluation and management strategies for defense TRU waste buried at Los Alamos National Laboratory are being incorporated into the Comprehensive Environmental Assessment and Response Program (CEARP). CEARP activities to identify, assess, and correct existing and potential environmental concerns are proceeding in a five-phase program as described in Section 2.0 above and in References 2, 3, 4 and 8.

CEARP Phase I tasks to determine present compliance with environmental laws and to identify the magnitude of potential concerns are in progress and are targeted to be completed at the end of FY 1987. Sites that have been contaminated or are suspected of being contaminated as a result of former or current practices, including leaks and spills, are being identified. Sustantial effort remains to complete the Phase I process and is discussed later in this report.

Specific objectives of the CEARP Phase I study are to provide documentation for the corresponding DOE CERCLA order (Ref. 5) and for the following EPA CERCLA preremedial activities: (1) Federal Facility Site Discovery and Identification Findings (FFSDIF) -- notification of newly discovered sites, including notification of negative findings, (2) Preliminary Assessment (PA), (3) Site Inspection (SI), and (4) Hazard Ranking System (HRS) evaluation. Where insufficient data exist to accomplish these activities, the additional information necessary to complete the evaluation is being identified.

In FY 1985 and 1986, Phase I activities have received approximately 6 man years of effort. Implementation of Phase I has been structured into eight subtasks:

<u>Records Search and Literature Survey</u>. An extensive records search and a literature survey have been conducted. Substantial additional documents need to be reviewed. The types of documents reviewed to date include:

- environmental documents
- development or management plans
- environmental monitoring reports
- federal/state/local permits
- operational records/documents
- safety analysis documents
- standard operating procedures
- appraisals, audits, inspections
- contingency/emergency plans
- special/topical studies or reports
- history and mission documents
- accident/incident investigation reports

Employee Interviews. Interviews at Los Alamos are being conducted as needed during the Phase 1 review process. Employees or retirees who were identified as having potentially useful information were contacted. If locally available and willing, they were interviewed directly. If the information was modest in nature or if distances were too large, interviews were conducted by telephone. To date, there have been 24 direct and 30 telephone interviews to help develop an overview of past facility operations. In each interview category, about half of the people contacted had worked at Los Alamos during World War II. Persons interviewed were asked to describe operations in their area of expertise, including waste handling and clean-up procedures and spills or other instances that could have resulted in environmental contamination.

It is important to remember that the information collected represents individual recollection of events and conditions that happened as many as 42 years ago. This information was used as an indicator of potential environmental concerns and cannot be taken as documented proof of environmental perturbations. The intent is to have definitive documentation by the end of Phase 2 confirming the presence or absence of any environmental problems.

Evaluation of Waste Management. Present and past management practices for hazardous substances are being reviewed and evaluated. Information for this process was gathered during the CEARP records search and literature survey, employee interviews, and investigation of current operations at Los Alamos.

Identification of Contaminated Areas. Sites that have been contaminated or are suspected to be contaminated as a result of current or former practices, including leaks and spills, are being identified. Information for this process is

being gathered during the CEARP records search and literature survey, employee interviews, and investigation of current operations at Los Alamos.

Evaluation of Compliance with Environmental Regulations. An evaluation of compliance with applicable environmental standards and regulations, including DOE orders and internal guidelines, is being conducted. pecial emphasis was placed on those regulations that interact with CERCLA (e.g., permitted releases under the CWA or CAA that exceed reportable quantities under CERCLA).

Preliminary Physical Survey. A preliminary physical survey of portions of Los Alamos is being conducted to validate observations from the CEARP document search and interviews and to identify any other signs of environmental stress or facility features that might indicate a potential for contamination.

Pathway Evaluation. A preliminary evaluation of potential migration pathways for hazardous substances is being made.

Hazard Ranking System (HRS) Evaluation. The HRS is used by EPA to establish a National Priorities List of facilities for initial attention under CERCLA. The EPA HRS, however, does not discriminate among different radionuclides relative to their potential risk. Therefore, DOE developed the Modified Hazard Ranking System (MHRS), which is a conceptually minor modification/addition to the HRS. The MHRS permits a better assessment of existing radiological risks. Therefore, potentially radioactive sites are scored with DOE's MHRS and EPA's HRS, and nonradioactive sites requiring HRS evaluation are scored with the EPA's HRS. The HRS and MHRS scores are being used for prioritizing sites potentially requiring remedial action during subsequent phases of CEARP.

To date, the Phase 1 process has identified 128 sites that require some Phase 2 (monitoring/characterization) and/or Phase 3 (technological assessment) efforts. Three subgroup rankings have been assigned to the sites in order to facilitate evaluation of their relative priorities and level of effort.

The first grouping is the CEARP Priority defined as follows:

- o High - Significant regulatory compliance problem or significant environmental risk.
- o Medium - Potentially significant regulatory compliance problem or potentially significant environmental risk.
- o Low - Potentially small regulatory compliance problem or potentially small environmental risk.

The second grouping is based on the inclusion of a site in the Inventory of Federal Agencies Hazardous Waste Activities in January 1986 (RCRA Section 3016) as follows:

- o Category A - Site was listed for DOE to include on the Inventory.
- o Category B - Site was identified to DOE as being potentially eligible for including in subsequent updates of the Inventory, but insufficient information was available in January 1986 for determination.
- o Category C - Site is not presently believed eligible for the Inventory.

The third grouping is a subjective estimate of the amount of effort likely to be required to complete CEARP Phases 2 and 3 for the site. These designations are simply large, medium, and small for use in estimating staffing requirements and budget planning.

There are approximately 147 sites where subsequent action is yet to be determined. It is anticipated that when Phase 1 efforts are completed, additional sites will require Phase 2 and/or Phase 3 follow-up action.

6.2 Status of Buried TRU Waste Sites

The CEARP review process is addressing buried TRU wastes located at the six waste disposal areas identified in the Los Alamos National Laboratory FEIS (Ref. 10). These areas are described above in Section 3.0 and are summarized as:

- o Disposal Area A - 2 storage tanks/5 pits
- o Disposal Area B - various pits and chemical trenches
- o Disposal Area C - 6 pits/1 chemical pit/107 shafts (lined and unlined)
- o Disposal Area G - various pits, trenches, and shafts
- o Disposal Area T - 4 absorption beds/various shafts
- o Disposal Area V - 3 absorption beds

In addition, two other sites that may contain very small quantities of buried TRU waste or other alpha-emitters are being investigated :

- o Disposal Area U - 2 absorption beds
- o Disposal Area W - 2 vertical tubes (4-in. ∅ x 120 ft.)

Identification and evaluation of leaks and spills which may have resulted from current or former operational practices are within the scope of the CEARP Program. While TRU contaminated sites may be identified, the Los Alamos National Laboratory Buried Waste Implementation Plan treats them as such and does not attempt to anticipate their potential cost and schedule impacts.

Table 6.1 summarizes CEARP evaluations of buried TRU waste sites, based upon early 1986 findings. Comparison of Table 3.1 with Table 6.1 suggests that there is very little difference in site HRS/MHRS scores, although some sites have a relatively high TRU content. Common scoring of sites within the same watershed contributes to this.

A discussion on the status of CEARP actions on each buried TRU waste site is presented on the following pages. Section 3.0 provides more detail on individual site and waste characteristics.

6.2.1 Material Disposal Area A

Background -- Material Disposal Area A, located at TA-21, is inactive and consists of five pits and two storage tanks.

Site stabilization was done in FY 1985 and included sealing and covering openings in the tanks to prevent any further water entry, removing surface contamination, adding cover material, recontouring, and reseeding the area.

This site undergoes routine radiological monitoring sponsored by the Interim Waste Management Program (IWMP) of DOE's Office of Defense Waste and Transportation Management.

TABLE 6.1

CEARP EVALUATION OF BURIED TRU WASTE SITES

Material Disposal Area	Active/ Inactive Area	CEARP Priority	RCRA Category	Site Effort	Hazard Ranking System[1] HRS	Hazard Ranking System[1] MHRS
Area A	Inactive	TBD[4]	A	Small	15.4	15.4
- Tanks		High	A			
Area B	Inactive	TBD	A	Medium	15.3	13.0
- Chemical Pit		Medium	A			
Area C	Inactive	TBD	A	Medium	15.3	15.3
- Chemical Pit		Medium	A			
Area G	Active LLW	TBD	A	Small	TBD	TBD
Area T	Inactive	TBD	A	Small	15.4	15.4
Area U[2]	Inactive	TBD	TBD	Small	15.4	15.4
Area V	Inactive	TBD	TBD	Small	15.3	13.0
Area W[3]	Inactive				0	0

(1) Hazard Ranking System scores are presented using both the EPA methodology (HRS) and the DOE modified approach (MHRS), which discriminates among different radioisotopes relative to their potential risk.

(2) Alpha-contaminated site.

(3) Phase I assessment determined that future actions will consist of routine monitoring activities by the Waste Management Program.

(4) TBD - To Be Determined.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.4; MHRS Migration Mode Score 15.4. Area A was scored with Areas T and U because they are on the same mesa and share a common watershed.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.2 Material Disposal Area B

Background -- Material Disposal Area B is inactive and is located south of DP Road near TA-21. With the information now available, the exact number of pits cannot be ascertained. At the east end, several small slit trenches were dug for chemical disposal. When chemical disposal was started at Area C, it was discontinued at Area B. The western portion of the site has been paved and the surface has been leased to Los Alamos County, which in turn rents parking spaces to people to store trailers, old cars, etc.

A study of the area in 1966 by the U.S. Geological Survey (USGS) indicated some possible lateral movement of water -- probably from the pit. The amount of water moving through the tuff was well below the estimated effective porosity of the tuff. Radiochemical analyses of the soil and tuff from the 13 test holes around the perimeter showed no indication of radioactive contamination. Investigations of the eastern end of the site in the late 1970's showed plant root penetration of the waste and animal intrusion.

The surface was extensively renovated in 1984. All vegetation was removed and it was divided into two areas for treatment. One treatment was adding (from the top) a 6-in. layer of topsoil followed by 18 in. of crushed tuff with 6 in. of topsoil below that. Grass plugs (sand dropseed) and rabbit brush were then planted. The other treatment, starting from the top, was to spread 6-12 in. of topsoil, 6-8 in. of crushed tuff, and 2 ft. of cobble (for a biobarrier). Grass plugs and rabbit brush were also planted in the area. The effectiveness of this new trench cap is being studies by the Environmental Studies Group.

This area is being monitored for radioactive transport under the IWMP program.

CERCLA Findings -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.3; MHRS Migration Mode Score 13.0.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.3 Material Disposal Area C

Background -- The 11.8 acre inactive Material Disposal Area C is located on the north side of Pajarito Road adjacent to TA-50. It was opened in 1948 and is composed of six pits, a chemical pit, and 107 numbered shafts. Pit disposal ended in 1964 and shaft disposal ended in 1969. Studies in the late 1970's indicated animal intrusion into the waste, and other problems. Reference 9 reports that some tritium and plutonium contamination has been detected in surrounding soils. The surface was improved in 1984 by adding soil cover (depths greater than or equal to 6 in. with average cover approximately 2 ft.), recontouring, and seeding with native grasses.

Area C is being monitored for radioactivity under IWMP.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.3; MHRS Migration Mode Score 15.3.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.4 Material Disposal Area G

Background -- Area G is located at TA-54 and is the main active radioactive solid waste burial/storage site at the Laboratory. Prior to establishing Area G, geological surveys were made by the USGS and recommendations from these surveys led to its establishment. The area has been in use since 1957 and is expected to remain active through the foreseeable future to dispose of low-level waste.

Environmental studies have been conducted at Area G since about 1970. They include extensive moisture measurements, vertical and horizontal drill holes, air sampling, surface sampling, and direct radiation measurements. Results generally indicate that tritium is diffusing slowly away from its disposal location, that there is some surface contamination, and that this surface contamination causes somewhat elevated local air concentration for ^{239}Pu. Sediment sampling stations in the vicinity of Area G indicate some transport of ^{238}Pu and ^{239}Pu surface contamination. In 1984, the maximum ^{238}Pu and ^{239}Pu concentrations were 0.73 pCi/g and 0.44 pCi/g in stream channel sediments. These values, and the tritium values, are well below any present or proposed environmental standards for these radionuclides. Asbestos wastes and materials contaminated with PCBs are still placed in Area G. For the latter, an EPA permit has been obtained. Groundwater sampling for PCBs is done by sampling springs in White Rock Canyon.

As at Area L, the Laboratory has applied for an interim-status groundwater waiver in compliance with RCRA. In response to the application, the NMEID issued a compliance order that requires the Laboratory to complete a vadose zone characterization program. To receive the waiver, the Laboratory must submit a report on the vadose zone characterization to the NMEID by March 1987 proving there is no potential for groundwater contamination.

Area G has stopped receiving RCRA chemical waste under interim status. It will continue to receive radioactive waste. Mixed waste is not being diposed of at Area G but is presently being stored at Area L. Area G has been used fo disposal of classified waste contaminated with radioactivity and is still used for that purpose. Classified mixed waste was also disposed of at Area G until November 1985. All unclassified mixed waste is presently being stored. Presently, the Laboratory is able to treat classified mixed waste to render it unclassified; however, there are potential situations in which this might not be possible. The problem has been recognized, and DOE is trying to provide a solution.

The major areas of field data collection at Area G for vadose zone monitoring are (1) determination of the physical properties of soil intrinsic permeability, moisture characteristic curve, and unsaturated hydraulic conductivity of two 125-ft. deep holes, (2) core and pore gas analyses of two 100-ft. deep holes, and

(3) moisture distribution in two 50-ft. deep holes with neutron prove and soil psychrometer installations respectively.

As required by the compliance order, a report on the preliminary assessment of the hydrologic systems was submitted to the NMEID on Mar. 31, 1986.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; however, there is not sufficient information available to calculate HRS and MHRS Migration Mode Scores.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 7.

6.2.5 Material Disposal Area T

Background -- Inactive Material Disposal Area T is a set of four absorption beds at TA-21.

Several studies have been done over the years to characterize the movement of radionuclides through the tuff. Five test holes were dug around the pits in 1953; two were through the pits and one was a 45-degree hole that angled below pit #1. Plutonium concentrations above background were found to extend 20 ft. below the surface. In 1961, a 30-ft. deep caisson was dug so that horizontal cores could be taken. It was concluded from this study that plutonium had penetrated to a depth of at least 28 ft. in the tuff beneath the pits and that penetration took place mainly along joints in the tuff. Clay-filled joints will absorb plutonium, resulting in localized areas of high plutonium concentrations. In 1967, several test holes drilled outside the pits showed no alpha, beta, or gamma contamination, but tritium was found in the effluent water.

In a study completed in 1978, four sampling holes were drilled to a depth of 100 ft. through two absorption beds. In two holes, ^{241}Am had migrated 100 ft. and ^{239}Pu to 99.5 ft. below the surface. These holes were drilled in the vicinity of the place where the waste water entered the beds. The other two holes were drilled further away from the entrance point for the waste and showed ^{241}Am and ^{239}Pu to depths of 44 and 21.5 ft., respectively.

Data starting in 1952 provide the mineral composition of the waste; prior to that date, it is unknown. The raw waste was estimated to have an organic content of 3% and the treated waste an organic content of 13%.

Area T is scheduled for surface stabilization and removal of the 158 corrugated metal pipes containing TRU waste mixed in cement.

This area is being studied for radioactive transport under the IWMP.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.4; MHRS Migration Mode Score 15.4. Area T was aggregated with Areas A and U (which share the same watershed).

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.6 Material Disposal Area U

Background -- Inactive Material Disposal Area U, located at TA-21, contains two absorbtion beds similar to those in Area T. These beds were used for the subsurface disposal of contaminated liquid wastes between 1945 and 1968. The primary radionuclide in these wastes was ^{210}Po which, with its 138-day half-life, has since decayed away. Several curies of ^{227}Ac was also discharged to these beds, principally from the effluents from a filter building that scrubbed ^{227}Ac out of the air in several process buildings at TA-21. This area is surveyed for radioactive material transport under IWMP.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.4; MHRS Migration Mode Score 15.4.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.7 Material Disposal Area V

Background -- Area V, 1 acre in size and located at TA-21, was used for the disposal of contaminated liquid waste from laundry operations from 1945 to 1961. It used three absorption beds similar to those in Area T. An estimated 3 Ci of ^{89}Sr, ^{140}Ba and ^{140}La, now decayed to undetectable levels, was discharged to these pits. Small quantities of ^{90}Sr and ^{239}Pu were also discharged to the pits (KAB 1983; EIS 1979). The pits did not always function properly; in a check of the area in 1946, "we found the seepage pits, for waste water, not functioning properly and that a large amount of contaminated water was lying above the ground in the pits," (HWD 1946). This area is being monitored under the IWMP. Surface stabilization efforts were completed in FY 1985.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 15.3; MHRS Migration Mode Score 13.0.

Planned Future Actions -- This site will be evaluated under CEARP Phase 2 to determine whether future action is warranted under CEARP Phase 3.

6.2.8 Material Disposal Area W

Background -- Area W is located at TA-35. It consists of between 500 and 650 lbs., approximately 80 gal., of sodium and NaK (a sodium-potassium alloy that was used as coolant for the LAMPRE reactor) stored in two vertical stainless steel tubes 4-in. in diameter and 120 ft. long. The stored materials contain trace amounts of fission products and ^{239}Pu. Of these fission products, all would have decayed away by now except for the ^{137}Cs. The storage tubes were placed in separate steel-cased drill holes 115 ft. deep. The portions of the stainless steel tubing extending above the surface were entombed in a concrete structure in 1979. The structure's lid can be removed and it is marked with a brass plate describing the contents.

CERCLA Finding -- Positive for FFSDIF, Preliminary Assessment, and Preliminary Site Inspection; HRS Migration Mode Score 0; MHRS Migration Mode Score 0.

Planned Future Actions -- Area W will be observed annually as part of the routine monitoring activities of the waste management program. Given the present containment and the fact that the reactive metal would react with the immediate surroundings and would not pose a threat to the surface or groundwater should the tanks leak, no further actions are planned.

7.0 CEARP LONG RANGE PLANS

The proposed schedule and milestones for CEARP activities at Los Alamos National Laboratory are shown in Figure 7.1. This represents a revision to the preliminary plans prepared in late 1984 and reflects the increased scope of site characterization (will go beyond radioactive contamination problems) and a more extensive than anticipated effort to complete a records search and employee interviews. The present schedule is subject to obtaining the requisite funds and/or resource authorizations for the particular programs and laboratory divisions involved. The Department of Energy Los Alamos Area Office will request all funds and/or authorizations to achieve the proposed CEARP schedule.

It is also emphasized that the proposed schedule is based upon the current (4/86) status of information generated by Phase I investigations. Additional Phase I work is required for approximately 147 sites which are located in at least 30 technical areas and 24 designated waste disposal areas.

As illustrated in Figure 7.1, the first three phases of CEARP are projected to extend over the next five fiscal years (FY 1987 through FY 1991). Scheduling and planning for Phase 4 remedial actions and Phase 5 compliance and verification activities cannot be completed until the requisite site and technical assessments have been performed. This is required in order to properly identify program milestones and to develop reasonable estimates for manpower expenditures and task durations. Consequently, the current schedule does not include Phase 4 or 5 CEARP functions; however, it is anticipated that elements of both will be required.

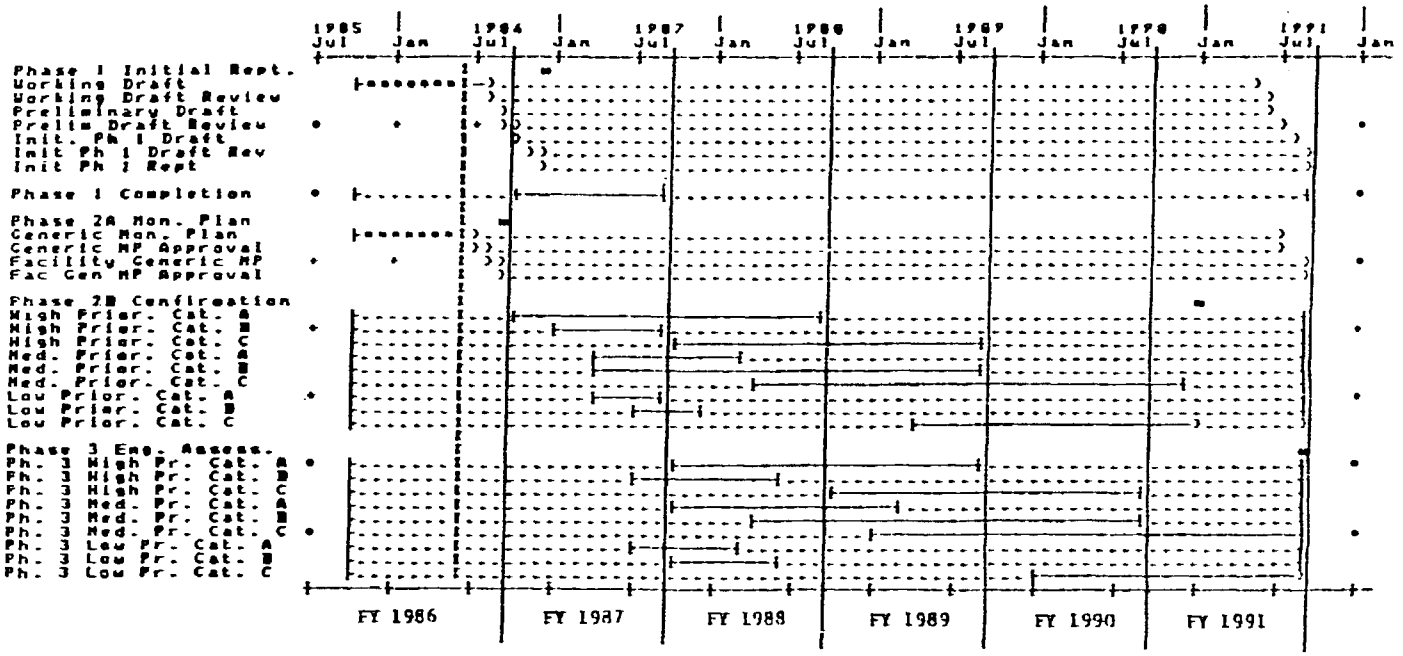
FIGURE 7.1

DRAFT PROPOSED PLAN

LOS ALAMOS NATIONAL LABORATORY

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT AND RESPONSE PROGRAM

THROUGH PHASE 3



The proposed schedule is broken into five major program activities:

- o Phase 1 Initial Report
- o Phase 1 Completion
- o Phase 2A Monitoring Plan
- o Phase 2B Confirmation Actions
- o Phase 3 Engineering Assessment

The first major activity reflects the expectations for completion of the Initial Phase 1 CEARP report. The Initial Phase 1 report is in its final stages of preparation and will soon be proceeding through the internal Laboratory and DOE review and approval process. The report is anticipated to be ready for release outside DOE during the first quarter of CY 1987. The report will be a status report of the Phase 1 investigations as of early 1986. This will include discussion of the 128 sites identified for Phase 2 and 3 activities and identification of the 147 sites for which Phase 1 activities will continue.

The second section of Figure 7.1 indicates the Phase 1 completion effort. This is presently expected to occupy all of FY 1987 and will represent approximately 5 to 7 man years of effort. During that Phase 1 completion effort, it can be anticipated that additional sites will be determined to need Phase 2 and/or 3 followup work.

The third section of Figure 7.1 identifies the preparation of the CEARP Phase 2A Generic Monitoring Plan for Los Alamos.

The fourth section of Figure 7.1 indicates the proposed timing of CEARP Phase 2 Activities for the various combinations of priority and category groups. The sequencing of the activities is intended to address the most important known problems first, develop information on uncertain potentially important problems next, and finally, develop information on all remaining possible problems.

The fifth section of Figure 7.1 indicates the proposed timing of the CEARP Phase 3 activities for the various combinations of priority and category groups. The rationale for sequencing activities is the same as for Phase 2. The Phase 3 activities are expected to be started well before the completion of Phase 2 for

any given site. Phase 3 of necessity extends significantly beyond the end of Phase 2 because of the interdependency of information. Additionally, in at least some cases where remedial actions may be required, Phase 3 is intended to cover a significant series of interactions with appropriate agencies outside DOE and will include satisfying any National Environmental Policy Act requirements.

3.0 NATIONAL ENVIRONMENTAL POLICY (NEPA) STRATEGY

3.1 NEPA Activities

Los Alamos National Laboratory has prepared a site environmental impact statement which was completed in December, 1979 (Ref. 10). The study addressed site waste management activities and impacts; however, it did not include a discussion of specific actions and facilities to process and ship retrievably stored TRU waste to the Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico, nor does it reflect current CEARP activities.

In December 1984, DOE issued the Defense TRU Waste Program NEPA Strategy and Planning Document (TLO-85/7). This report focused on DOE-managed TRU waste storage and generator site plans and NEPA requirements for the retrieval, processing and certification, and shipment of stored defense TRU wastes for emplacement at WIPP. It provided a basis for coordinating site NEPA actions to meet system-wide environmental analyses and documentation requirements under NEPA and the DOE Environmental Compliance Guide for stored TRU waste. It does not address buried TRU waste sites.

Proposed NEPA milestones for Los Alamos National Laboratory included preparation of an integrated action description memo (ADM) on site TRU facilities by September, 1985. This schedule was met with a draft ADM report which described the proposed action and its location and discussed any known potential environmental issues or problems. As provided by the NEPA process, DOE concluded that a more in-depth analysis of potential environmental impacts should be performed and that an environmental assessment (EA) should be performed. Los Alamos National Laboratory has prepared a draft EA for its TRU Work-Off Plan which is currently under DOE Headquarters review.

8.2 NEPA/CERCLA Relationship

Many elements of CERCLA remedial planning for buried waste are also integral to NEPA - evaluation of alternatives, analysis of environmental impacts, and public involvement. Consequently, steps to coordinate the environmental requirements under CERCLA and NEPA need to be taken.

Section 6.2 of the CEARP Plan indicates that remedial actions taken pursuant to CERCLA (Sections 104 and 106) are generally exempt from NEPA, based on numerous court decisions holding that the EPA carries out the functional equivalent of a NEPA review in its permitting and regulatory activities. This makes it imperative that CEARP Phase 3 activities closely follow EPA guidance under CERCLA to accomplish the functional equivalent of NEPA.

CEARP directs that the following steps should be implemented as appropriate to help ensure that proposed remedial actions achieve the functional equivalent of NEPA:

1. The process for determining the extent of the remedy required by CERCLA Section 105(3) and described in Section 300.68 of the NCP will be followed. This process includes the necessary and appropriate investigation and analysis of environmental factors as they specifically relate to a site, and alternatives that are being considered to correct the situation.

2. A meaningful opportunity for public comment on environmental issues will be provided before the final selection of a remedial alternative. To meet this requirement, DOE will allow both the opportunity and adequate time for the public to review the Technological Assessment. This should be accomplished as part of the community relations program, which will be established by each installation.

The focus of CEARP is broader than that of CERCLA (e.g., RCRA continuing release sites and activities under the DOE Surplus Facilities Management Program, which may not have to be addressed under criteria established for implementing CERCLA remedial activities). Therefore, implementation of programs designed to meet the functional equivalent of NEPA and comply with NEPA (e.g., the DOE-equivalent of a memo-to-file for clearly insignificant

activities, an environmental assessment, an environmental impact statement for more significant actions) will be established on a site-by-site basis. CEARP NEPA-related documentation and documentation for other environmental requirements (e.g., floodplain/wetland involvement) will be consistent with the guidance provided in DOE Order 5440.1C and AL Order 5440.1B (Implementation of the National Environmental Policy Act) and the DOE Environmental Compliance Guide.

9.0 SCHEDULE FOR BURIED TRU WASTE CEARP ACTIVITIES

9.1 Proposed Schedule

Los Alamos National Laboratory CEARP goals and milestones have been projected for a five-year period extending through FY 1991. As emphasized previously, the program has been defined only through the Phase 3 Engineering Assessment, since subsequent remedial actions and compliance/verification activities are dependent on the predecessor phase findings. Estimated schedules for buried TRU waste sites are presented and discussed within this context.

Identified task durations represent the time frame that major activities for the task will be accomplished. However, due to the parallel phases of the program and the inherent nature of the investigations and studies, all tasks are anticipated to involve some level of on-going effort through FY 1991. This will permit incorporation of new or revised findings as assessment and confirmation work progresses.

As indicated in Section 7.0, the major portion of CEARP Phase I installation assessment activities will not be completed until the end of FY 1987. A subtask of this effort will be to identify buried TRU wastes which may pose a risk to health, safety, and the environment. While a preliminary assessment has been made on all currently identified buried TRU waste sites, substantial effort remains, with the exception of Material Disposal Area W. Federal Facility Site Discovery and Identification findings for this particular site are positive; however, it received a zero HRS/MHRS migration mode score. It is proposed that Area W will be observed annually as part of routine monitoring activities of the Waste Management Program.

Phase 2A monitoring plan activities to perform preliminary studies to define the effort required to complete Phase I recommendations are closely following Phase I work. The monitoring plan is intended to provide a description of the current situation as well as define four supporting plans which comply with EPA guidance on remedial investigations under CERCLA - Sampling, Technical Data Management, Health and Safety, and Quality Assurance/Quality Control. The DOE Albuquerque Operations Office (AL) has proposed a three-tiered approach to accomplish this:

- A CEARP Generic Monitoring Plan (CGMP) to cover aspects of the plan pertinent to all AL installations and provides guidance for preparing

- An Installation Generic Monitoring Plan (IGMP) which addresses environmental issues relevant to a given AL facility, and

- Site-Specific Monitoring Plans (SSMP) which cover aspects of the monitoring plan that pertain to a specific waste site or grouping of waste sites at an AL installation.

The CGMP is defined in the CEARP, which is in a working draft stage, and is being utilized by Los Alamos to develop and implement its IGMP. Completion of the IGMP and supporting SSMP's will closely follow the end date for Phase I tasks.

Phase 2B Site Confirmation Characterization Studies and subsequent Phase 3 Technological Assessments will closely parallel each other. Initial Confirmation Activities have commenced and are projected to continue through CY 1990. Technological assessment work is projected to start in July, 1987, and extends to the end of FY 1991. Initiation of specific waste site activities will be based upon the site CEARP priority, and within each priority grouping, will be determined by the RCRA category (see Section 6.1).

The two waste tanks in Disposal Area A have been assigned a high CEARP priority. The chemical disposal trenches in Area B and the chemical pit in Area C have been given a medium priority. The CEARP priority for the

remaining portions of these disposal areas as well as for Area G, T, U, and V remain to be determined.

Material Disposal Area A, B, C, G, and T have been designated as RCRA Category A sites. The RCRA category for Areas U and V will be determined as Phase I activities continue.

9.2 Schedule Uncertainties

There are several factors which could impact the proposed CEARP schedule and related plans for buried TRU waste management. Several of these have been discussed in the preceding sections and have the potential of delaying projected start dates or extending task durations. Included are:

- Uncertainties in projecting Phase I resource needs to complete an extensive records review to identify site hazardous substances.
- Impacts from additional findings as Phase I activities progress to the completion stage.
- Approval of funding and resource allocations within the context of overall DOE priorities at other installations and under other federal regulations.

References

1. Ltr J.A. Detamore to Distribution, 9/10/86, RF 86-2883, "Buried Waste Implementation Plan".

2. Enclosure 27 to NOD response: "Information Supporting CEARP" (with attachments).

3. CEARP Phase 2: Generic Monitoring Plan (working draft), 7/86.

4. CEARP Phase 3: Technological Assessment Plan (working draft), 8/86.

5. DOE Order 5480.14, "CERCLA Program", 4/26/85.

6. "History and Environmental Setting of LASL Near Surface Land Disposal Facilities for Radioactive Wastes" (LA-6848-MS, 5/77).

7. "Alternative Transuranic Waste Management Strategies at Los Alamos National Laboratory", LA-8982-MS, 9/81.

8. Phase 1 CERCLA report (still in internal review: release not expected until January '87).

9. "Los Alamos Low-Level Waste Performance Assessment Status", LA-10768-MS, 6/86.

10. "Final Environmental Impact Statement, Los Alamos Scientific Laboratory Site", DOE/EIS-0018, 12/79.