

# Los Alamos

Los Alamos National Laboratory  
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## Memorandum

TO: S.V. Jackson, S-4, MS F611

THRU: L. C. Borduin, H-7, MS E518  
Approved by  
L. C. Borduin

FROM: John L. Warren, H-7

SUBJECT: DOE HAZARDOUS MIXED WASTE TECHNOLOGY PROGRAM

DATE: April 25, 1983

MAIL STOP/TELEPHONE: E516/7-5397

Deadline
Recall
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In response to a request from S-4, the following information was gathered as part of the DOE Hazardous Waste Technology Program. The hazardous chemical wastes and mixed wastes that are either stored, treated, or disposed of at Los Alamos National Laboratory are characterized in this document and on the attached tables.

To avoid duplication, a description of the facilities and sites employed in waste handling activities is provided in this text rather than on the tables provided by S-4. The description of the waste follows, with many of the chemicals listed generically rather than specifically (e.g., acid waste rather than nitric acid).

Eight facilities were used during FY82 for waste management activities. Of these, one is for storage, four are used for treatment, and three are disposal sites.

The storage facility is used for the accumulation of PCB contaminated items and oil that will be disposed of at an approved PCB incineration facility. Building 61 at TA-21 is dedicated for this purpose and meets the requirements of Annex III of the February 17, 1980 Federal Register (PCB Disposal and Marking) for PCB storage facilities. A temporary, curbed, asphalt holding pad behind Building 61 serves as a storage area for oil awaiting analytical results for PCB contamination level.

Cyanide, chromate, and acid/base wastes are treated in a small batch plant at TA-50. The system consists of a vented 150 gallon treatment tank with gas and caustic supply lines. The current plant is being replaced to allow treatment of larger volume and more complex waste streams. Anticipated start-up date for this new plant is early 1984.



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Two plants are used for the treatment of radioactive liquid waste. The TA-50-1 facility provides a bar screen, grit chamber, raw waste storage tanks, flash mixers, chemical feeders, flocculator-clarifiers, gravity filters, distributor for CO<sub>2</sub>, ion-exchange columns, spent regenerant storage/treatment tank, sludge storage tanks, vacuum filter, and treated waste storage tanks. Chemicals used for separation and concentration of alpha-emitting radionuclides include ferric sulphate, lime, trisodium phosphate, and coagulant aids. The sludge produced by chemical treatment is dewatered by vacuum filtration to 25-40% solids, placed in lined 215-L (57-gal) steel drums if the transuranium radionuclide activity is >100 nCi/g, and forwarded to TA-54 (Area G) for retrievable, 20 year storage. The sludge in the drums looks like wet clay, but no free water is apparent. To further assure the absence of free water, about 10 pounds of Portland cement powder is placed in the bottom of the drum liner before the sludge is added, and another 10 pounds of cement is placed on top of the sludge after the drum is filled.

The second facility, TA-21-257, provides a bar screen, grit chamber, raw waste storage, flash mixer, chemical feeders, flocculator, sedimentation tank, filter sump, recarbonators, pressure filter, and treated waste storage tanks for treatment of low-level radioactive wastes. Other concrete and stainless steel storage tanks are provided for a variety of higher level batch wastes. Most of these are treated by neutralization, if necessary, in special stainless steel watercooled tanks. Neutralized and alkaline wastes are transferred to a mixer-equipped feed tank, then fed to a pug mill where cement from a silo is added. Nonretrievable cement paste is discharged to large shafts in Area T, a disposal site west of the building. The system was modified in late FY 1975 to provide for storage of the paste requiring retrievability in 6.1-m (20-ft)-long by 0.76-m (2.5-ft)-diameter galvanized, welded, corrugated-metal pipe (CMP) sections. Sludge from the chemical treatment plant providing feed to the pug mill system does not require retrievability; it is discharged to asphalt-lined shafts in the tuff in Area T. Appropriate samples are taken at all phases of the operations.

Waste high explosives are collected, packaged, stored, and periodically burned at the S-Site burning ground. Accumulations of waste in sumps are collected in a special truck, taken to filter beds at the S-Site burning ground, dried, and burned. Combustible oils and solvents, paper, and wood contaminated with high explosives are collected and burned in an incinerator at S-Site or in a burn pit at TA-40.

As mentioned, three sites receive hazardous chemical waste for disposal. Area T, as described above, is used only for disposal of cement paste waste. The second site is TA-54, Area G. This area is situated on Mesita del Buey in TA-54 and is the main active radioactive solid waste burial/storage site at the Laboratory. The area has been used since 1957 and is expected to remain active through the foreseeable future. In FY 1977, the active portion of the site was expanded to a current total area of  $2.55 \times 10^5 \text{ m}^2$  (63 acres); future expansion of this area is planned. Burial/storage facilities within the area include pits, shafts, trenches, and pads of varying dimensions. A more detailed description of the use of these facilities and of current waste management operations is contained in the LASL Final Environmental Impact Statement.

Certain "nonreactive" hazardous chemical wastes have been buried in pits and shafts along with radioactive wastes at Area G. Such wastes include asbestos, beryllium residues, empty pesticide containers, PCB-contaminated solids [transformers, capacitors, solids (before 1978)], and solid trash-type wastes contaminated with known or suspected carcinogens. Between 1976 and 1979 much of this waste was buried in a separate pit (Pit 19) at the site, although there were exceptions due to very large volumes (e.g., PCB-contaminated transformers). In 1980, approval was granted by the EPA for disposal of PCB-solid waste in special facilities at Area G.

All mixed waste is either stored or buried at this site. For safety reasons, the majority of buried waste is placed in shafts for greater isolation from intrusion. For example, coyotes would create an intrusion concern when digging up and eating biological wastes if it were buried in the pit rather than in the shaft.

Area L,  $3.6 \times 10^3 \text{ m}^2$  (0.88 acre), is located on Mesita del Buey in TA-54, and since 1964, has been the main active chemical waste disposal site at Los Alamos. From 1964 through May 1975, all chemical wastes were disposed of in one pit at the site. Beginning in June 1975, with the transfer of responsibility for disposal operations to the Waste Management Group, this pit was covered and shafts were used for waste chemical disposal.

Chemical disposal shafts measure 0.6 m (2 ft) to 2.4 m (8 ft) in diameter by up to 20 m (65 ft) deep. Different shafts are used for different categories of waste chemical (e.g., organics, inorganics, oils, etc.) to assure that incompatible chemicals will not mix and react. In addition, one small pit at the site is used for disposal of bulk quantities of treated aqueous waste. The water quickly evaporates from these wastes leaving a "salt cake" in the pit bottom. When this salt cake is within 1 m (3 ft) of the top of the pit, backfill is applied. One such small pit in the area was filled between June 1975 and July 1978.

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At the present time, the chemical waste records system at Los Alamos is a hand written, hand sorted system. A computer data base is currently being written to replace this system. As a result, most current data is recorded in generic terms rather than specific terms (e.g., organic rather than trichloroethane). Therefore, most of the chemicals reported on the attached forms will be described in generic terminology. An exception to this will be made when a significant volume of a specific waste was disposed of. All reported generation rates are for FY82 operations.

A copy of the 1982 Waste Management Site Plan is enclosed for additional reference. If there are any questions about the information provided in this text, the forms or the Site Plan, please contact Karen Balo, H-7, at 7-5397.

KAB/mec

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