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Los Alamos National Laboratory

Transuranic Waste Facility Permit Modification Request

Revision 0.0

Prepared by:

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Water Quality & RCRA Group
Environmental Protection Division
Los Alamos, New Mexico 87545

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Nuclear Facility
Permit Modification Request

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF SUPPLEMENTS

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	Environmental Protection Agency
ft.	foot/feet
gal.	gallon(s)
HEPA	high-efficiency particulate air
HVAC	heating, ventilating, and air conditioning
L	liter
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
MLLW	mixed low-level waste
MTRUW	mixed transuranic waste
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
RCRA	Resource Conservation and Recovery Act
SWMU	Solid Waste Management Unit
T&E	threatened and endangered
TA	technical area
TRU	transuranic
TRUWF	Transuranic Waste Facility
USFWS	U.S. Fish and Wildlife Service
WIPP	Waste Isolation Pilot Plant

1.0 INTRODUCTION

This document is a Class 3 permit modification request for the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit. This permit modification package presents information to address the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised October 1, 2003 [10-01-03], specific to hazardous and mixed waste operations to be located at the LANL Technical Area (TA) 52 Transuranic Waste Facility (TRUWF). Additional information is provided in this permit modification request that exceeds regulatory standards required to satisfy Resource Conservation and Recovery Act (RCRA) as well as 20.4.1 NMAC compliance. This additional information is not intended for inclusion in LANL's hazardous waste facility permit.

This permit modification request and LANL permit renewal documents state that a unit to be permitted may also be referred to as a facility. The term "facility," as it appears in this context, is used only to denote building or area names and does not imply the regulatory meaning of "facility" as defined in 20.4.1 NMAC §260.1 [10-1-03]. However, pursuant to 20.4.1 NMAC §260.1 [10-01-03], the LANL facility as a whole does meet the regulatory definition of a facility. Table 1-1 provides a list of regulatory references and the corresponding location in this permit modification package, as appropriate. Where applicable, regulatory citations in this document reference 20.4.1 NMAC, which adopts, with a few exceptions, all of the Code of Federal Regulations (CFR), Title 40, Parts 260 to 266, Part 268, and Part 270.

LANL must retain a viable capability and support facility dedicated to characterize, store, manage and ultimately ship off-site for disposal transuranic (TRU) waste. TRU waste streams will be shipped to and disposed of at the Waste Isolation Pilot Plant (WIPP). The TRUWF will have the capability of the following functions for waste:

- Staging & Storage - sealed waste packages (e.g., drums and solid waste boxes) will be received from waste generators and waste materials will be staged pending certification and shipping.
- Characterization & Certification - sealed waste packages will undergo quantitative and visual examinations to determine and certify that they satisfy TRUWF and WIPP or other off-site treatment, storage, and disposal facility (TSDF) waste acceptance requirements.
- Packaging, Treatment, Size Reduction, and Decontamination – on an as needed basis, waste packages will be opened and contents will be resorted, treated, repackaged, size reduced, and/or decontaminated to satisfy WIPP or other TSDF criteria.

- Shipping, Receiving and Transport Operations – TRU Waste Package Transporter (TRUPACT) II and other waste containers (e.g., drums or standard waste boxes) will be prepared and loaded into waste trucks and will depart for the off-site TSDF.

Waste acceptance criteria and characterization changes made to the WIPP permit or other off-site TSDF may impact program requirements.

LANL requests a Class 3 permit modification to include this waste management unit within the LANL Hazardous Waste Facility Permit in accordance with 20.4.1 NMAC § 270.42(c)[10-1-03].

Table 1-1
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§270.14(b)(1)	General facility description	Appendix A
§270.14(b)(2)	Chemical and physical analyses of hazardous waste	Appendix B[a]
§270.14(b)(3)	Waste analysis plan	Appendix B[a]
§264.13(b)	Development and implementation of a written waste analysis plan	Appendix B[a]
§264.13(c)	Off-site waste analysis requirements	Appendix B[a]
§270.14(b)(4)	Security procedures and equipment	Appendix G
§264.14	Security procedures and equipment	Appendix G
§270.14(b)(5)	General inspection schedule	Appendix C[a]
§264.15(b)	General inspection schedule	Appendix C[a]
§264.174	Inspections/containers	Appendix C[a]
§264.195	Overfill control inspections	NA
§264.226	Surface impoundment monitoring and inspection	NA
§264.254	Waste pile monitoring and inspection	NA
§264.273	Land treatment and operating requirements	NA
§264.303	Landfill monitoring and inspection	NA
§264.1033	Process vent standards	NA
§264.1052	Equipment leak air emission standards	NA
§264.1053	Compressor standards	NA
§264.1058	Standards for pumps, valves, pressure relief devices, flanges, and connections	NA
§270.14(b)(6)	Request for waiver from preparedness and prevention requirements of 264 Subpart C	NA

Table 1-1 (continued)
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§264.30-37	Preparedness and prevention: applicability, design and operation, required equipment, testing and maintenance of equipment, access to communications or alarm systems, required aisle space, and arrangements with local authorities	Section 2 and Appendices C[a], E[a], G[a]
§264.227	Surface impoundment emergency repairs	NA
§270.14(b)(7)	Contingency Plan	Appendix E[a]
§264.50-56	Contingency plan and emergency procedures: applicability, purpose/implementation of contingency plan, content of contingency plan, copies of contingency plan, amendment to contingency, emergency coordinator, and emergency procedures	Appendix E[a]
§270.14(b)(8)	Description of preparedness and prevention	Appendix G
§270.14(b)(8)(i)	Hazard prevention in unloading operations	Appendix G
§270.14(b)(8)(ii)	Runoff prevention	Appendix G
§270.14(b)(8)(iii)	Contamination prevention of water supplies	Appendix G
§270.14(b)(8)(iv)	Mitigation of equipment failure and power outages	Appendix G
§270.14(b)(8)(v)	Prevention of undue exposure of personnel to hazardous waste	Appendix G
§270.14(b)(8)(vi)	Prevention of releases to the atmosphere	Appendix G
270.14(b)(9)	Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes	Section 2 and Appendix G
§264.17	Procedures to prevent accidental ignition, reaction of ignitables, reaction of reactives, reaction of incompatibles, and documentation of compliance with 264.17 (general requirements for ignitable, reactive, or incompatible wastes)	Section 2 and Appendix G

Table 1-1 (continued)
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
270.14(b)(10)	Traffic pattern: volume, controls, and access	Appendix A[a]
264.18(a)	Seismic considerations (NOTE GT: Align)	Appendix A[a]
§270.14(b)(11)	Facility/unit identification and location information	Appendix A
§270.14(b)(11)(i)	Seismic standard applicability [264.18(a)]	Appendix A
§270.14(b)(11)(ii)	Seismic standard requirements	Appendix A
§270.14(b)(11)(ii)(A)	No fault within 3,000 feet (ft) with displacement in Holocene time	Appendix A, Supplement A.1
§270.14(b)(11)(ii)(B)	If faults which have displacement in Holocene time are present within 3,000 ft, no faults pass within 200 ft of portions of the facility where treatment, storage, or disposal will be conducted	Supplement A.1
§270.14(b)(11)(iii)	100-year floodplain standard	Appendix A[a]
§270.14(b)(11)(iv)(A-C)	Facilities located within the 100-year floodplain	NA
§270.14(b)(11)(v)	Compliance schedule for 264.18(b)	NA
§270.14(b)(12)	Personnel training program	Appendix D
§270.14(b)(13)	Closure and post-closure plans	Appendix F and Supplements F.1 and F.2
§264, Subpart G	Closure and post-closure	Appendix F and Supplements F.1 and F.2
§264.178	Closure/containers	Appendix F and Supplements F.1 and F.2
§264.197	Closure and post-closure care/tanks	NA
§264.228	Surface impoundments	NA

Table 1-1 (continued)
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§264.258	Waste piles	NA
§264.280	Land treatment	NA
§264.310	Landfills	NA
§264.351	Incinerators	NA
§264.603	Requirements by the Secretary	NA
§270.14(b)(14)	Deed restrictions/post-closure notices (264.119)	NA
§270.14(b)(15)	Closure cost estimate (264.142)	Appendix F
§270.14(b)(16)	Post-closure cost estimate (264.144)	Appendix F
§270.14(b)(17)	Liability insurance (264.147)	Appendix F
§270.14(b)(18)	Proof of financial coverage (264.149-150)	Appendix F
§270.14(b)(19)	Topographic map requirements	Appendix A[b]
§270.14(b)(19)(i)	Map scale and date	Appendix A[b]
§270.14(b)(19)(ii)	100-year floodplain area	Appendix A[b]
§270.14(b)(19)(iii)	Surface waters	Appendix A
§270.14(b)(19)(iv)	Surrounding land uses	Appendix A
§270.14(b)(19)(v)	Wind rose	Appendix A
§270.14(b)(19)(vi)	Map orientation	Appendix A[b]
§270.14(b)(19)(vii)	Legal boundaries	Appendix A[b]
§270.14(b)(19)(viii)	Access control	Appendices A and G
§270.14(b)(19)(ix)	Wells	Appendix A
§270.14(b)(19)(x)	Buildings	Appendix A
§270.14(b)(19)(xi)	Drainage barriers or flood control	Appendix A

Table 1-1 (continued)
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§270.14(b)(19)(xii)	Location of operational units	Appendix A
§270.3(b)(20)	Other federal laws	3.0
§270.3(a)	Wild and Scenic Rivers Act	3.0
§270.3(b)	National Historic Preservation Act	3.0
§270.3(c)	Endangered Species Act	3.0
§270.3(d)	Coastal Zone Management	3.0
§270.3(e)	Fish and Wildlife Coordination Act	3.0
§270.3(f)	Executive Orders	3.0
§270.14(b)(21)	Notice of extension approval for land disposal facilities	NA
§270.14(c)	Groundwater monitoring requirements	Appendix A[a]
§270.14(c)(3)	Topographic map with points of compliance	NA
§270.14(c)(3)	Proposed location of groundwater monitoring wells	NA
§270.14(c)(4)	Description of plume of contamination that has entered the groundwater from a regulated unit at the time the application was submitted	NA
§270.14(c)(4)(i)	Extent of plume indicated on topographic map	NA
§270.14(c)(4)(ii)	Identification of constituents and concentration	NA
§270.14(c)(5)	Detailed plan and engineering report describing proposed groundwater monitoring program	Appendix A[a]
§270.14(c)(6)	If no release detected at date of submitted, then submit following	Appendix A[a]
§270.14(c)(6)(i)	List of proposed indicator parameters, waste constituents, and reaction products	NA

Table 1-1 (continued)
Regulatory References and Corresponding Permit Modification Request Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification Request
§270.14(c)(16)(ii)	Proposed groundwater monitoring system	NA
§270.14(c)(16)(iii)	Background values for each proposed monitoring parameter	NA
§270.14(c)(16)(iv)	Description of proposed sampling, analysis, and statistic comparisons to be used	NA
§270.14(c)(7)	If a release is detected at the point of compliance, then corrective actions	NA
§270.14(d)	Information requirements for solid waste management units (SWMU)	4.0 and Supplement 4.1
§270.14(d)(1)(i)	Location of SWMUs on topographic map	4.0 and Supplement 4.1
§270.14(d)(1)(ii)	Types of SWMUs	4.0 and Supplement 4.1
§270.14(d)(1)(iii)	Dimensions and descriptions of SWMUs	4.0 and Supplement 4.1
§270.14(d)(1)(iv)	Dates of SWMU operations	4.0 and Supplement 4.1
§270.14(d)(1)(v)	Waste types managed at SWMUs	4.0 and Supplement 4.1
§270.14(d)(2)	Information on releases from SWMUs	4.0 and Supplement 4.1
§270.14(d)(3)	RCRA Facility Assessment sampling and analysis results	NA
§270.15	Information requirements for containers	Appendix G

[a] Requirement or information is also addressed in the most recent version of the "Los Alamos National Laboratory General Part B Permit Application," as appropriate.

[b] Some of the topographic map requirements are addressed in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application," as appropriate.

2.0 WASTE MANAGEMENT UNIT

The waste management unit described in this Transuranic Waste Facility (TRUWF) permit modification request will be located at Technical Area (TA) 52, in the central portion of the Los Alamos National Laboratory (LANL) as shown in Appendix A on Figure A-2. The TRUWF will consist of one waste management unit that will provide storage and treatment in containers for hazardous wastes, including the hazardous component of mixed transuranic (MTRUW) and mixed low-level (MLLW) waste streams. The information provided in this section is submitted to address the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1(20.4.1 NMAC), Subpart IX, § 270.15, and 20.4.1 NMAC 4.1, Subpart V, Part 264, Subpart I, revised October 1, 2003[10-01-03].

This section presents general descriptions of the proposed waste management unit and waste management practices. The structure number for the waste management unit will be TA-52, Building 190. The location of the unit is shown in Appendix A of this permit modification submittal on Figure A-2. The general storage area layout is shown on Figure A-3. The facility will be surrounded with an 8-foot (ft) security fence. Access to the facility will be controlled by badge readers and administrative controls. Detailed information for and additional figures of the proposed waste management unit at TA-52 and the waste management practices associated with the TRUWF are provided in Appendix G of this permit modification request package. A summary of applicable regulatory references and the corresponding location where the requirement is addressed in this permit modification request is located in Table 1-1. Table G-1 summarizes specific applicable regulatory references for container storage and the corresponding location where the requirement is addressed in this document.

2.1 CONTAINER STORAGE/TREATMENT UNIT

The maximum storage capacity of the TRUWF will be 105,875 gallons, or the equivalent of 1,925 55-gallon drums. The TRUWF will be used to store mostly newly generated MTRUW in solid form. Waste containers with potential liquids and other types of mixed or non-mixed hazardous waste may also be managed at the TRUWF (e.g., MLLW or hazardous waste), either as residuals from the preparation of MTRUW for transport and disposition at off-site disposal facilities or routinely if LANL waste management policies are revised in the future and capacity exists at this facility. Waste containers will be stored within the building in several designated areas, in waste transport trucks, or in TRU waste characterization trailers. The TRUWF will be made up of four general areas: the main staging and storage area; the characterization and certification area; the size reduction, decontamination, and repackaging area; and the shipping and receiving area. Figure 2-1 displays a representation of the proposed maximum storage capacity for the TRUWF. This maximum storage capacity is based on the proposed storage configuration within the designated storage areas. No medical, infectious, or explosive wastes will be accepted at the TRUWF. Proposed general dimensions, containment features, and materials of construction for the TRUWF are described in Appendix G of this permit modification submittal to satisfy the requirements of 20.4.1 NMAC § 270.15(a)(1) and (2) [10-01-03].

2.2 TREATMENT IN CONTAINERS

Waste received and stored in containers at the TRUWF may need further treatment to meet the waste acceptance criteria for transport and disposition at off-site facilities. Treatment methods that will be used at the TRUWF may include absorption, neutralization, cementing or grouting, and puncturing of aerosol cans. The most common treatment method that is anticipated is absorption of liquids. These methods of treatment will be conducted at the TRUWF within waste containers and may be performed individually and in conjunction with each other to treat the waste in the most effective manner to meet off-site waste acceptance criteria. When more than one treatment will be performed on a waste, individual operations, as outlined below, may be combined. Treated waste may be consolidated with other treated waste provided that the wastes are compatible. These treatment processes may also be conducted during waste repackaging and/or resizing operations. All treatment will be conducted with the use of a glove bag, tent, and/or in the building's modular panelized containment system. Heating, ventilating, and air conditioning (HVAC)/ high-efficiency particulate air (HEPA) equipment will be used as necessary for containment purposes. Treatment operations associated with the containers may include:

- Transferring liquids into containers with absorbent;
- Adding absorbent into containers with liquids;
- Use of cement as an absorbent;
- Neutralizing liquids in containers;
- Simultaneous absorption and neutralization of liquids by adding a neutralizing absorbent to containers (either prior to or after the liquid is added);
- Transferring liquids from containers followed by neutralization and then absorption or cementation;
- Absorption followed by transferring excess liquid into containers and further absorption or cementation;
- Puncturing of aerosol cans found in waste containers and placement of the punctured can back into the original container or in a new waste container;
- Cementing or grouting liquids or sludge by mixing and binding it with an inert cementitious material;

- Adding absorbent into a container or secondary containment device prior to can puncturing to absorb any liquid that may be released.
- Commingling of compatible liquids after can puncturing or prior to neutralization, cementation, and/or absorption; and
- Commingling of compatible absorbed liquids.

The methods of proposed treatment to be conducted at the TRUWF are further described in Appendix G of this permit modification submittal.

2.3 STORAGE CONTAINERS

A variety of containers may be used for storage at the TRUWF including 0.25, 0.5, 0.75, 1, 2, 4, and 6 liter (L)/quart containers; 5-, 14-, 30-, 55-, 85-, and 110-gallon steel, polyethylene, and fiber drums; FRP boxes; steel SWBs; various steel boxes; ten drum overpacks (TDOP); metal overpack boxes; roll-off bins; cardboard shipping containers; labpacks; gas cylinders; and some oversized custom metal and wooden containers. Additional information for proposed typical storage containers that will be utilized at the TRUWF is provided in Tables 2-1 and 2-2. These tables do not contain information for all of the possible containers that may be used for future waste management activities. Each container is identified in the tables without limiting the association of size and material. All waste containers that will be stored at the TRUWF will be stored on pallets or are otherwise elevated (e.g., metal supports, wooden timbers, in structures elevated by design) to prevent contact with accumulated liquids, which meets the requirements in 20.4.1 NMAC § 264.175(b)(2) [10-01-03]. Information regarding the presence of free liquids in containers of hazardous waste is obtained through generator waste-characterization knowledge, visual examinations, real-time radiography (RTR), and/or the Paint Filter Liquids Test. Waste containers bearing free liquids are stored with secondary containment, by design or with pallets, and are kept from contact with any potentially accumulated liquids in accordance with 20 NMAC 4.1, Subpart V, 264.175(b)(2) [10-01-03].

2.4 MINIMUM AISLE SPACE AND STORAGE CONFIGURATION

Waste containers at the TRUWF will be arranged in rows with a minimum aisle space of 24 inches (in.). Storage configuration within a row will depend upon the type of container, its size, and its weight restrictions. Waste containers equal to or greater than 55 gallons (drums, FRP boxes, SWBs, and metal overpack boxes) will be arranged in rows and stacked to a maximum of three high unless they are too large or heavy to be supported by the container(s) to be located underneath and/or maneuvered with available forklift/crane/hoist. This stacking configuration is based upon the Code of Federal Regulations (CFR) requirements in 49 CFR 178.606(c), "Performance-Oriented Stack Test" which requires a minimum testing height of ten feet for demonstrating container integrity. For MTRUW and MLLW, the stacking limit is also based on a criticality assessment, which shows that there is not a criticality concern for these containers in an infinite array stacked three high. All other types of containers less than 55 gallons will be arranged in rows and will be stacked to a maximum of 10 feet (ft) high. Figure 2-1 illustrates a storage configuration that reflects the maximum storage at the TRUWF; however, storage operations are dynamic and the storage configuration is subject to change based on daily operations.

2.5 AUTHORIZED WASTE

The TRUWF will be used to store hazardous waste containers bearing one or more of the U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers presented in the revision to the "Los Alamos National Laboratory General Part A Permit Application, Revision 5.1" included with this permit modification submittal.

2.6 CONDITION OF CONTAINERS [20.4.1 NMAC §264.171]

Any container at the TRUWF that is not in good condition either during or prior to storage (e.g., severe rusting, apparent structural defects, leaking (dewatering etc.) will be over packed or the wastes will undergo repackaging in containers that are in structurally sound condition. Containers shall not exhibit severe rust, dents, deep scratches, bulges, leaks or other structural defects. Any waste container that is not in good condition (e.g., severe rusting, apparent structural defects. leaks) will be over packed, or repackaged in a container that is in good condition and is compatible with the waste materials, packaging materials, and/or other container. Over packed and/or new containers must also be compatible with and resistant to environmental conditions. This meets the requirements of 20.4.1 NMAC §264.171 [10-01-03].

Suppliers of waste container components are audited by LANL for qualification prior to conducting business transactions. LANL also uses approved procurement product specifications that include quality assurance requirements and ensure that container package specifications meet U.S. Department of Transportation (DOT) (49 CFR 173.410) requirements for Type A/7A packages.

Containers procured by LANL include liners if required for the container to meet the manufacturer's specifications for Type A/7A compliance. When liners are procured individually, a representative sample of the purchased liners will be inspected for compliance with appropriate specifications using an approved inspection procedure. Containers that do not pass inspection are segregated and marked from those that are acceptable to prevent inadvertent use.

2.7 COMPATIBILITY OF WASTE WITH CONTAINERS [20.4.1 NMAC §264.172]

The TRUWF will only store containers made of or lined with materials that will not react with and are otherwise compatible with the wastes stored in them. Prior to filling the container with waste, all container components (e.g., lid, liner, and interior/exterior surface) are inspected to ensure container integrity as well as compatibility with the type of waste to be placed into the container. Compatibility of the waste container, including liners, and the waste to be containerized is required and ensured by the facility. Information regarding the liner's compatibility with the waste components can be obtained from the container/liner manufacturer. This fulfills the requirements of 20.4.1 NMAC §264.172 [10-01-03].

2.8 MANAGEMENT OF CONTAINERS [20.4.1 NMAC §264.173(a) and (b)]

Waste containers that will be stored at the TRUWF will be handled in a manner that will not cause them to rupture or leak, as required in 20.4.1 NMAC §264.173(b) [10-01-03]. All containers will be kept closed during storage in accordance with 20.4.1 NMAC §264.173(a) [10-01-03], except when waste is added to or removed from the container, when a container's contents need to be repackaged, or during treatment. In addition to the containers being closed, the closing devices will be secured in a manner that provides no visible holes, gaps, or other open spaces into the interior of the container, in accordance with 20.4.1 NMAC §264.1086(c)(1)(iii)[10-01-03].

The TRUWF will be constructed with a ventilation system that will to monitor air pressure and ambient air for personnel working in areas where hazardous or mixed waste will be managed. It will create zones within the TRUWF that are at a lower pressure than the outside air (negative pressure) to prevent the movement of contaminants from the building. Air will flow from the zones of highest pressure to those of lowest pressure (i.e., highest potential contamination areas). The airflow through the different zones will be carefully balanced, controlled and monitored to provide the greatest protection to personnel as well as to the environment. If negative air pressure exceeds designed limits, a ventilation alarm will be activated. Detailed information on general facility operations and container management practices are contained in Appendix G of this permit modification submittal.

2.8.1 Packaging and Over packing

Waste packaging/repackaging activities will be conducted at the TRUWF container storage/treatment unit. This includes the addition of waste received from generators into secondary containers or movement of waste from one secondary container to another. Some wastes may be received as small waste items that will be packed into secondary containers to maximize storage and shipping efficiency. Other wastes will be received as large waste items that require packaging into a shipping container.

Over packing will occur at the TRUWF when a primary container fails to provide adequate containment. The over pack container will then be considered the primary container.

2.8.2 Labeling

Each container of hazardous waste will be labeled with a "Hazardous Waste" label bearing the following information:

- Generator name and address
- EPA Identification Number
- The accumulation start date
- The applicable EPA Hazardous Waste Number(s)

A "Radioactive Material/Radioactive Waste" label will be applied, if appropriate. LANL will follow all applicable U.S. Department of Energy (DOE) and Nuclear Regulatory Commission (NRC) procedures, requirements and guidelines as they apply to storage, treatment, and radioactive decontamination of the TRUWF waste management units. The DOE and NRC regulations are not preempted by federal or state regulations governing the handling of hazardous waste. Compliance with all available DOE and NRC requirements is protective of human health and the environment.

2.8.3 Transportation of Containers

Flatbed trucks, trailers, and/or forklifts may be used to transport waste containers to and from the waste management units at the TRUWF. Forklift operations may use a boom, if necessary, to improve handling capabilities. Small containers may be handled manually or with a dolly. The use of proper handling equipment, appropriate to a container's size and weight will mitigate hazards while moving containers.

2.9 CONTAINMENT SYSTEMS [20.4.1 NMAC §270.15(A)(1-5) AND 270.15(B)(1-2)]

In accordance with 20.4.1 NMAC §270.15(b)(1) [10-01-03], information contained in LANL's waste databases or waste characterization records can be used initially to verify the absence of free liquids in containers. In addition to records, visual examination can be used to verify the absence of free liquids. Potential liquids that might accumulate at the TRUWF container storage/treatment unit are contained within containment systems (e.g., self-containment pallets) at each storage location until the liquid is removed. All secondary containment systems will be designed to contain at least 10 percent of the volume of potential liquid-bearing containers or the volume of the largest container, whichever is greater, pursuant to the requirements of 20.4.1 NMAC §264.175(b)(3) [10-01-03]. Secondary containment will not be engineered into the final facility design; however, secondary containment systems will be used to ensure the safe storage and management of liquid bearing waste containers.

Concrete floors within the main storage building and the concrete containment building (where treatment, repackaging, and resizing will occur) will be sealed with an epoxy or similar protective coating to aid in decontamination should a spill occur.

Any accumulated liquids will be removed in a timely manner to prevent overflow of the containment system. The collected liquids will then be transferred to appropriate containers and sampled, as necessary. The facility will have floor drains and sumps to handle and contain leaks, as well as retain liquids for sampling and appropriate disposal, should they occur. If the accumulated liquids are from an identifiable source, or from water generated during fire-suppression activities, the resulting material may be characterized as a newly-generated waste and analyzed for constituents known to be components of the source. If the accumulated liquids are from other than an identifiable source, the resulting material will be analyzed for the appropriate potential parameters listed in Appendix E of this submittal. Containers of collected liquids will be stored with secondary containment, pending analytical results, which will determine how the waste liquids will be managed. This method of removal and analysis of accumulated liquids fulfills the requirements of 20.4.1 NMAC §270.15(a)(5) [6-14-00], for prevention of overflow.

2.10 INSPECTION SCHEDULES AND PROCEDURES

Inspections will be used to identify leaking containers, deterioration of containers, and/or loss of integrity of the containment system, as required by 20.4.1 NMAC §264.174 [10-01-03]. The inspections will include checking the structural integrity of the containers (e.g., for bulging or warping). Inspections will follow the Inspection Plan in Appendix C of this permit modification submittal. Inspections of the containers while they are in storage will be used to verify that there are no visible holes, gaps, or other open spaces into the interior of containers while they are in storage.

All containers will be regularly inspected for evidence (e.g., corrosion, visible staining, bulges, rupture, dents, and leaks) that may indicate surface contamination. If any evidence of surface contamination from a breach of container integrity is detected, the waste container will either be over packed in an appropriate container or repackaged in a new container as discussed in Section 2.7.1.

2.10.1 Special Requirements for Ignitable, Reactive, and Incompatible Wastes [20.4.1 NMAC §264.17 and 20.4.1 NMAC §§270.15(c) and 270.15(d)]

Pursuant to 20.4.1 NMAC §264.17 [10-01-03], LANL will adhere to the following specific waste management procedures for ignitable and reactive waste. Containers with ignitable or reactive wastes will be located at least 50 ft from the LANL property line (Figure A-2) at all times and will be protected from sources of ignition or reaction. Waste management practices at the TRUWF will minimize the possibility of accidental ignition. No sources of open flames or spark producing equipment will be allowed at the TRUWF container storage/treatment unit, and smoking will be prohibited. Cutting and welding activities will never be conducted in the vicinity of waste containers without proper controls, only non-sparking tools will be used to handle ignitable waste containers, and lightning rods will be located on all storage structures. "No Smoking" signs will be conspicuously placed at the facility wherever there is a potential hazard from ignitable or reactive waste.

Precautions will be taken to prevent reactions that may produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment or produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions. These precautions will include keeping containers closed during storage and venting containers of mixed transuranic waste. Together, these measures meet the requirements of 20.4.1 NMAC §§264.17(a) and (b) and 264.176[10-01-03].

Incompatible wastes will be separated and segregated from other wastes and materials by means of berm, dike, wall, or other specific means (e.g., secondary containment pallets, cabinets, distance). Incompatible waste will also be stored at the TRUWF separately in accordance with the following DOT compatibility groups:

- Flammables (Class 3)
- Oxidizers (Class 5.1)
- Combustible/Noncombustible Miscellaneous Hazardous Material (Class 9)
- Corrosives (Class 8)
- Poisons (Class 6)
- Radioactive (Class 7)
- Acids (Class 8)
- Reactive (Class 4)
- Non-regulated materials.

In addition, no incompatible wastes will be mixed, and no waste will be placed in a container that previously held an incompatible waste, as required by 20.4.1 NMAC §264.177(a) and (b), and 20.4.1 NMAC §270.15(d).

2.11 CLOSURE

Closure will consist of partial closure of the hazardous waste management unit at the TRUWF while leaving the other hazardous and mixed waste management units at LANL in service. Partial closure activities will be accomplished by removal of hazardous wastes and residues from the surfaces and/or equipment associated with the unit to be closed and that may have come into contact with the waste. Detailed closure procedures for the TRUWF are addressed in Appendix F of this permit modification submittal. This information is provided to meet the requirements of 20.4.1 NMAC §§264.111 and 264.178 [10-01-03].

2.12 CONTROL OF RUN-ON/RUNOFF

Controlling run-on and run-off at the TRUWF locations where waste management operations will regularly occur is accomplished by the design of the building and the use of control structures with appropriate contouring of surface areas. Run-on of storm water into the indoor container storage areas at the TRUWF will not occur due to the building enclosure and surface contouring along the perimeter of the building to prevent impoundment of water against the foundations, doors, and loading areas. The outdoor storage area on the southwestern portion of the building will be sloped away from the building to direct potential run-on away. Storm drains and trenches will be included in the building design as necessary to collect any precipitation or snowmelt that may enter the building through the loading/unloading area.

Run-on from off-site and storm water run-off at the building will be collected by a perimeter system including ditches and culverts. The system will direct storm water around the site and to the north. Run-off from the outside storage area on the southwest side of the building will be collected by a central drain. The drain will be piped to a storm water sampling system prior to being directed to the perimeter drainage system (See Figure A-9 of Appendix A of this document).

Liquids that may result from fire suppression related activities within the building will be collected in the fire water tank on the east side of the building. The tank will be sized to accommodate standard fire collection volumes for the facility as specified by applicable National Fire Protection Association (NFPA) and U. S. Department of Energy standards. All stored waste containers in the building will be elevated to provide protection from liquids that could be introduced through fire-suppression activities. Liquids resulting from fire suppression activities outside the building will follow the external drainage collection system (drains, perimeter drainage ditches, and culverts) toward the north side of the area. Fire suppression overflow from the outside storage area will be directed as discussed above for storm water.

Further details regarding run-off from waste management activities at this facility are included in Appendix G. Design details of these features may be subject to change. This information is provided to meet the requirements of 20.4.1 NMAC §264.175(b)(4), and 20.4.1 NMAC §270.14(b)(8)(ii) [10-01-03].

Table 2-1

Proposed Typical Storage Containers for Hazardous and Mixed Waste

Container Type	Description	Requirements
Non-Bulk Performance-Oriented Packaging [a]	Steel drums	• 49 CFR §178.504. • Maximum capacity not to exceed 119 gal.
	Aluminum drums	• 49 CFR §178.505. • Maximum capacity will not exceed 119 gal.
	Metal drums other than steel or aluminum	• 49 CFR §178.506. • Maximum capacity will not exceed 119 gal.
	Fiber drums	• 49 CFR §178.508. • Maximum capacity will not exceed 119 gal.
	Plastic drums	• 49 CFR §178.509. • Maximum capacity will not exceed 119 gal.
	Plastic Jerricans	• 49 CFR §178.509. • Maximum capacity will not exceed 16 gal.
	Steel or aluminum boxes	• 49 CFR §178.512.
	Aluminum or steel Jerricans	• 49 CFR §178.511. • Maximum capacity will not exceed 16 gal.
	Plywood boxes	• 49 CFR §178.514.
	Fiberboard boxes	• 49 CFR §178.516.
	Composite packaging with inner receptacles	• 49 CFR §178.522. • Maximum capacity will not exceed 66 gallons.
	Composite packaging with inner glass, porcelain, or stone receptacles	• 49 CFR §178.523.
Intermediate Bulk Performance-Oriented Packaging [b]	Metal intermediate bulk containers	• 49 CFR §178.705.
	Rigid plastic intermediate bulk containers	• 49 CFR §178.706.
	Composite intermediate bulk containers	• 49 CFR §178.707.
	Fiberboard intermediate bulk containers	• 49 CFR §178.708.
	Wooden intermediate bulk containers	• 49 CFR §178.709.
	Flexible intermediate bulk containers	• 49 CFR §178.710.
Cylinders [c]	Seamless steel cylinders	• DOT Specification 3A, 3AX, 3AA, 3AAX, 3B, 3E, or 3T in 49 CFR, Part 178, Subpart C.
	Welded or brazed steel cylinders	• DOT Specification 4B, 4BA, 4B240ET, 4AA480, 4L, or 4BW in 49 CFR, Part 178, Subpart C.
	Seamless or welded aluminum cylinders	• DOT Specification 3AL or 4E in 49 CFR, Part 178, Subpart C.
	Seamless nickel cylinders	• DOT Specification 3BN in 49 CFR, Part 178, Subpart C.
Containers Used for Transport of Radioactive Materials	DOT Containers	• DOT Specification 7A in 49 CFR §178.350.
	IP Containers	• Industrial Packaging IP-1, IP-2, or IP-3 in 49 CFR §173.411.
	Exceptions	• 49 CFR §173.410.

a Manufacturer has provided the required UN marking in accordance with 49 CFR §178.503.
b Marked by the manufacturer in accordance with 49 CFR §178.703.
c Marked with the applicable DOT specification number in accordance with 49 CFR §178.35.

CFR = Code of Federal Regulations
DOT = U.S. Department of Transportation
IP = Industrial Packaging
gal = gallons
lbs = pounds

Table 2-2

Proposed Storage Containers for Mixed Transuranic Waste

Container Type	Description	Requirements	Filter Vents [a]
Standard 55-gallon Drum	• Gross internal volume of 7.3 ft^3 (0.21 m^3). • Constructed of mild steel. • May also contain ridge, molded polyethylene (or other compatible material) liner.	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Standard Waste Box	Gross internal volume of 66 ft^3 (1.88 m^3).	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Standard 85-gallon Drum Over Pack	• Gross internal volume of 11.3 ft^3 (0.32 m^3). • Used for over packing contaminated 55-gallon drums.	Not Applicable	One or more filter vents installed on top of the container.
100-gallon (379-liter) Drum	• gross internal volume of 13.4 ft^3 (0.38m^3). • May be direct loaded with contact-handled transuranic mixed waste	Meet the requirements for DOT Specification 7A in 49 CFR §178.350.	One or more filter vents installed on top of the container.
Ten Drum Overpack	• Gross internal volume of 160 ft^3 (4.5 m^3). • Used to contain up to ten standard 55-gallon drums or one standard waste box	DOT Specification 7A and is certified to meet applicable requirements for Type A packaging	One or more filter vents installed on top of the container.
Oversized Waste Box	• Gross internal volume greater than 11.3 ft^3 (0.32 m^3). • Used for oversized waste.	Not Applicable	Two or more filter vents installed on sides of container.
Remote-handled Transuranic Canister	• gross internal volume of 31.4 ft^3 (0.89 m^3) • Used for waste packaged in small containers (e.g., 55-gallon drums) or waste loaded directly into the canister.	Not Applicable	Vented

a Vents are high-efficiency particulate air grade filters to preclude container pressurization caused by gas generation and to prevent particulate material from escaping. Vents have an orifice approximately 0.375 inches (9.53 millimeters [mm]) in diameter through which internally generated gas may pass. Filter media can be any material compatible with the contents of the container (e.g., composite carbon, sintered metal).

CFR = Code of Federal Regulations
DOT = U.S. Department of Transportation
ft^3 = cubic feet
m^3 = cubic meters

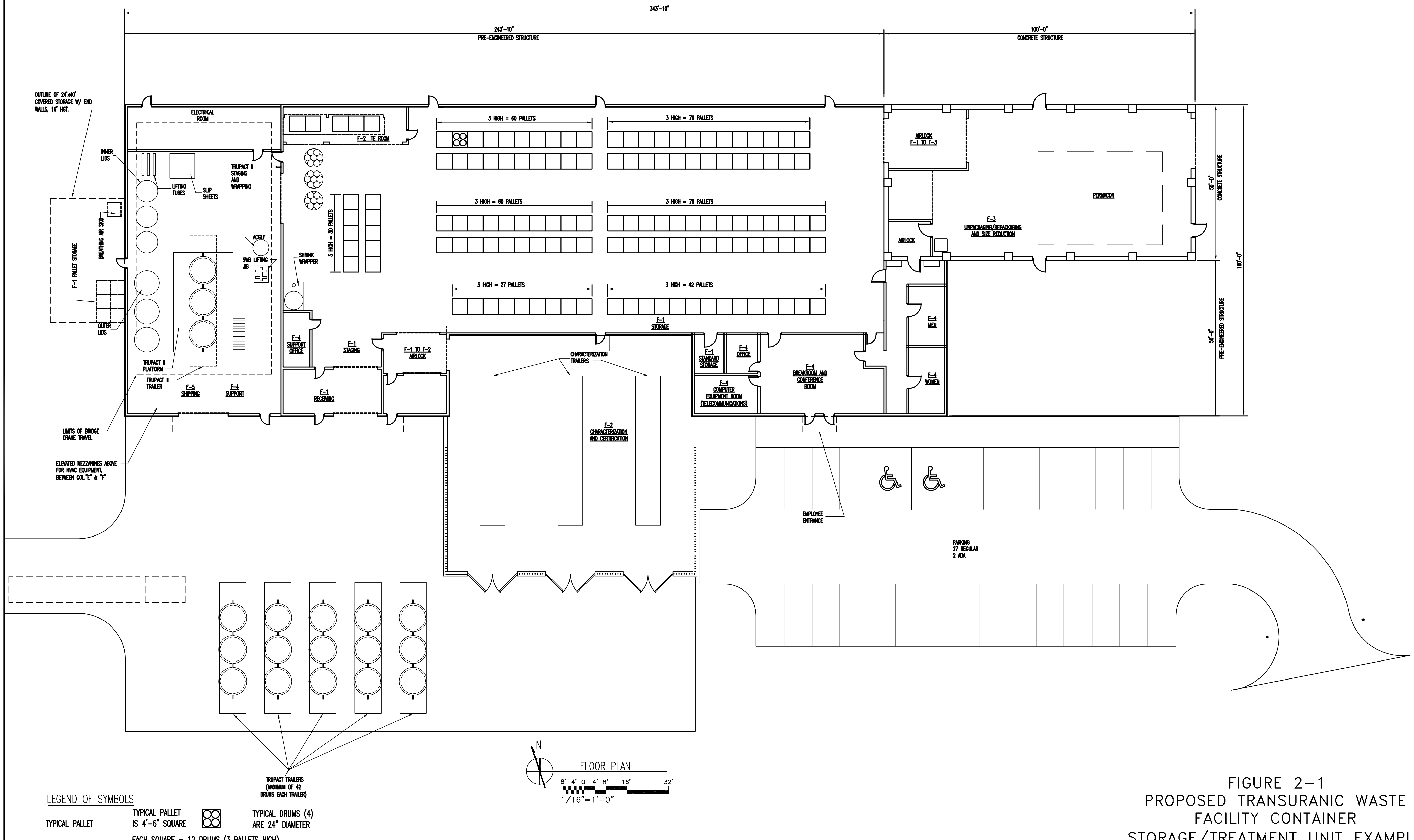

FIGURE 2-1
PROPOSED TRANSURANIC WASTE FACILITY CONTAINER STORAGE/TREATMENT UNIT EXAMPLE CONFIGURATION AND CAPACITY

3.0 OTHER FEDERAL LAWS

The following federal laws are required under the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), §§ 270.3 and 270.14(b)(20), revised October 1, 2003 [10-01-03], to be given consideration when applying for a hazardous waste facility permit. When any of these laws is applicable, its procedures must be followed:

1. *The Wild and Scenic Rivers Act (16 United States Code [USC] 1273 et seq.)*. This act provides for a national wild and scenic rivers system and prohibits construction of any waterway that would have a direct adverse effect on the values for which a wild and scenic river was established.

2. *The National Historic Preservation Act of 1966 (16 USC 470 et seq.)*. This act establishes a program for the preservation of historic properties throughout the country. The act has provisions that require mitigation of adverse effects to registered properties.

3. *The Endangered Species Act of 1973 (16 USC 1531)*. This act provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The act prohibits any action that would jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.

4. *The Coastal Zone Management Act of 1972 (16 USC 1451 et seq.)*. This act establishes national policy for the management, use, protection, and development of land and water resources of the nation's coastal zones. Section 307(c) of the act and implementing regulations prohibit the U.S. Environmental Protection Agency from issuing a permit for activity affecting coastal zone land or water without the certification from the applicant that the activity is in compliance with the state Coastal Zone Management Program.

5. *The Fish and Wildlife Coordination Act of 1934, as amended (16 USC 661 et seq.)*. This act promotes the conservation of wildlife, fish, and game and integrates this conservation with water resource projects. Certain provisions of the act require that permits proposing or authorizing the impoundment, diversion, or other control or modification of any body of water be considered by the appropriate state agency for impacts to wildlife resources.

Because Los Alamos National Laboratory (LANL) has ongoing programs in support of the National Historic Preservation Act, the Endangered Species Act, and the Fish and Wildlife Coordination Act, consideration was given to these federal laws.

The National Historic Preservation Act is administered by the Advisory Council on Historic Preservation, appointed by the President, and the New Mexico State Historic Preservation Office. Section 106 of the Act requires the U.S. Department of Energy (DOE) to consider the effects of its actions on historic properties and provide the Council with a reasonable opportunity to comment on those actions and the manner in which DOE considers historic properties in their decisions. DOE accomplishes this through consultation with the State Historic Preservation Office whenever a project may potentially impact a historic property. LANL may prepare a Historic Building Survey Report assessing the eligibility of a historic building dating from the Manhattan Project and early Cold War periods (1943 to 1956) for the National Register of Historic Places and evaluating the impacts of the proposed actions. The consultation process was formalized in April 2000 through a Programmatic Agreement between DOE, the Council, and the State.

For any undertaking on DOE land that may directly or indirectly impact threatened and endangered (T&E) species or their habitat, DOE must consult with the U.S. Fish and Wildlife Service (USFWS), as provided under Section 7 of the Endangered Species Act. Similarly, DOE must consult with the USFWS for projects that would impound, divert, or otherwise control or modify a body of water, as required by the Fish and Wildlife Coordination Act. For Endangered Species Act compliance, LANL may prepare a Biological Assessment to document the presence of T&E species and to evaluate the impacts of a project on a listed species or its habitat. DOE will then request in writing that the USFWS concurs with DOE's findings in the Biological Assessment. In recent years, DOE and LANL have streamlined the consultation process by preparing a T&E Species Habitat Management Plan. This plan fulfills the provisions of the Endangered Species Act that requires federal agencies to implement programs for the conservation of T&E species and their habitat. The USFWS approved this plan in February 1999.

Provisions in the Wild and Scenic Rivers Act and the Coastal Zone Management Act are not applicable to LANL's activities. Consideration will be given to Executive Orders, issued by the President, that are relevant to waste management activities at LANL. When any of these Orders is applicable, its provisions will be fully followed. Requirements for Executive Orders are reserved in 20.4.1 NMAC § 270.3(f) [10-01-03].

4.0 CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

The information provided in this section is submitted to address the requirements for solid waste management units (SWMU) in accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 §270.14(d), revised October 1, 2003 [10-01-03]. This section provides the SWMUs identified for the Transuranic Waste Facility (TRUWF) to be located at Technical Area (TA) 52 at the Los Alamos National Laboratory (LANL).

LANL uses the definition of a SWMU presented in the LANL Compliance Order on Consent (Consent Order) signed by the U.S. Department of Energy, the University of California, and the New Mexico Environment Department on March 1, 2005, hereinafter referred to as the Consent Order. This definition states that SWMUs are "any discernible unit at which solid waste has been placed at any time, and from which the Department determines there may be a risk of release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility at which solid wastes have been routinely and systematically released; they do not include one-time spills."

Table 4-1 lists the SWMUs at TA-52 and at TA-4, which historically overlapped a portion of TA-52. Supplement 4-1, which has been extracted from the 2006 “Solid Waste Management Unit and Area of Concern Report” (LANL, 2006) provides descriptions of the SWMUs listed in Table 4-1. These descriptions include, to the extent available, the unit type, general dimensions and structural descriptions, the dates of operation, and the waste managed at the unit. Supplement 4-1 also includes the most current information available pertaining to releases of hazardous wastes or hazardous constituents from the units and results of sampling analyses conducted to date. In addition, the location of each SWMU is presented on topographic maps included with Supplement 4-1.

Table 4-1
Solid Waste Management Units Identified at Technical Areas 4 and 52

SWMU No./Former SWMU No.	Consolidated SWMU No.	Location	Description	Status
04-001	04-001-99	Site of former TA-4 within TA-52	Firing Pit	Consolidated
04-002			Disposal Site	
04-003(b)			Drain line and outfall	
04-003(a)	04-003(a)-00	Former Alpha Site – former building 04-7	Outfall and drain lines from former building 04-7	Consolidated
04-004			Building footprint of 04-7	
52-001(d)		Inside building 52-1	Contaminated equipment	Inactive
52-002(a)		North of building 52-1	Septic system	Active
52-003(a)		Former building 52-2	Former waste neutralization and pumping facility	Inactive

SWMU = Solid Waste Management Unit
TA = technical area

Supplement 4.1

Solid Waste Management Units at Technical Areas 4 and 52
[Information Extracted from the 2006 “Solid Waste Management Unit and Area of Concern Report”,
LA-UR-06-2183]

TA-04, Alpha Site

TA-04, called Alpha Site, was used as a firing site; use was discontinued in the late 1940s. The TA was decontaminated and decommissioned in 1985. The former site of TA-04 lies within the current boundaries of TA-63 and TA-52. The location of the SWMUs addressed in this section are within the current boundaries of TA-52.

The site of former TA-04 is located on a small finger mesa that extends eastward from the main Pajarito Mesa. The mesa is bounded on the north by Ten Site Canyon, which branches west from Mortandad Canyon, and on the south by Cañada del Buey.

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Consolidated Unit 04-001-99 — Firing Site

Technical Area	TA-04	**Has ER Sampled the Site?**	Yes
Dates of Operation	1945-1946	**ER Remedial Action Conducted?**	No
Former Operable Unit	OU 1129	**Other Remedial Action Conducted?**	Yes
Structure Number	N/A	**Aggregate Area (reporting)**	Middle Mortandad/ Ten Site Canyon

Unit Description

Consolidated unit 04-001-99 consists of SWMUs 04-001, 04-002, and 04-003(b), an inactive firing pit and its associated surface disposal site, and the drainline and outfall from a control building. Former TA-04, known as Alpha Site, lies within the current boundaries of TA-63 and TA-52. Alpha Site is located on Mesita del Buey, a small finger mesa that extends east from the main Pajarito Mesa. It is bounded on the north by Ten Site Canyon and on the south by Cañada del Buey. Alpha Site was established in 1944 as a test firing site for small charges. It was used for implosion studies using the "electric" method of detonation wave determination. Maximum charges fired were 200 lb. Other documented studies at Alpha Site included smaller tests of the "pin shot" and "magnetic" methods of studying implosions and "equation of state" experiments. The use of Alpha Site was discontinued in 1946, and the site underwent D&D in 1985 as part of the LASCP.

SWMU 04-001 is a former 10-square-ft firing pit that was built in 1945. The pit contained conduit and firing lines. Debris in the vicinity of the firing pit included wire and shrapnel. The energy source for the firing experiments was HE, and shot sizes ranged from 0.5 to 200 lb of this material. The pit was cleaned of all debris, backfilled, and contoured in 1985 during the LASCP cleanup effort. Wastes were disposed of at TA-54. The ground surface has been scraped clear of vegetation and topsoil. No radioactive or surface soil contamination was detected during the cleanup, which did not address nonradioactive contamination. LANL conducted a radiation survey at the site in 1988. At that time, beta-gamma activity was found to be above background. One surface-soil sample was collected at SWMU 04-001 in 1991. The sample was screened for HE residues and analyzed for TCLP metals, total beryllium, total uranium, and organic chemicals. Gross-alpha, -beta, and -gamma activity was at background level. All inorganic chemicals were below EPA guidelines. Total beryllium and uranium were determined to be at background levels. No HE or other organic chemicals were detected.

SWMU 04-002 is the 20-ft-wide canyon-side disposal site associated with 04-001. The site is located on the north-facing slope of Mortandad Canyon immediately north of SWMU 04-001. After a shot, residual material from the firing site was bulldozed over the edge of the canyon to the area designated as the surface disposal site. The shot debris consisted of cables, wires, and possibly small amounts of uranium, beryllium, lead, aluminum, and HE. The material was not covered, and this site was not addressed during the 1985 LASCP.

SWMU 04-003(b) is the former drainline and outfall from a laboratory control building (Building 04-3), located at former TA-04. The outfall discharged about 20 ft north of Building 04-3 into Mortandad Canyon. No radioactivity was detected in a 1953 survey, and the building was demolished and partially removed in 1956. The concrete storm drain, electrical conduit, wood and other surface debris, and the drainpipe were removed during the 1985 LASCP cleanup effort. During the LASCP cleanup, a portable radiation monitor was used, and no radioactive contamination was detected. In a 1988 survey, gamma radiation was detected at nearly twice the background level. The site has not been investigated for nonradioactive contamination. Potential contaminants are not known.

ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SSL/SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. Activities conducted at this site are described in detail in the documents listed in the reference section below.

ER Project RFI activities were performed at these SWMUs in 1994 and 1995. Approximately 42 samples were collected and analyzed for radioactivity, gamma spectroscopy, alpha spectroscopy, inorganic chemicals, and HE. Engineering surveys of SWMUs 04-001, 04-002, and 04-003(b) were performed according to the SAP. The location of the former TA-04 firing pit, SWMU 04-001, was established using aerial photographs of the site. Two boreholes were drilled to 20 ft deep to collect discrete soil samples at 5-ft intervals. Four of the surface samples were relocated to possible shrapnel sites in the vicinity of the former firing pit to collect potentially contaminated soil. At SWMU 04-002, engineering surveys revealed a dozer trench leading from the site of the former firing pit to the edge of the mesa. A pile of debris is located at the edge of the mesa and has potentially migrated over the edge of the mesa. The SAP was amended to collect additional samples of potentially contaminated soil at SWMU 04-002. The outfall trench from former structure 04-3 at SWMU 04-003(b) was located near the former firing pit site during the engineering surveys. Sample locations were revised as a result of the engineering surveys. Because HE is a potential contaminant of concern at this consolidated unit, HE was added to the analytical suite for all samples. Forty-two samples were collected and submitted to an off-site analytical laboratory for analysis of organic chemicals, inorganic chemicals, and radionuclides. Three inorganic chemicals were detected above BVs. Eleven radionuclides were detected above BVs/FVs.

Following the Cerro Grande fire of 2000, LANL's Water Quality and Hydrology group, in conjunction with NMED and DOE, determined that this consolidated unit needed erosion control measures to be installed because the area had been affected by the fire. Straw wattles were installed above the site to divert run-on, at the mesa's edge within the north-facing drainage and on the lower bench for sediment retention. Spot hand raking, reseeding, and straw mulch also were applied. Within one year after the fire, the site was in good condition, with a vegetative cover of approximately 50%. The area was stable, with minimal evidence of sediment migration.

In 2004, the ER Project sampled this consolidated unit to address additional data needs identified following 1994 and 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

ER Project Sampling Summary

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
HEs	—	N/A	—
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	✓
SVOCs	—	N/A	—
VOCs	✓	N/A	—

The following table provides the analytes that exceeded FY2004 SSL/SALs.

Analytical Suite	Analyte	FY2004 SSL/SAL (Residential)
Radionuclides	Uranium-234	63 pCi/g
	Uranium-238	86 pCi/g

References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate LA-UR Number: 04-1714

Addendum to RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

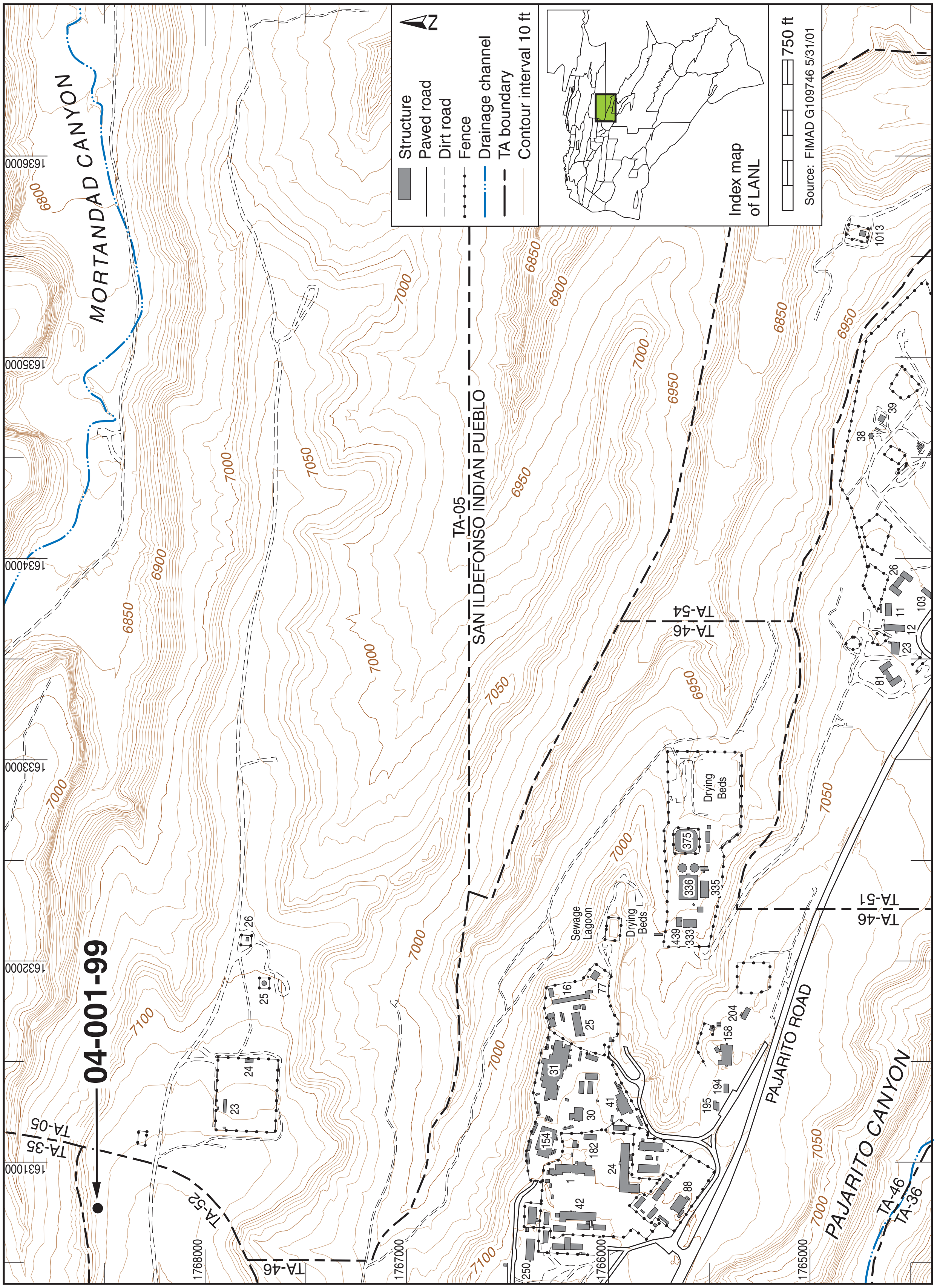
RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

Solid Waste Management Units Report, Volume I of IV (TA-0 through TA-9) LA-UR Number: 90-3400

After Cerro Grande fire [SWMU 04-003(b)]

View of SWMU 04-001

View of SWMU 04-002


Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
750 ft
Source: FIMAD G109746 5/31/01
MORTANDAD CANYON
TA-05
SAN ILDEFONSO INDIAN PUEBLO
04-001-99
TA-35
TA-05
TA-52
TA-46
TA-54
TA-46
TA-51
TA-46
TA-36
Sewage Lagoon
Drying Beds
Drying Beds
PAJARITO ROAD
PAJARITO CANYON

Consolidated Unit 04-003(a)-00 — Alpha Site Photo Processing Building, Drainlines, and Outfall

Technical Area	TA-04	**Has ER Sampled the Site?**	Yes
Dates of Operation	1945-1946	**ER Remedial Action Conducted?**	No
Former Operable Unit	OU 1129	**Other Remedial Action Conducted?**	Yes
Structure Number	04-7	**Aggregate Area (reporting)**	Middle Mortandad/ Ten Site Canyon

Unit Description

Consolidated unit 04-003(a)-00 consists of SWMU 04-003(a) and AOC 04-004. Former TA-04, known as Alpha Site, lies within the current boundaries of TA-63 and TA-52. Alpha Site is located on Mesita del Buey, a small finger mesa that extends east from the main Pajarito Mesa. It is bounded on the north by Ten Site Canyon and on the south by Cañada del Buey. Alpha Site was established in 1944 as a test firing site for small charges and was used as a firing site for implosion studies using the "electric" method of detonation wave determination. Maximum charges fired were 200 lb. Other documented studies at Alpha Site included smaller tests of the "pin shot" and "magnetic" methods of studying implosions and "equation of state" experiments. Alpha Site underwent D&D in 1985 as part of the LASCP.

SWMU 04-003(a) consists of the outfall from a photo processing laboratory (Building 04-7) and any associated drainlines that may still remain in place. The outfall discharged on the south side of the building to a trench that led to the head of Cañada del Buey. Portions of the probable path of the outfall have since been covered by two buildings (structures 52-114 and -115) and an asphalt parking lot. Beta activity was detected in the darkroom in 1953, and portions of the floor were removed in an attempt to remediate the contamination. The outfall was not removed when the building was dismantled in 1956, and it is not known if the drainlines remain or were removed. Potential contaminants at this SWMU are photo processing chemicals and uranium.

AOC 04-004 is the building footprint of a photo processing laboratory (Building 04-7), where film was reportedly developed from approximately 1948 to 1955. The structures have been removed but potential soil contamination may remain in the vicinity of the building footprint. Potential contaminants are photo processing chemicals and uranium.

ER Project Activities

Activities conducted at this site are described in detail in the documents listed in the reference section below.

RFI activities were performed at SWMU 04-003(a) and AOC 04-004 in 1994 and 1995. Thirty-one soil samples were collected from 10 sample locations, 15 from AOC 04-004 and 16 from SWMU 04-003(a). Samples were submitted for radionuclide, inorganic and organic chemicals analyses. Twenty-nine additional surface and subsurface samples were collected in 1998 to fill in data gaps and to provide information on the potential for HE contamination. These samples were submitted for inorganic and organic chemical analysis and HE. Contaminants detected at concentrations above BV in the sampling set included arsenic, chromium, and lead. Approximately 10 organic chemicals were also detected. Of those chemicals detected, only arsenic, thallium, and benzo(a)pyrene were present at concentrations exceeding screening levels.

ER Project Sampling Summary

The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Note: The BV for arsenic is higher than its SSL. Therefore, arsenic may be above its SSL, but not necessarily above its BV.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
HEs	—	N/A	—
Inorganic chemicals	✓	✓	✓
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	—	N/A	—

The following table provides the analytes that exceeded FY2004 SSL/SALs.

Analytical Suite	Analyte	FY2004 SSL/SAL (Residential)
Inorganic chemicals	Arsenic	3.9 mg/kg
	Thallium	5.16 mg/kg

References

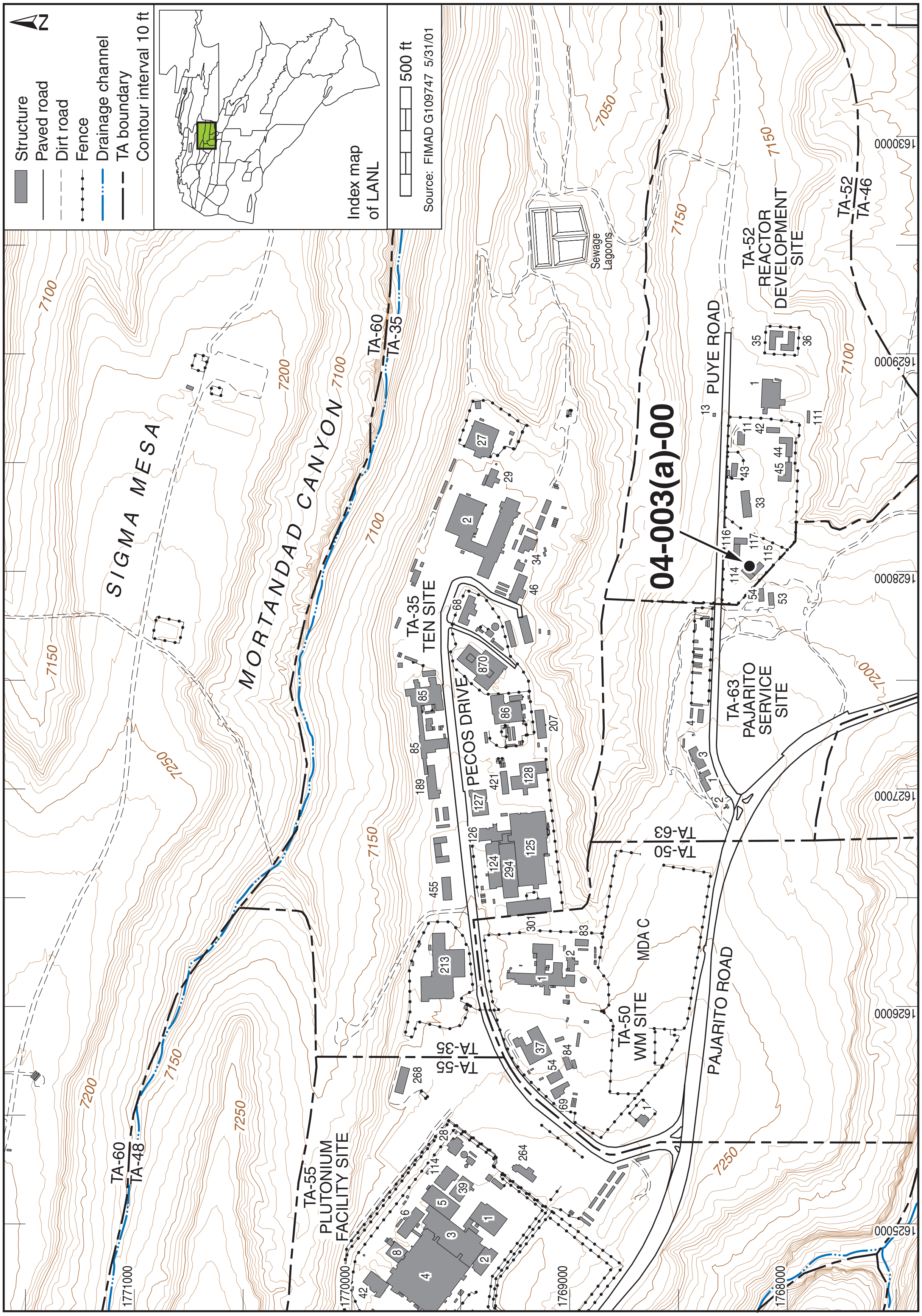
Addendum to RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

RFI Work Plan for Operable Unit 1129 LA-UR Number: 92-0800

Solid Waste Management Units Report, Volume I of IV (TA-0 through TA-9) LA-UR Number: 90-3400

View of AOC 04-004

View of SWMU 04-003(a)



N
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
500 ft
Source: FIMAD G109747 5/31/01
SIGMA MESA
MORTANDAD CANYON
TA-60
TA-35
TA-35 TEN SITE
PECOS DRIVE
Sewage Lagoons
04-003(a)-00
PUYE ROAD
TA-52 REACTOR DEVELOPMENT SITE
TA-52
TA-46
TA-63 PAJARITO SERVICE SITE
TA-63
TA-50
MDA C
TA-50 WM SITE
PAJARITO ROAD
TA-35
TA-55
TA-55 PLUTONIUM FACILITY SITE
TA-60
TA-48

TA-52, Reactor Development Site

TA-52 provides a wide variety of theoretical and computational research and development activities related to nuclear reactor performance and safety, as well as to several environment, safety, and health activities. The work carried out at this site involves both classified and unclassified activities. Classified work is conducted in an area protected by a security fence.

TA-52 suffered minor damage from the Cerro Grande fire. One trailer (structure 52-111) was destroyed, and two transportables (structures 52-35 and -36) required filter replacement.

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SWMU 52-001(d) — Former Facility Equipment

Technical Area	TA-52	**Has ER Sampled the Site?**	No
Dates of Operation	1965-1970	**ER Remedial Action Conducted?**	No
Former Operable Unit	OU 1129	**Other Remedial Action Conducted?**	Yes
Structure Number	N/A	**Aggregate Area (reporting)**	Upper Cañada del Buey

Unit Description

SWMU 52-001(d) is the historical site of contaminated equipment inside the reactor development building (Building 52-1) at TA-52. This equipment was associated with the UHTREX. The equipment included the sump pump room (Room 303), hot cells, and duct work. The sump pump probably received contaminated wastes. Hot cells were located in Rooms 104, 211, 212, and 213. UHTREX was intended for the advancement of high-temperature, gas-cooled reactor technology and research and development of new fuels. However, plans to operate UHTREX with uranium-thorium fuel elements and other fuels with high yield of fission products did not materialize. Instead, UHTREX was used for reactor experiments from 1965 to 1968. Criticality was attained in August 1967, and the reactor operated for only about one year. In 1970, the reactor was shut down and the fuel was removed. The contaminated equipment was removed in 1989 and the building was decontaminated. Building 52-1 currently houses the offices and laboratories of N-Division.

ER Project Activities

Activities conducted at this site are described in detail in the documents listed in the reference section below.

This SWMU was recommended for NFA in the March 1995 permit modification request because it was remediated in accordance with applicable regulations, and available data indicate that contaminants pose no potential unacceptable level of risk under current and projected future land use. The recommendation was not accepted. Additional documentation will be provided to the NMED in support of the NFA recommendation.

ER Project Sampling Summary

No analytical samples have been collected at this site.

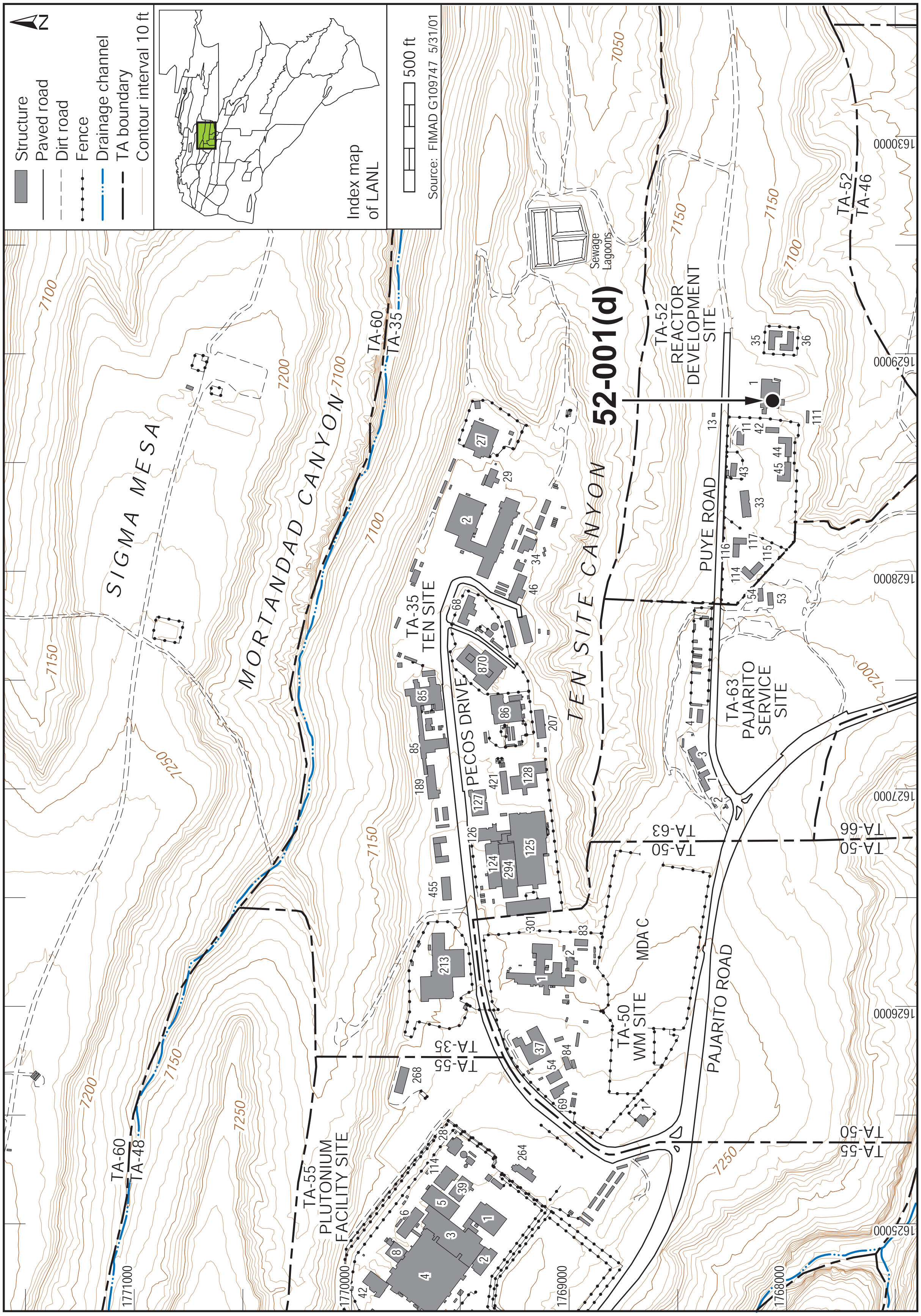
References

Request for Permit Modification, Units Proposed for NFA, March 1995	LA-UR Number: 95-0767
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume IV of IV (TA-51 through TA-74)	LA-UR Number: 90-3400

View of SWMU 52-001(d)

View of SWMU 52-001(d)

View of SWMU 52-001(d)



N
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
500 ft
Source: FIMAD G109747 5/31/01
52-001(d)
SIGMA MESA
MORTANDAD CANYON
TEN SITE CANYON
TA-35 TEN SITE
TA-52 REACTOR DEVELOPMENT SITE
TA-63 PAJARITO SERVICE SITE
TA-50 WM SITE
MDA C
TA-55 PLUTONIUM FACILITY SITE
PECOS DRIVE
PUYE ROAD
PAJARITO ROAD
Sewage Lagoons
TA-60
TA-35
TA-48
TA-55
TA-50
TA-63
TA-66
TA-52
TA-46
1630000
1629000
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1770000
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1768000
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7250

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SWMU 52-002(a) — Septic System

Technical Area	TA-52	**Has ER Sampled the Site?**	Yes
Dates of Operation	1965-Present	**ER Remedial Action Conducted?**	No
Former Operable Unit	OU 1129	**Other Remedial Action Conducted?**	No
Structure Number	52-3, 52-4	**Aggregate Area (reporting)**	Middle Mortandad/ Ten Site Canyon

Unit Description

SWMU 52-002(a) is the septic system that serves Building 52-1. Historically, Building 52-1 housed UHTREX. Currently, the building houses offices and laboratories. This septic system was installed in 1965 and consists of a 2580-gal. tank (structure 52-3) and its associated distribution box (structure 52-4). The system is located north of Building 52-1, approximately 30 ft north of Puye Road and 10 ft east of former Building 52-2 [former waste neutralization and pumping facility, SWMU 52-003(a)]. Overflow from the tank flowed to a 300-ft-long tile drainfield trench that turns west and then east near the edge of Ten Site Canyon. The tank was designed to receive only sanitary waste; however, hazardous constituents and/or radionuclides may historically have entered the system.

ER Project Activities

Activities conducted at this site are described in detail in the documents listed in the reference section below.

Phase I RFI sampling was conducted at SWMU 52-002(a) in 1995. Twenty-six samples were collected from six locations to a depth of 20 feet bgs and submitted for organic chemical, inorganic chemical, and radionuclide analyses.

In 2004, the ER Project re-sampled this SWMU to address additional data needs identified following 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions.
In addition, the data from the Middle Mortandad/Ten Site aggregate will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

ER Project Sampling Summary

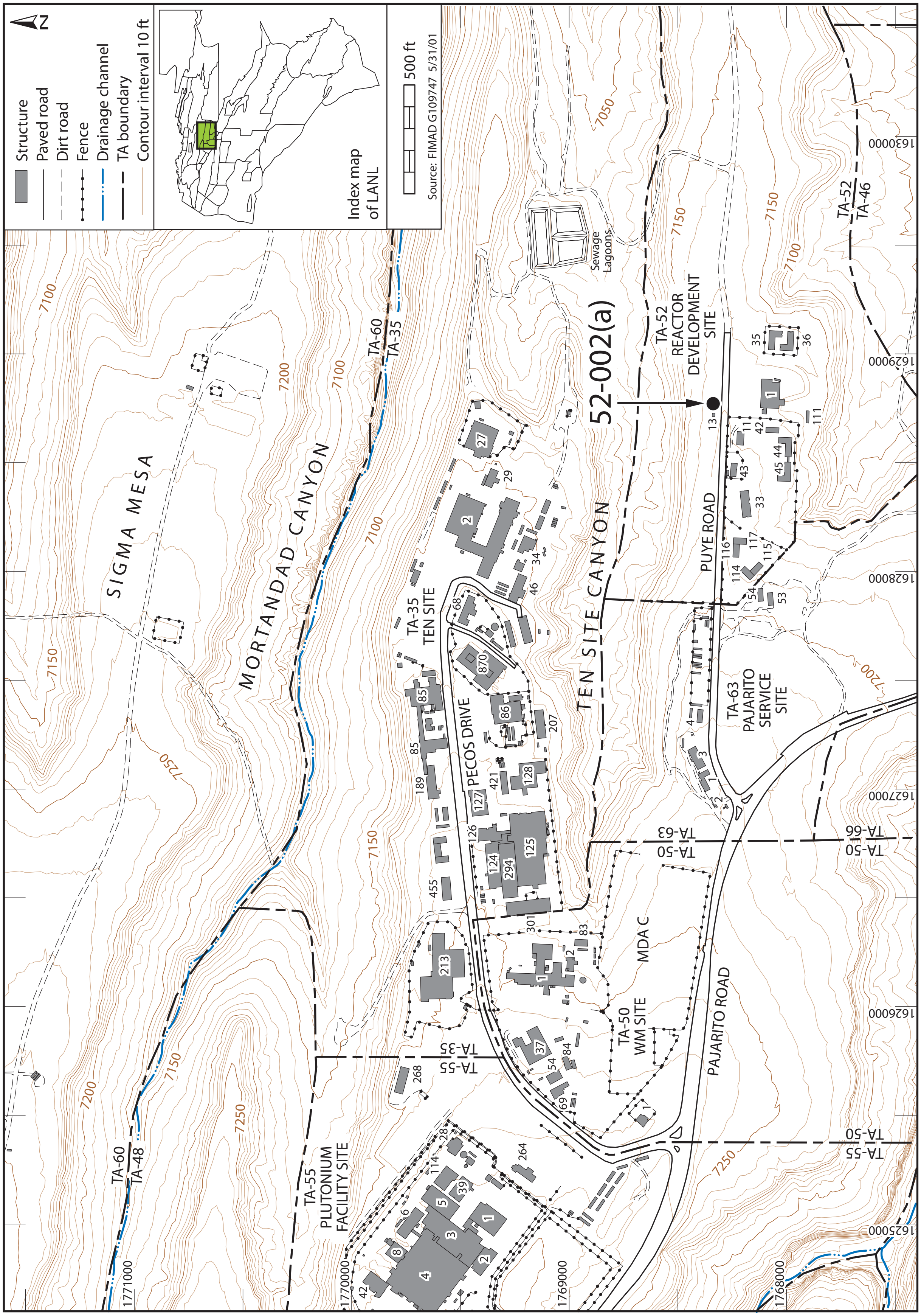
The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	✓	N/A	—

References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate	LA-UR Number: 04-1714
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume IV of IV (TA-51 through TA-74)	LA-UR Number: 90-3400

No photo available



Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
500 ft
Source: FIMAD G109747 5/31/01
52-002(a)
TA-52 REACTOR DEVELOPMENT SITE
Sewage Lagoons
SIGMA MESA
MORTANDAD CANYON
TEN SITE CANYON
TA-35 TEN SITE
PECOS DRIVE
PUYE ROAD
PAJARITO ROAD
TA-63 PAJARITO SERVICE SITE
MDA C
TA-50 WM SITE
TA-55 PLUTONIUM FACILITY SITE
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TA-48
TA-52
TA-46
TA-63
TA-50
TA-66
TA-55
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1625000
1771000
1770000
1769000
1768000

AOC 52-003(a) — Former Wastewater Treatment Facility

Technical Area	TA-52	**Has ER Sampled the Site?**	Yes
Dates of Operation	1965-1989	**ER Remedial Action Conducted?**	No
Former Operable Unit	OU 1129	**Other Remedial Action Conducted?**	Yes
Structure Number	52-2	**Aggregate Area (reporting)**	Middle Mortandad/ Ten Site Canyon

Unit Description

AOC 52-003(a) is the site of TA-52's former waste neutralization and pumping facility (former Building 52-2) that was located about 200 ft north of the UHTREX facility on the north side of Puye Road. The waste neutralization and pumping facility was designed for caustic pretreatment of UHTREX liquid acid wastes, to neutralize them, before they were piped to TA-50. This treatment facility included five tanks: two 5000-gal. concrete waste holding tanks on the north side of the building (which were recessed into the ground at basement level); two tanks located in the basement (size and purpose unknown); and a mixing tank of less than 50-gal. capacity that was used to neutralize caustics. In addition, a 150-gal. tank on the building's ground-level floor stored sodium hydroxide. Building 52-2, including its associated tanks, was removed in 1989 during UHTREX D&D activities performed by HSE-7. Soils beneath the foundation were excavated to solid tuff, and the area was backfilled, graded, and revegetated. Confirmation soil samples were taken to demonstrate compliance with radiological standards. The samples were not analyzed for nonradiological contaminants.

ER Project Activities

Activities conducted at this site are described in detail in the documents listed in the reference section below.

During the 1995 Phase I RFI at AOC 52-003(a), nine samples were collected from three locations, to a depth of approximately 20 ft in the backfill material and submitted for organic chemical, inorganic chemical, and radionuclide analyses.

In 2004, the ER Project re-sampled this AOC to address additional data needs identified following 1995 RFI sampling activities. Sample analysis results will be used to evaluate risk at the aggregate scale and make recommendations for future actions. In addition, the data from the Middle Mortandad/Ten Site aggregate will be integrated with data from other aggregates within the Mortandad watershed to evaluate cumulative risk and determine final actions for the entire Mortandad watershed.

ER Project Sampling Summary

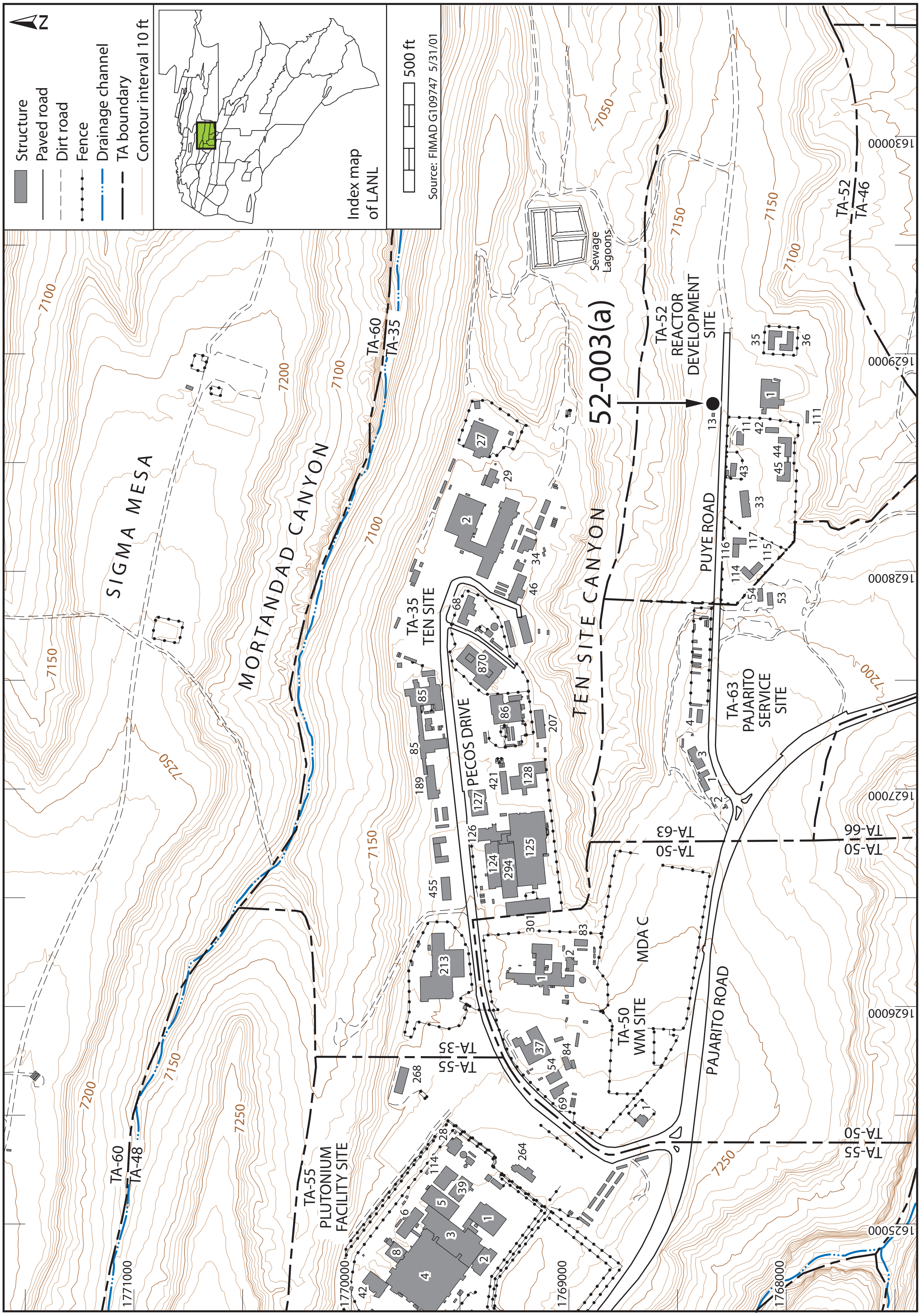
The following table shows the analytical suites that exceeded BVs, FVs, and SSL/SALs that were in use in FY2004. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SSL/SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

Analytical Suite Sampled	Analytical Suite Detected?	Analytical Suite >FY2004 BV/FV (If Applicable)	Analytical Suite >FY2004 SSL/SAL (Residential)
Inorganic chemicals	✓	✓	—
Radionuclides	✓	✓	—
SVOCs	✓	N/A	—
VOCs	✓	N/A	—

References

Supplemental Sampling and Analysis Plan for Middle Mortandad/Ten Site Aggregate	LA-UR Number: 04-1714
Addendum to RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
RFI Work Plan for Operable Unit 1129	LA-UR Number: 92-0800
Solid Waste Management Units Report, Volume IV of IV (TA-51 through TA-74)	LA-UR Number: 90-3400

Former location of Building 52-2 [AOC 52-003(a)]



Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
500 ft
Source: FIMAD G109747 5/31/01
52-003(a)
TA-52 REACTOR DEVELOPMENT SITE
TA-35 TEN SITE
TA-63 PAJARITO SERVICE SITE
TA-50 WM SITE
TA-55 PLUTONIUM FACILITY SITE
MDA C
SIGMA MESA
MORTANDAD CANYON
TEN SITE CANYON
PECOS DRIVE
PUYE ROAD
PAJARITO ROAD
Sewage Lagoons
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1626000
1625000
1771000
1770000
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6.0 REFERENCES

"Compliance Order on Consent" signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California and the New Mexico Attorney General, March 1, 2005.

EPA, 1994, "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515," effective date May 19, 1994, U.S. Environmental Protection Agency, Region 6, Hazardous Waste Management Division, Dallas, Texas.

LANL, 2006 and all recent revisions, "Solid Waste Management Unit and Area of Concern Report," LA-UR-06-2183, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2006 and all recent revisions, "Los Alamos National Laboratory General Part A Permit Application, Revision 5.0, April 2006," LA-UR-06-2553, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2003 and all recent revisions, "Los Alamos National Laboratory General Part B Permit Application, Revision 2.0, August 2003," LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002b and all recent revisions, "Packing TRU Waste Containers," NMT7-WI3-SOP-TA55-013, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 2002c and all recent revisions, "Managing Solid Low-Level Waste at TA-55," NMT7-HCP-TA55-DP-02L, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1999 and all recent revisions, "Certification and Disposal of Low-Level, Oversize Waste," NMT7-WI3-TA55-HCP-DP-02L, Los Alamos National Laboratory, Los Alamos, New Mexico.

APPENDIX A

FACILITY DESCRIPTION

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AASHTO	American Association of State Highway and Transportation Officials
amsl	above mean sea level
D&D	decommissioning and demolition
DOE	U.S. Department of Energy
ft	feet/foot
HE	high explosives
in.	inch(es)
LANL	Los Alamos National Laboratory
NNSA	National Nuclear Safety Administration
POV	privately-owned vehicles
R&D	Research and Development
sf	square feet
TA	technical area
TRUPACT	transuranic waste package transporter
TRUWF	Transuranic Waste Facility

APPENDIX A
FACILITY DESCRIPTION

The information provided in this appendix is submitted in accordance with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), revised October 1, 2003 [10-01-03]. The following subject areas are addressed in this appendix or are referenced to permit renewal documentation for Los Alamos National Laboratory (LANL):

- A general description of the LANL facility and a general description of Technical Area (TA) 52 [20.4.1 NMAC § 270.14(b)(1)];
- Site-specific traffic patterns, volume, and control [20.4.1 NMAC § 270.14(b)(10)];
- Site-specific facility location information for compliance with the seismic standard and floodplain requirements [20.4.1 NMAC §§ 270.14(b)(11) and 270.14(b)(19)(ii), and 20.4.1 NMAC § 264.18(a) and (b)];
- Site-specific topographic map requirements [20.4.1 NMAC § 270.14(b)(19)];
- Site-specific groundwater monitoring and protection information [20.4.1 NMAC § 270.14(c) and 20.4.1 NMAC § 264.90(a)].

A.1 GENERAL DESCRIPTION [20.4.1 NMAC § 270.14(b)(1)]

LANL is located in Los Alamos County, an incorporated county, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The regional location of LANL is shown on Figure A-1. LANL is divided into TAs, as shown on Figure A-2. LANL, which occupies an area of approximately 40 square miles, and the associated residential and commercial areas of Los Alamos County, which occupy an area of approximately 109 square miles, are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons. Ephemeral, interrupted, or intermittent streams lie at the bottoms of all the canyons. The mesa tops range in elevation from approximately 7,800 feet (ft) above mean sea level (amsl) at the flank of the Jemez Mountains, located to the west of Los Alamos, to about 6,200 ft amsl at their eastern extent, where they terminate above the Rio Grande.

LANL's central mission is the reduction of global nuclear danger supported by research that also contributes to conventional defense, civilian, and industrial needs. This includes programs in nuclear, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine; health and biotechnology; and industrial partnerships. LANL is owned by the U.S.

Department of Energy (DOE) and is operated jointly by the DOE National Nuclear Security Administration and the Los Alamos National Security, LLC. The facility mailing address is P.O. Box 1663, Los Alamos, New Mexico, 87545.

LANL is an existing treatment and storage facility. This permit modification request is submitted for the addition of the Transuranic Waste Facility (TRUWF) that will be located at TA-52 to the LANL Hazardous Waste Facility Permit. Permit renewal documentation has previously been submitted for treatment and storage units that are current or proposed "active" operating units.

Hazardous waste is generated at LANL primarily from research and development (R&D) activities, general facility operations, corrective action activities, and decontamination and decommissioning (D&D) projects. Mixed low-level waste is generated mainly from R&D activities, processing and recovery operations, general facility operations, D&D projects, and corrective action activities. Mixed transuranic waste is generated primarily from R&D activities, processing and recovery operations, and D&D projects. High explosives (HE) contaminated waste is generated mainly from R&D activities, corrective action activities, wastewater treatment processes, and building maintenance and modification activities. Brief descriptions of specific hazardous and mixed waste management units at LANL are presented in this permit modification package and in permit renewal documents, as appropriate. Waste generated from R&D activities, processing and recovery operations, and corrective action activities may be received from off-site facilities, as described in the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

A.1.1 Transuranic Waste Facility General Description [20.4.1 NMAC §270.14(b)(1)]

The TRUWF (Building 190) will be located at TA-52 on a mesa between a branch of Mortandad Canyon on the north and Pajarito Canyon on the south in the north central portion of LANL. The TRUWF is currently scheduled for beginning construction of the requested permitted building in 2010 and for completion in 2012. This hazardous waste management unit will be located on approximately 7 acres. The TRUWF will be approximately 28,100-sf (square feet). The layout of the facility is depicted in Figure A-3 with the location of areas where storage will occur highlighted.

A.2 TRAFFIC PATTERNS [20.4.1 NMAC §270.14(b)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in the most recent version of the LANL General Part B Permit Renewal

Application (LANL, 2003). Roadways will be provided for truck and trailer storage, spare Transuranic Waste Package Transporter (TRUPACT) II storage, and access for staff and traffic to onsite roads.

A.2.1 Routes of Travel

Hazardous and/or mixed waste is occasionally transported to and from TA-52 to other areas at LANL (e.g., TA-54). The primary traffic routes that will be used to transport hazardous and mixed waste to and from TA-52 include Diamond Drive, Pajarito Road, and Puye Drive as shown on Figures A-4 and A-5.

A.2.2 Traffic Volumes

The buildings at TA-52 are located northwest of the intersection of Pajarito Road and Pecos Drive, as shown on Figure A-5. According to a traffic study conducted by Johnson Controls World Services, Inc. (JCI) (JCI, 1999), Pajarito Road has an average daily traffic volume of 12,000 vehicles. This includes vehicles traveling both northwest and southeast. Pecos Drive has an average daily traffic volume of 5,000 vehicles per day. This includes vehicles traveling both north and south. These values are based on a 24-hour period. Vehicle types include cars, light- and medium-duty trucks, and vans.

A.2.3 Traffic Control Signals

Roadway access is required for privately-owned vehicles (POV), site vehicles, TRUPACT II tractors/semi-trailers, other waste trucks, delivery vehicles, and characterization trailers. The TRUWF will be located north of Puye Road at TA-52, which is connected approximately 1500 ft west of the facility to Pajarito Road, a major east-west route at LANL. The locations of proposed traffic control signals at the TRUWF are shown on Figure A-5. Other traffic control signals on Puye Road include stop signs, posted speed limits, a traffic light, and other traffic and pedestrian control signs.

A.2.4 Road Load-Bearing Capacity

Roads within TA-52 are generally two lane roads with asphaltic-concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch (in.) thick base with a 3-in. thick asphaltic-concrete surface. These roads were designed and constructed to meet the American Association of State Highway and Transportation Officials (AASHTO) specification HS-20 (AASHTO, 1996).

A.3 LOCATION INFORMATION [20.4.1 NMAC §270.14(b)(11)]

A.3.1 Seismic Standard [20.4.1 NMAC §270.14(b)(11)(i - ii) and 20.4.1 NMAC §264.18(a)]

TA-52 is in compliance with the seismic standards of 20.4.1 NMAC §270.14(b)(11) and 20.4.1 NMAC §264.18(a) [10-01-03]. Based on information contained in Supplement A.1 of this permit modification submittal, there has been no evidence observed of Holocene faulting within 3,000 ft of the proposed facility.

A.3.2 Floodplain Standard [20.4.1 NMAC §270.14(b)(11)(iii - v) and 270.14(b)(19)(ii); 20.4.1 NMAC §264.18(b)]

The hazardous and mixed waste management units at TA-52 are located on a mesa top. In accordance with 20.4.1 NMAC §270.14(b)(11)(iii) [10-01-03], the hazardous and mixed waste management units addressed in this permit application are not located within the 100-year floodplain boundary. Additional floodplain information is provided in the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

A.4 TOPOGRAPHIC MAPS [20.4.1 NMAC §270.14(b)(19)]

Topographic maps and figures are provided herein or referenced to meet the requirements of 20.4.1 NMAC §270.14(b)(19) [10-01-03]. All maps clearly show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- LANL-wide 100-year floodplain maps are provided as Appendix C of the “Response to Request for Supplemental Information: Technical Adequacy Review, RCRA Permit Application; General Part A,” April 1998, Revision 0.0; and “Los Alamos National Laboratory General Part B,” October 1998, Revision 1.0; Los Alamos National Laboratory, EPA ID No. NM 0890010515” (LANL, 2001).
- A map showing surface waters, including intermittent streams, near TA-52 is included as Figure A-6.
- Surrounding land uses are shown on Figure A-1.
- Wind roses for TA-6, the TA directly west-northwest of TA-52, are shown on Figures A-7 and A-8.
- A map showing the boundaries of LANL (including TA-52) is provided as Figure A-2.
- Access control features at TA-52 (e.g., fences, gates) are included on Figure A-5.

- A map showing supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near TA-52 is included as Figure A-6 of this permit modification request and on Map 3 of the most recent version of the “Los Alamos National Laboratory General Part A Permit Application,” hereinafter referred to as the LANL General Part A (LANL, 2006).

- The locations of proposed buildings, hazardous waste management unit, and loading and unloading areas at the TRUWF are shown on Figure A-3.

- A map showing National Pollutant Discharge Elimination System point source discharge locations is included in the most recent version of the LANL General Part A (LANL, 2006).

- Storm, sanitary, and process sewer systems at LANL are shown the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003). The TRUWF will be connected to the LANL sanitary system and storm water pollution prevention and drainage systems will be installed.

- Drainage control features (e.g., run-on/runoff) are shown on Figure A-9.

- Fire stations serving LANL and the County of Los Alamos are shown the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

- The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown the most recent version of the LANL General Part A Permit Application (LANL, 2006).

Contour lines on the topographic map (Figure A-6) are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management unit proposed for TA-52. As provided in 20.4.1 NMAC §270.14(b)(19) [10-01-03], LANL has submitted the maps to the New Mexico Environment Department at these scales and contour intervals due to the size of the waste management units, the extent of the LANL facility, and the topographic relief in the area.

A.5 GROUNDWATER MONITORING [20.4.1 NMAC, Subpart IX, 270.14(c) and 20.4.1 NMAC, Subpart V, 264.90(a)]

Groundwater monitoring information is provided in the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

A.6 OTHER PERMIT ACTIVITIES

Other types of Resource Conservation and Recovery Act permits include, but are not limited to, the following:

- Permits by Rule
- Emergency Permits

- Hazardous Waste Incinerator Permits
- Permits for Land Treatment Demonstrations Using Field Test or Laboratory Analyses
- Interim Permits for Underground Injection Control Program Wells
- Research, Development, and Demonstration Permits
- Permits for Boilers and Industrial Furnaces Burning Hazardous Waste

Currently, none of these permit types are in effect for operations at TA-52.

A.7 REFERENCES

AASHTO, 1996 and all approved updates, "Standard Specifications for Highway Bridges," 16th Edition, American Association of State Highway and Transportation Officials.

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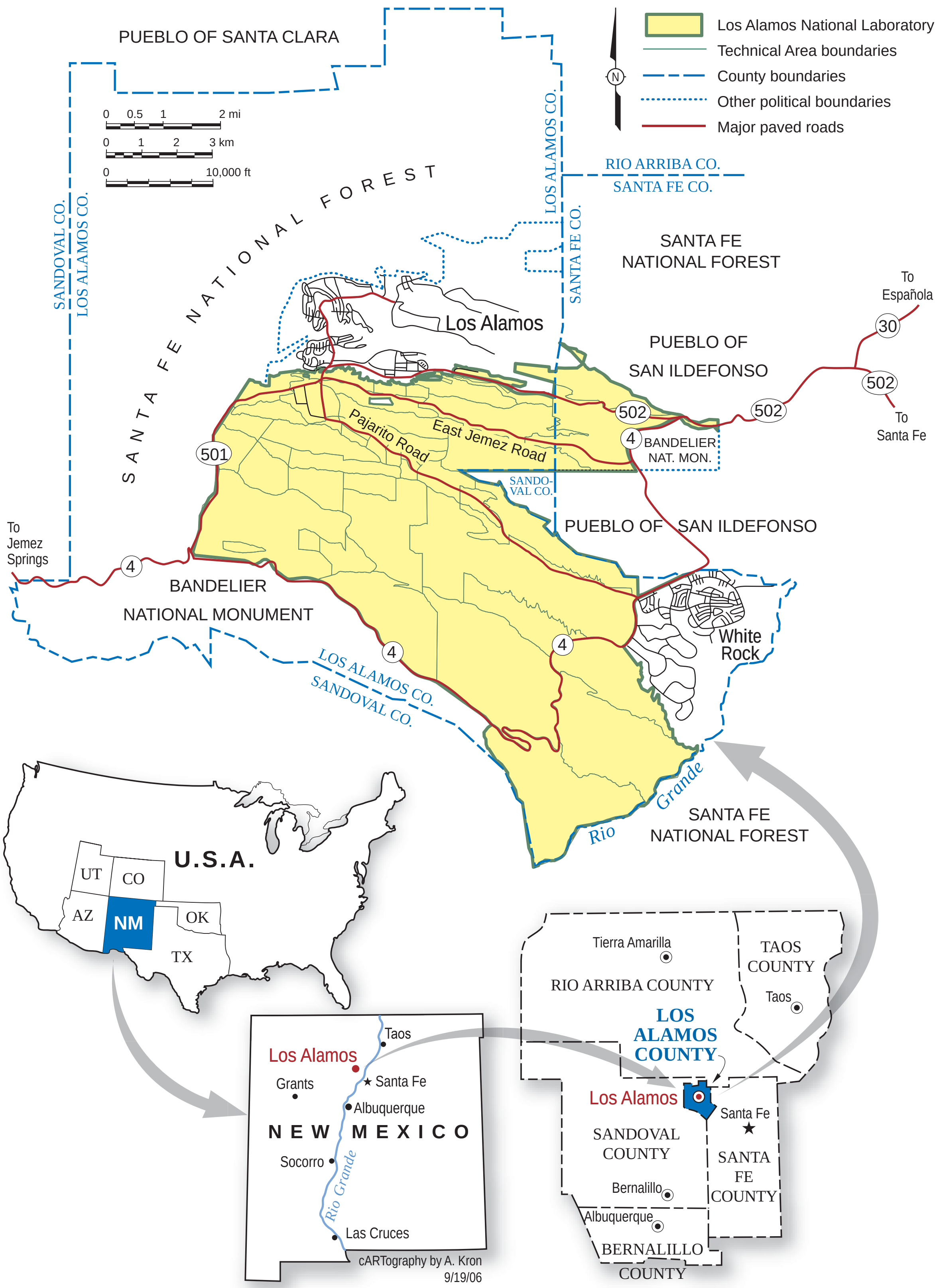

Figure A-1

Regional Location Map of Los Alamos National Laboratory and Surrounding Land Use

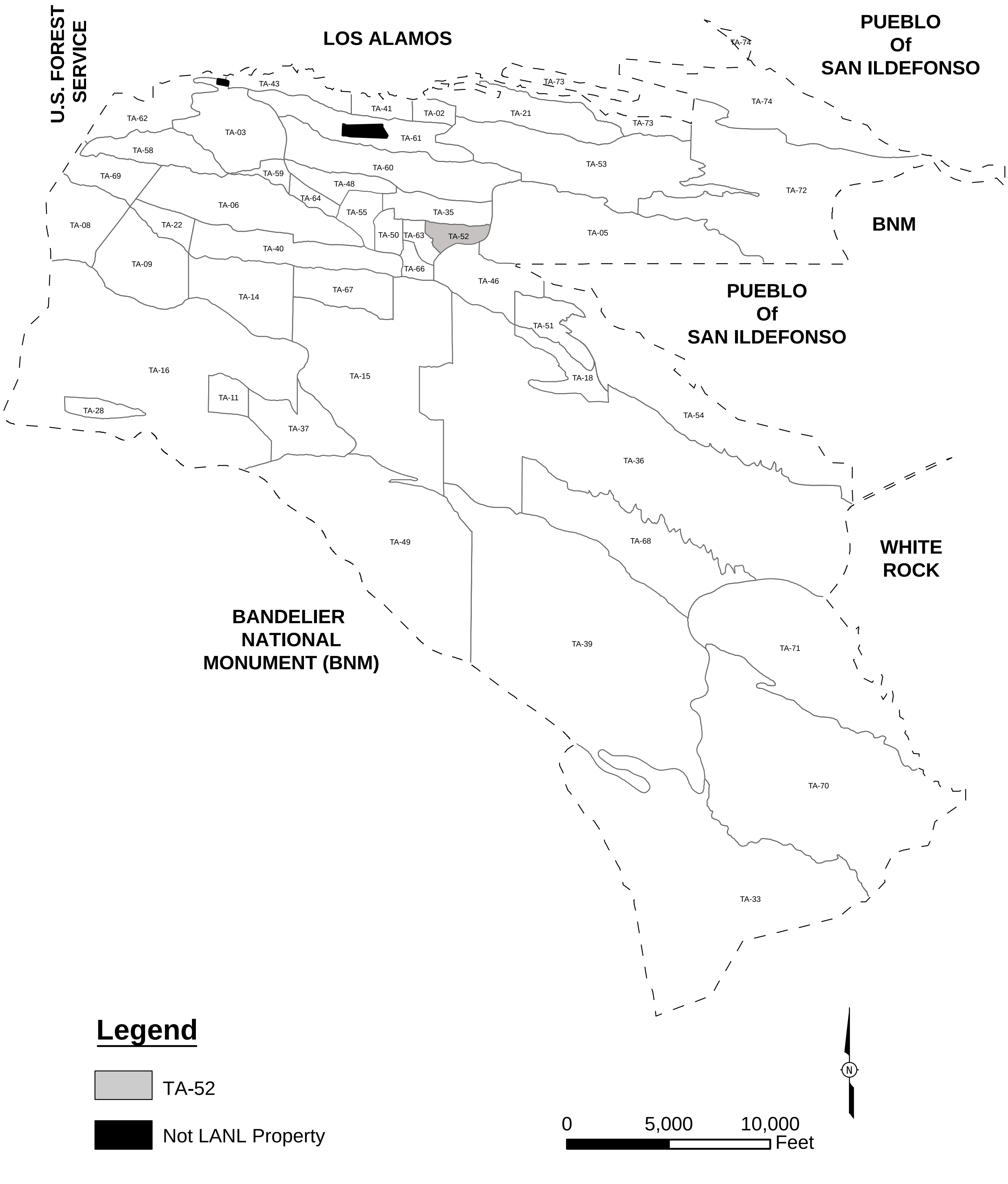

Figure A-2

Location of Technical Area (TA) 52 at Los Alamos National Laboratory (LANL)

Created by ERSS GIS TEAM. Map Number 06-0108 September12, 2005
State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)
This map was created for work processes associated with the Environmental &Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff.
Boundary of Department of Energy Property I Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; infrastructure Planning Office. 10 February 2006
Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; 01 February 2003 as captured 07 September 2004.

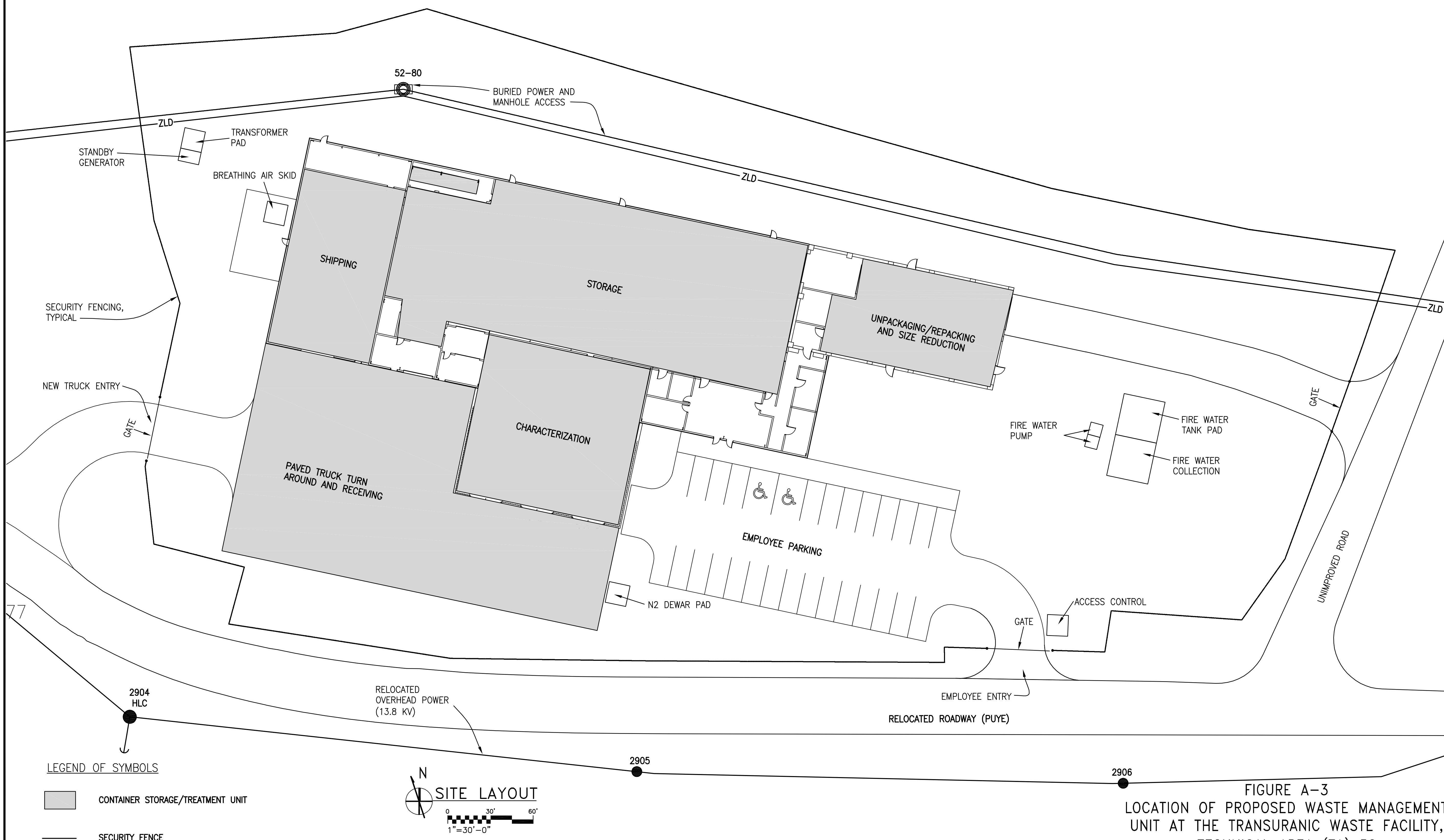

FIGURE A-3
LOCATION OF PROPOSED WASTE MANAGEMENT UNIT AT THE TRANSURANIC WASTE FACILITY, TECHNICAL AREA (TA) 52

Document:	TRUWF Permit Modification
Revision No.:	0.0
Date:	August 2007

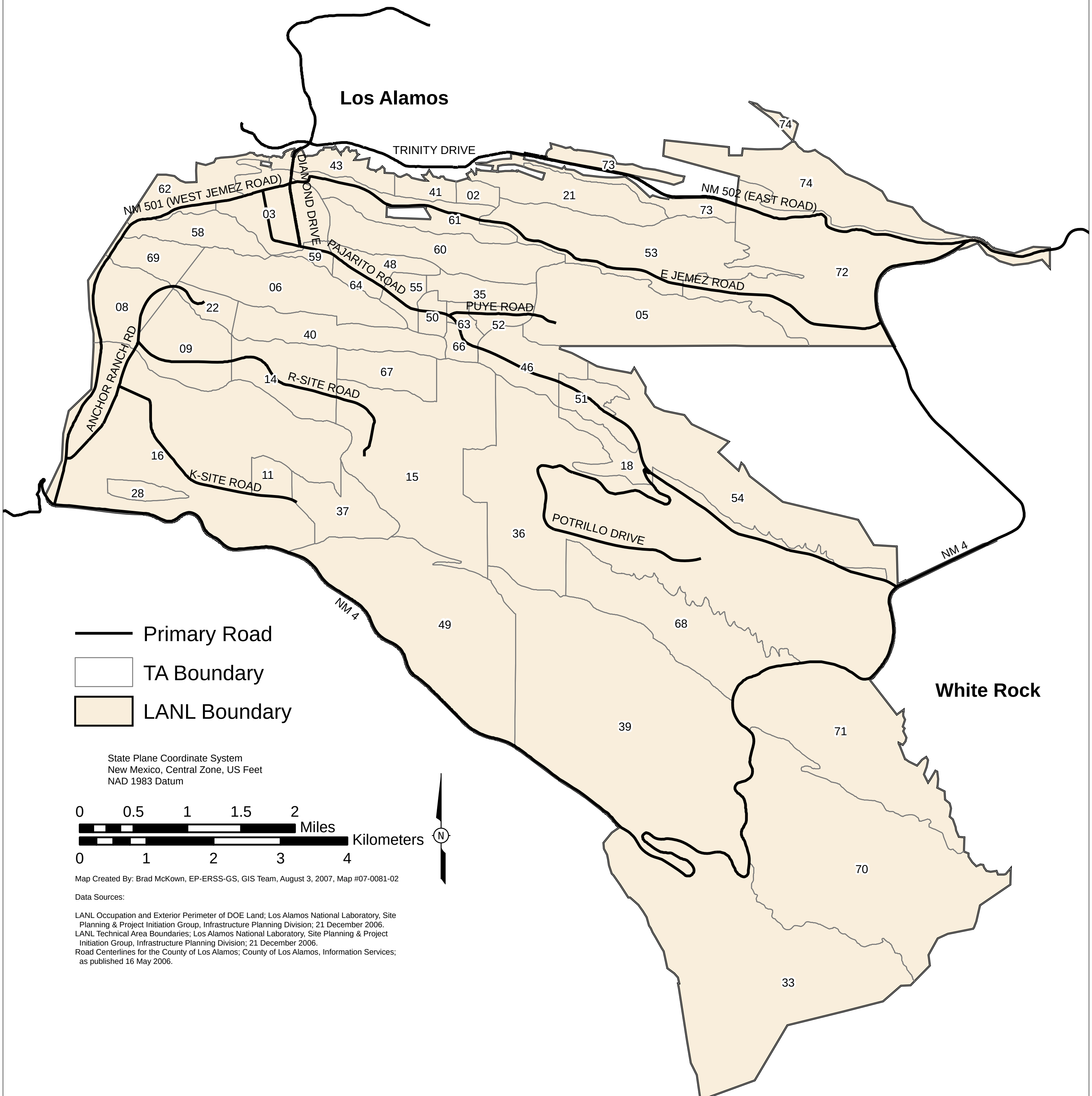

Figure A-4

Major Roads and Primary Traffic Routes at Los Alamos National Laboratory (LANL)

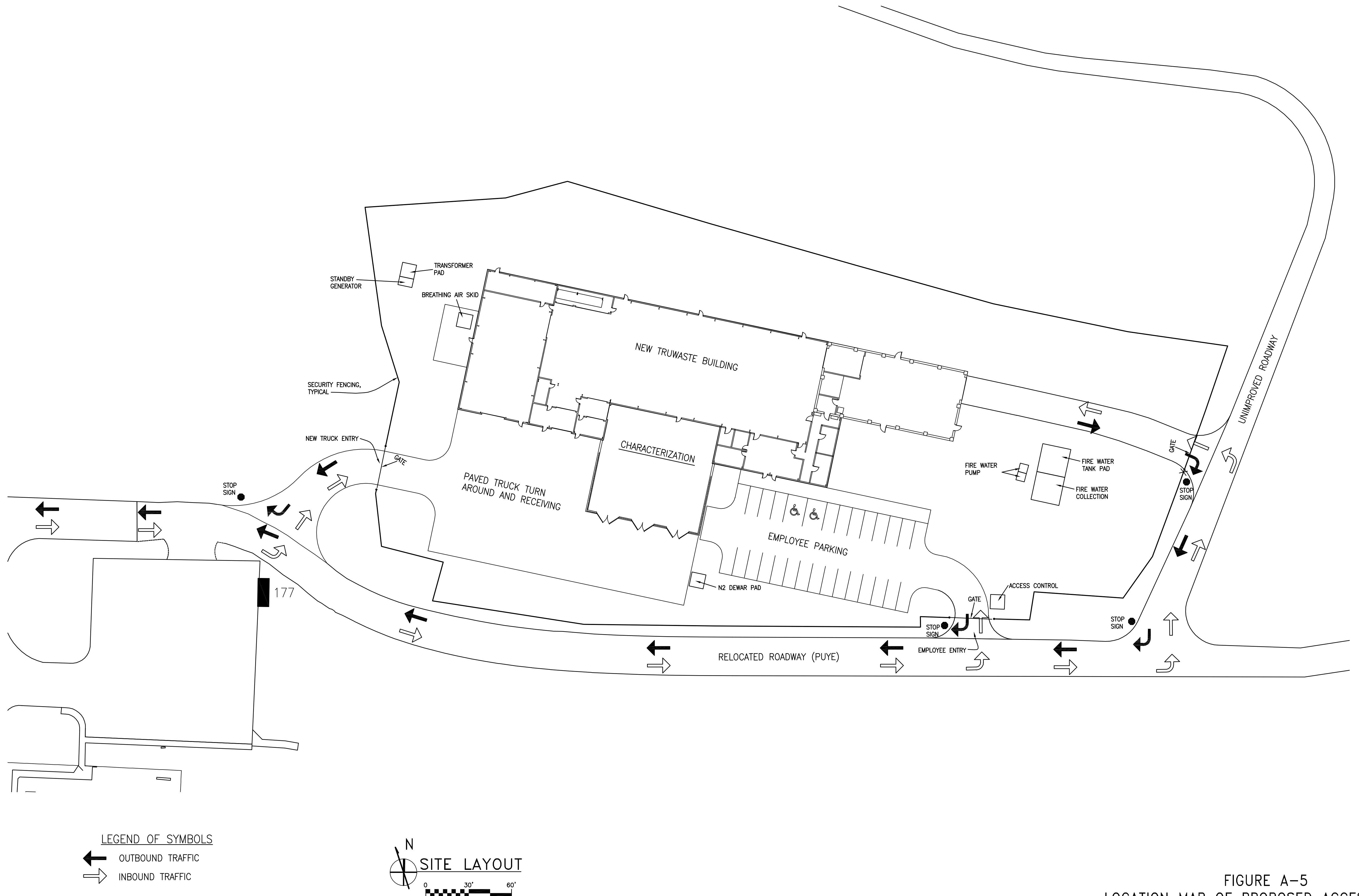

FIGURE A–5
LOCATION MAP OF PROPOSED ACCESS ROADS AND TRAFFIC CONTROL SIGNS IN THE VICINITY OF THE TECHNICAL AREA (TA) 52

1:1,476

State Plane Coordinate System
New Mexico, Central Zone, US Feet
NAD 1983 Datum

Grid Interval 1000 Feet, Contour Interval 2 Feet

Feet 0 190 380 570 760

Meters 0 75 150 225 300

N

Data Sources:

Hypsography, 100, 20, and 10 Foot Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
WQH Drainage_arc; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; 1:24,000 Scale Data; 03 June 2003.
Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 27 April 2007.
Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 July 2007.
Penetrations; Los Alamos National Laboratory, Environment and Remediation Support Services, EP2007-0442; 1:2,500 Scale Data; 16 July 2007.

Map Created By: Brad McKown
EP-ERSS, GIS Team
August 2, 2007
Map #07-0081-01

Figure A.6
Contour Map Showing the Location of the Proposed Hazardous Waste Management Unit at Technical Area (TA) 52

✳	SMA Sampler Location		Storage Building
⊗	Well		Outdoor Storage
	Drainage		TA Boundary
	Paved Road		Structure

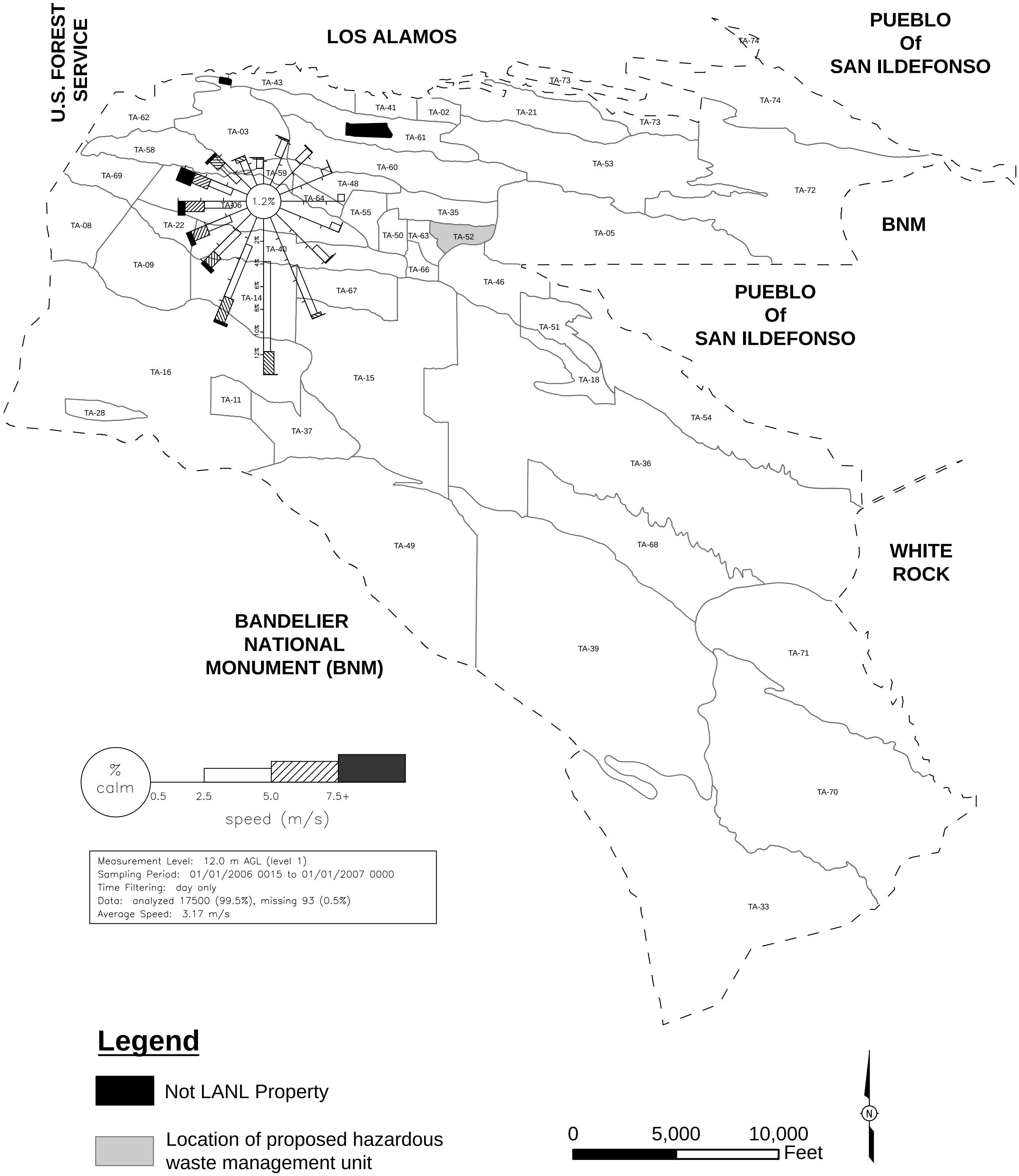

Figure A-7

Annual Wind Rose for Technical Area (TA) 6 at Los Alamos National Laboratory (LANL) -- Day

Created by ERSS GIS TEAM. Map Number 06-0108 September12, 2005
State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)
This map was created for work processes associated with the Environmental &Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff.
Boundary of Department of Energy Property I Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; infrastructure Planning Office. 10 February 2006
Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; 01 February 2003 as captured 07 September 2004.

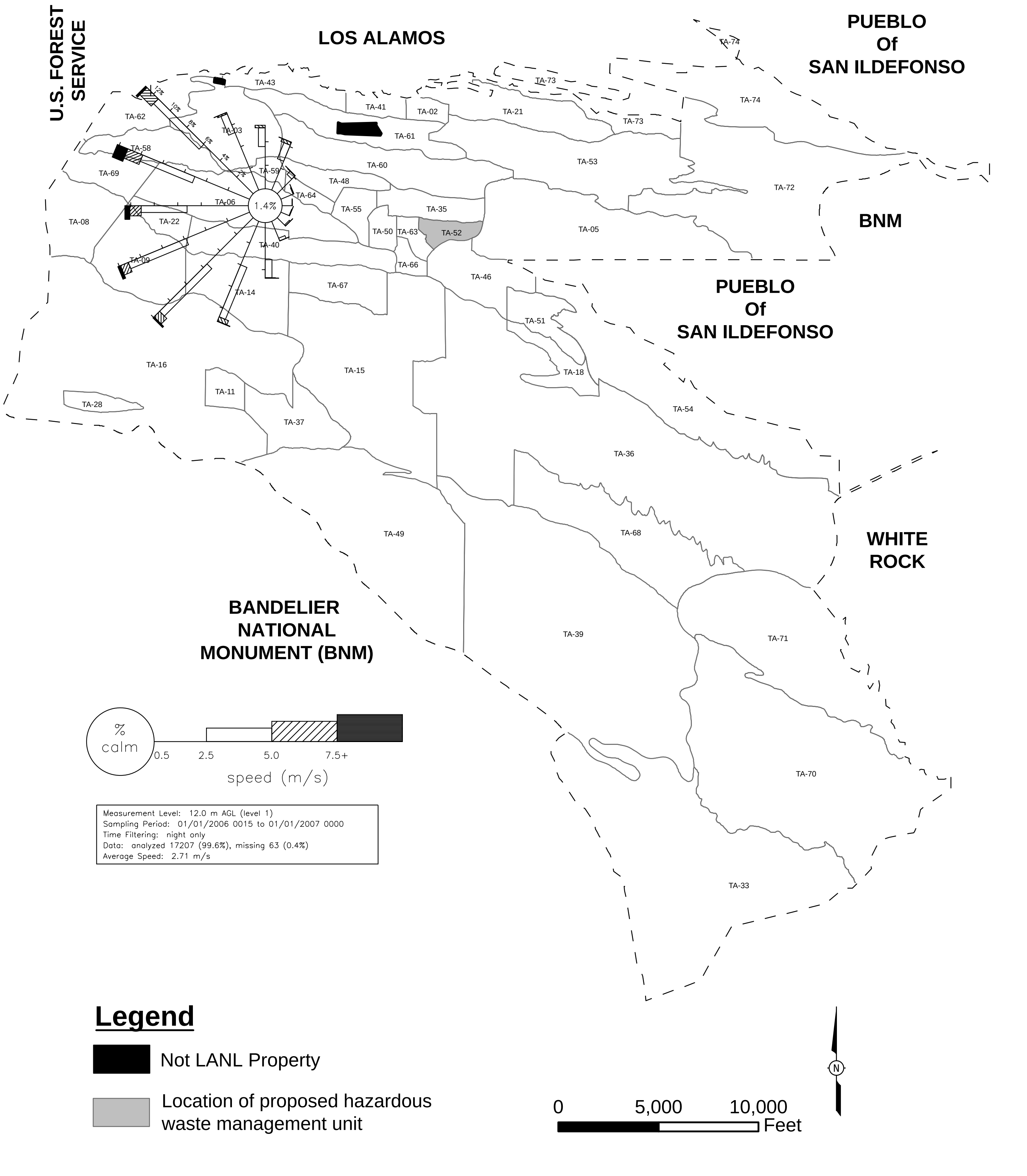

Figure A-8

Annual Wind Rose for Technical Area (TA) 6 at Los Alamos National Laboratory (LANL) -- Night

Created by ERSS GIS TEAM. Map Number 06-0108 September12, 2005
State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)
This map was created for work processes associated with the Environmental &Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff.
Boundary of Department of Energy Property I Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; infrastructure Planning Office. 10 February 2006
Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; 01 February 2003 as captured 07 September 2004.

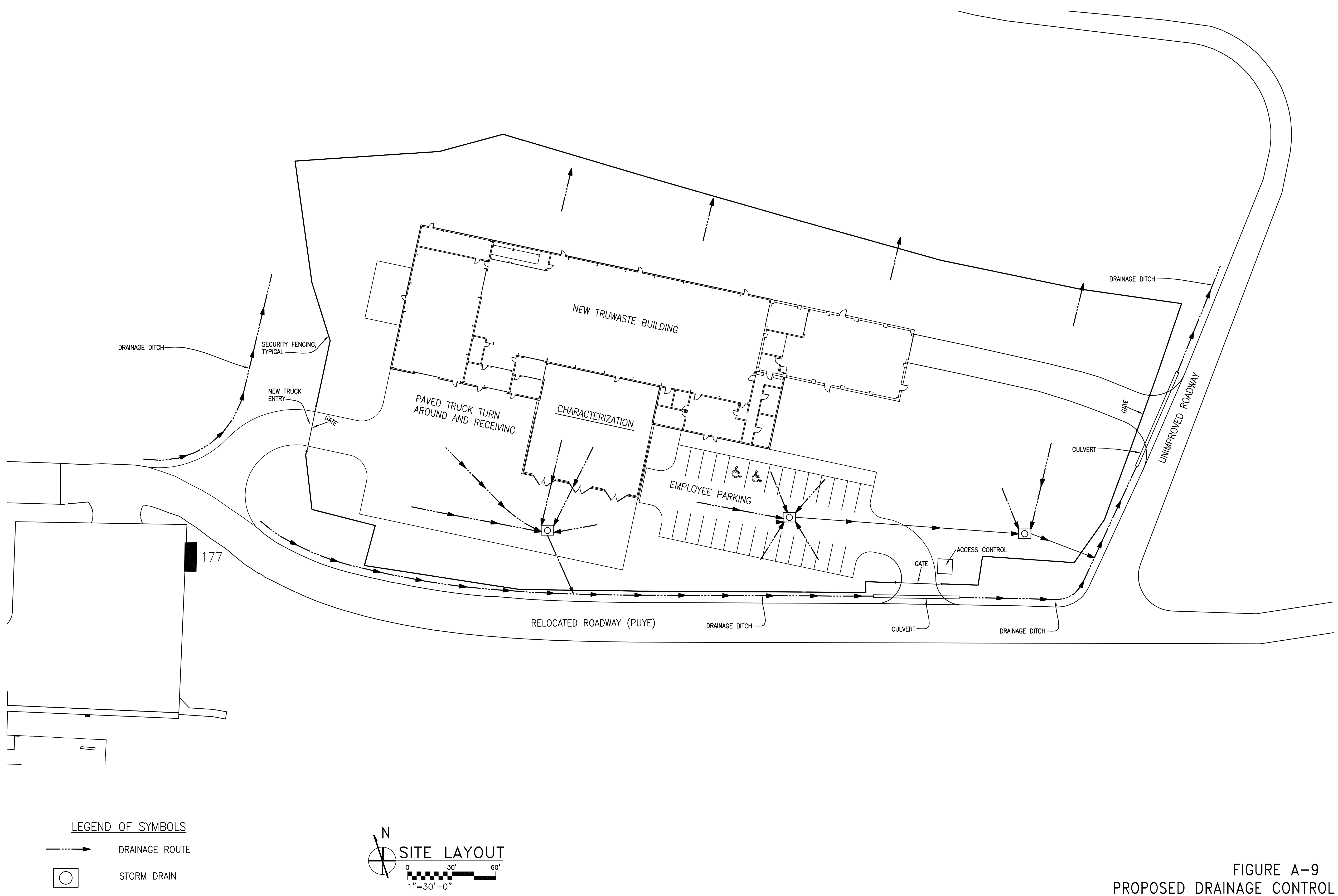

FIGURE A-9
PROPOSED DRAINAGE CONTROL FEATURES AT
THE TRANSURANIC WASTE FACILITY,
TECHNICAL AREA (TA) 52

Supplement A.1

Review of the Geologic And Structural Setting Near the Site of the Proposed Transuranic Waste Facility (TRUWF), Technical Area 52 (TA-52), Los Alamos National Laboratory
LA-UR-07-5191

REVIEW OF THE GEOLOGIC AND STRUCTURAL SETTING NEAR THE SITE OF THE PROPOSED TRANSURANIC WASTE FACILITY (TRUWF), TECHNICAL AREA 52 (TA-52), LOS ALAMOS NATIONAL LABORATORY

Emily S. Schultz-Fellenz and Jamie N. Gardner

LA-UR-07-5191

ABSTRACT

Because of Los Alamos National Laboratory's proximal location to active geologic structures, assessment of seismic hazards, including the potential for seismic surface rupture, must occur prior to construction of any facilities housing nuclear or other hazardous materials. A transuranic waste facility (TRUWF) planned for construction at Technical Area 52 (TA-52) provides the impetus for this report. While no single seismic hazards field investigation has focused specifically on TA-52, numerous studies at technical areas surrounding TA-52 have shown no significant, laterally continuous faults exhibiting activity in the last 10 ka within 3000 ft of the proposed facility. A site-specific field study at the footprint of the proposed TRUWF would not yield further high-precision data on possible Holocene faulting at the site, since post-Bandelier Tuff sediments are lacking and the shallowest subunit contacts of the Bandelier Tuff are gradational. Given the distal location of the proposed TRUWF to any mapped structures with demonstrable Holocene displacement, surface rupture potential appears minimal at TA-52.

I. INTRODUCTION AND RATIONALE

This document evaluates existing literature documenting previous analyses of stratigraphy, structural geology, and/or seismic hazard in the vicinity of the proposed TRUWF at TA-52 of Los Alamos National Laboratory (LANL). Through this, we provide information on the presence or absence of active faults at the proposed facility site and in surrounding technical areas, as well as an assessment of the potential for seismic surface rupture near the footprint of the proposed facility at TA-52.

Siting, design, and construction of waste facilities at Department of Energy (DOE) sites require compliance with Environmental Protection Agency (EPA) regulations for seismic hazards. Standards and compliance for the proposed TRUWF fall within the auspices of the Resource Conservation and Recovery Act (RCRA) of 1976. Seismic considerations for RCRA location standards are presented in the Code of Federal Regulations, Title 40 (40 CFR) Part 264, Subpart B, "General Facility Standards". Regarding the siting of hazardous waste facilities, 40 CFR 264 states that portions of new facilities where treatment, storage, or disposal of hazardous waste will be conducted must not be located within 200 ft (61 m) of a fault that has had displacement in Holocene time (within the last 10,000 years). If Holocene faults are present within 3000 ft (914 m) of a proposed facility, a comprehensive geologic analysis of the site is required.

LANL lies within the Española Basin of the Rio Grande rift (Figure 1), a tectonically active zone of east-west crustal extension along a north-south trending series of asymmetrical basins (e.g. Kelley, 1979; Sanford et al., 1991; Baldridge et al., 1995; Kelson and Olig, 1995). The Rio Grande rift is a major tectonic feature of the North American continent, has been active for at least 30 million years, and continues to be tectonically and magmatically active (e.g. Riecker, 1979; Baldridge et al., 1984; Wolff and Gardner, 1995). In the area of LANL, the Pajarito fault system is the active western margin of the Rio Grande rift. The Pajarito fault system includes the potentially seismogenic Pajarito, Rendija Canyon, and Guaje Mountain faults (Figure 2).

Because of LANL's location relative to active geologic features, seismic hazards, including the potential for seismic surface rupture, must be assessed before construction of any facilities housing nuclear or other hazardous materials. Paleoseismic investigations indicate that there have been three Holocene seismic events of magnitude ~6-7 on the Pajarito fault system (Gardner et al., 1990; Wong et al., 1995; Kelson et al., 1996; McCalpin, 1998, 1999; Reneau et al., 2002; Gardner et al., 2003; LANL Seismic Hazards Geology Team, in prep.). The fault system in the western and northern parts of LANL and west of LANL has been mapped in detail to better understand the kinematics of the fault system and to assess the potential for seismic surface rupture at specific Laboratory sites (e.g. Gardner et al., 1998, 1999, 2001; Lewis et al., 2002; Lavine et al., 2003; Schultz et al., 2003, Lewis et al., in review).

II. GENERALIZED GEOLOGIC SETTING

The proposed site of the TRUWF at TA-52 (Figure 2) sits atop a sequence of Quaternary-aged rhyolitic ash-flow tuffs collectively called the Tshirege Member of the Bandelier Tuff, east of the principal faults of the Pajarito fault system (Gardner et al., 1999). The Tshirege Member (Qbt) of the Bandelier Tuff is a 1.22 million-year-old complex series of ash-flow tuffs erupted from the Valles Caldera, the eastern rim of which is approximately 10 miles (~16 km) west of the TA-52 site (age from Izett and Obradovich, 1994; Figure 1). The suite of eruptive subunits that comprise the Tshirege Member includes pyroclastic surge deposits, which in some locations mark contacts between Tshirege Member subunits. In the vicinity of the proposed TRUWF at TA-52, Qbt is generally subdivided into three principal subunits, or cooling units (from top to bottom: Qbt3, Qbt2, and Qbt1; Figure 3), whose contacts are identified by welding characteristics as well as pumice, phenocryst, and lithic characteristics (Broxton and Reneau, 1995; e.g. Gardner et al., 1999; Lewis et al., 2002; Lavine et al., 2003). Physical characteristics of the tuff (including degree of welding, thickness of cooling units, and post-depositional mineralization) vary with distance from the caldera source. Contacts between the subunits of the Tshirege Member serve as useful markers for determining the presence or absence of faulting (e.g. Gardner et al., 1998, 1999, 2001; Lewis et al., 2002; Lavine et al., 2003; Schultz et al., 2003).

III. PREVIOUS WORK

In 1985, J. Gardner (unpublished data) developed a Los Alamos area fault model projecting the southern termini of the Rendija Canyon and Guaje Mountain faults into LANL technical areas, including the TA-55 area (Plutonium Facility). At the time of development of this early model of the Pajarito fault system, no detailed data existed to define the southward projections of these faults with any certainty. An iteration of this unpublished fault model was obtained in 2002 by the LANL Solid Waste Regulatory Compliance Group and included as Figure A-5 within the LANL TA-50 Part B Renewal Application (LA-UR-02-4739). Since this early fault model was generated, and even prior to publication of the 2002 TA-50 report, a great deal of high-precision geologic mapping has been completed on the southern extent of the Rendija Canyon and Guaje Mountain faults. Studies by Gardner et al. (1999, 2001), Lewis et al. (2002), Lavine et al. (2003), and Lewis et al. (in review) provide detailed geologic data, particularly with respect to structure, which supersedes that presented in Figure A-5 of the TA-50 Part B Renewal Application of 2002 (Figure 2).

Gardner et al. (1999) showed that the geometry of the surface expression of the Rendija Canyon fault, moving along-strike from north to south, begins to bend southwest at Pueblo Canyon, runs beneath the Los Alamos townsite, and continues beneath LANL's main technical area (TA-3) where a series of southwest-trending, small *en-echelon* faults connect the Rendija Canyon fault with the master Pajarito fault. Along-strike from north to south, the last definite surficial expression of the Guaje Mountain fault is at Bayo Canyon in the northern part of the Los Alamos townsite (Gardner et al., 2003). The high-precision surveys and geologic mapping of Gardner et al. (1998, 1999) have shown no vestige of the Rendija Canyon or Guaje Mountain faults in the TA-55, TA-50, or TA-52 areas.

The proposed TA-52 TRUWF is situated approximately 4 miles (6.4 km) east of the Pajarito fault, which is the master structure in the Los Alamos area (Figure 2). The antithetic Rendija Canyon fault is located 1.5 miles (2.5 km) west of TA-52, and the southernmost-mapped expression of the Guaje Mountain fault is 2.5 miles (4 km) north of TA-52 (Figure 4). A southward projection of the Guaje Mountain fault would skirt the eastern boundary of TA-48, approximately 1 mile (1.6 km) west of TA-52.

IV. SITE-SPECIFIC GEOLOGIC STUDIES AT LANL

The site of the proposed TRUWF lies near the margins of detailed geologic mapping studies completed by the LANL Seismic Hazards Geology Team (e.g. Gardner et al., 1999, 2001; Lewis et al., 2002; Lavine et al., 2003; Lewis et al, in review). Figure 4 shows the location of the proposed facility at TA-52 with respect to previous studies and geologic structures. Figure 5 shows the footprint of the proposed facility at TA-52 with respect to mapped geologic contacts and structures within both a 200-ft and a 3000-ft radius of the site, per the requirements of 40 CFR 264. Additional site-specific detailed geologic studies, including trenching, mapping, fracture analyses, and borehole studies, have been completed at technical areas near the proposed facility, and are addressed below in order of increasing distance from the site (after Lewis and Gardner, 2006).

IV.A. Evaluation of the potential for surface faulting at TA-63

Geologic investigations at TA-63 (Figure 4) for a proposed radioactive liquid waste treatment facility (RLWTF) included mapping, trenching, and fracture analysis (Kolbe et al., 1995). Five trenches with a total length of 2250 ft (685 m) were excavated across the full extent (west to east) of TA-63 and southern parts of TA-52. Trenches were oriented perpendicular to the north-south strike of the Guaje Mountain fault, which was thought to pass within the 3000 ft (914 m) envelope surrounding the proposed site. Although ubiquitous north- to north-northeast-striking subvertical fractures in the Bandelier Tuff were observed throughout the trenches, no significant increase in fracture density was noted toward or within the southward projection of the Guaje Mountain fault and no evidence of Holocene faulting was observed. The observed fractures were documented as small tensile openings, and likely do not behave as faults. Kolbe et al. (1995) identified slickensides in a few fractures in unit Qbt3 but concluded they were a result of gravitational slip toward drainages bounding the eastern edge of the site. Additionally, the motion appeared to be quite small (on the order of a few tens of millimeters between blocks). Nevertheless, the probability of Holocene movement on fractures could not be fully discounted due to the lack of continuous late Quaternary deposits across the area of investigation. Kolbe et al. (1995) also indicated that if deformation was distributed over a wide zone, small offsets (sub-centimeter) could easily be unrecognizable in the Bandelier Tuff or post-Bandelier deposits.

IV.B. Conceptual design report for the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) upgrade project

Kleinfelder, Inc. performed exploratory drilling of eight borings to depths of 23-26.5 ft (7.0-8.1 m) was using a hollow-stem auger (DMJM H&N, 2005). One boring was extended to a depth of 90 ft (27.4 m) for environmental purposes only. Logs indicate the presence of Bandelier Tuff at depths of 2-9 ft (0.6-2.7 m) beneath fill. Subunits of Bandelier Tuff were not distinguished in their report and contacts between said subunits were not noted, but all tuff in the borings appears to be poorly welded, purple to brown in color, and slightly to extensively fractured. Based on rock outcrop in the area, as well as observations from the boring logs, the tuff present in the borings is likely to be Qbt3. Unit Qbt4 is not present in outcrop at TA-50, but could be present in localized areas in the subsurface where post-Bandelier Tuff deposits have been preserved (see Kolbe et al., 1995).

IV.C. Seismic Hazards investigations at and near TA-55

Geologic studies performed in the TA-55 area include geologic mapping and trenching (Dames and Moore, 1972; Purtymun et al., 1995; Gardner et al., 1998, 1999). As part of a geologic study of TA-55, Vaniman and Wohletz (1990) demonstrated high fracture density and large fracture apertures in Bandelier Tuff where East Jemez Road crosses the southward projection of the Guaje Mountain fault (near the intersection of East Jemez Road and La Mesita Road, the entrance to TA-53). Detailed geologic mapping of Gardner et al. (1998, 1999) included total station surveying of the Qbt3-Qbt4 contact along Pajarito Road, and the Qbt2-Qbt3 contact in Mortandad Canyon to the north and Twomile Canyon to the south. The most useful marker horizon for identifying small-displacement faults [<1 ft (0.3 m) vertical displacement] in this area is the Qbt3-Qbt4 contact, which is generally quite sharp and commonly marked by a pyroclastic surge deposit. The Qbt2-Qbt3 contact is gradational over approximately 3 ft (1 m), and is not as useful for locating small faults. The presence of both contacts enhances determination of the absence or presence of faulting.

Gardner et al. (1999) identified no mappable faults within the Bandelier Tuff at TA-55. The study identified a single-point location of 2 ft (0.61 m) down-to-the-north displacement on the Qbt2-Qbt3 contact, and that feature is situated near the 3000-ft envelope and at the edge of detailed geologic mapping performed by Seismic Hazards Geology Team personnel, seen on Figure 4 of this document. Identification of small displacement on a known gradational contact, its lack of lateral continuity, and no evidence of Holocene movement support the inconsequential nature of this single-point location in an assessment of surface rupture hazard. Post-Bandelier Tuff deposits are nearly absent at TA-55, having been in large part stripped away by modern building activities and replaced with fill. Olig et al. (1996) calculated a probabilistic displacement hazard for a principal trace of the Rendija Canyon fault near its southern end as 0.67 inches (1.7 cm) in 10,000 years. Gardner et al. (1999) therefore determined that the potential for seismic surface rupture at TA-55 has to be extremely low because virtually no deformation in the last 1.22 million years can be documented there.

Lavine et al. (2005) examined borehole logs and cores from geotechnical drilling studies performed at the site of the proposed Chemistry and Metallurgy Research Facility Replacement (CMRR) building at TA-55 to determine whether Tshirege Member contact elevations reveal any faulting at the site. The study resulted in three-dimensional models of a surface defined by the Qbt3-Qbt4 contact and identified no significant [e.g. expressing several feet (>1 m) of vertical displacement] faulting.

Investigations by the EES-9 Seismic Hazards Geology Team at the site of the CMRR excavation are currently underway. These investigations include detailed examinations of the Qbt3-Qbt4 contact, the undulating pyroclastic surge deposit separating the Tshirege Member subunits, and any fracturing or structures which might be present, as well as a high-precision total station survey of identified geologic features. The pyroclastic surge exhibits radical thickness changes over short distances. Units Qbt3 and Qbt4 are intensely fractured in places, with the fractures exhibiting variable amounts of vertical continuity and displacement across the pyroclastic surge in particular. The fractures are often curvilinear and frequently terminate at the contact with the pyroclastic surge. Minor faults with less than 2 ft (0.61 m) of vertical displacement across the pyroclastic surge are present, which may represent initial cooling and compaction of the tuff shortly after emplacement 1.22 million years ago. Field investigations and detailed analysis of the geologic features at the CMRR excavation, including interpretation of their relationship (if any) to the Rendija Canyon and Guaje Mountain faults, are slated for completion in February 2008.

IV.D. Surficial materials and structure at Pajarito Mesa, TA-67

Exploratory trenching and surficial geologic mapping were conducted along Pajarito Mesa (Figure 4) to evaluate the potential for surface faulting at a proposed Mixed Waste Disposal Facility (Kolbe et al., 1994; Reneau et al., 1995). Trenches totaling 4400 linear feet (1340 m) were excavated. These trenches exposed deposits of Bandelier Tuff and a robust post-Bandelier Tuff stratigraphy. These studies concluded that active faulting on that portion of Pajarito Mesa had been absent for at least the last 50-60 kyr. Other studies focusing on fractures along the south edge of Pajarito Mesa (Vaniman and Chipera, 1995) showed no zones of high or increasing fracture density, nor any zones of wide fracture opening, in the locations where the Rendija Canyon or Guaje Mountain faults were believed to cross the mesa.

IV.E. Fracture characteristics in a disposal pit on Mesita del Buey, TA-54

Reneau and Vaniman (1998) performed detailed total station surveys of Tshirege Member contacts on Mesita del Buey, approximately 1.1 miles (1.7 km) southeast of the proposed TRUWF (Figure 4), to assess the presence or absence of structure in support of contaminant transport studies. Their investigations found 37 faults with 0.1-2.1 ft (5-65 cm) of vertical displacement on surge deposits at the Qbt1v-Qbt2 contact (Figure 3) on the north wall of Pajarito Canyon. Faults in the western end of the surveyed area form two small grabens and exhibit the greatest amount of vertical displacement [3.2-6.5 ft (1-2 m) per fault on the surge between Qbt1v-Qbt2]. Faults mapped in this area have a wide range of orientations and sense of offset, and form numerous horst-and-graben structures. Reneau and Vaniman (1998) inferred that faults at TA-54 were associated with deformation during paleoseismic events on the Pajarito fault or even on more regional structures, and that the small faults at TA-54 likely do not represent a major, independent fault zone.

IV.F. Geology of the north-central to northeastern portion of LANL, TA-53

Geologic mapping and related field investigations, with the purpose of assessing seismic hazards in the north-central to northeastern portion of LANL including and surrounding TA-53, revealed only small faults that have little potential for seismic surface rupture (Lavine et al., 2003). These small faults lie east of the Pajarito fault system, show no clear connectivity to the Sawyer Canyon fault or other mapped or inferred structures, and likely represent subsidiary distributed faulting associated with earthquakes occurring on the Pajarito fault system.

V. EFFICACY OF FUTURE PALEOSEISMIC STUDIES AT SITE OF THE PROPOSED TA-52 TRUWF

The area of detailed geologic mapping by Lavine et al. (2003) and by the Seismic Hazards Geology Team (unpublished mapping) includes the footprint of the proposed TRUWF. The studies identified no laterally continuous geologic structures in the area. Geologic units exposed on the surface at the mesa top are primarily Qbt3, covered in some areas with thin colluvium (Figure 5). Qbt3 is at least 40 ft (~12 m) thick in this location. No post-Bandelier Tuff deposits were identified and recent field reconnaissance confirms the lack of significant post-Bandelier Tuff deposits in the area. Such deposits were never deposited, have been stripped by geomorphic processes over time, or have been removed by anthropogenic activities at the TA-52 site.

The absence of a robust sequence of post-Bandelier Tuff stratigraphy overlying Qbt3 in this location creates significant difficulty in embarking on future paleoseismic studies near the TRUWF footprint at TA-52. Without such units, the ability to identify paleoseismic events that postdate the deposition of the tuff (i.e. Holocene events) and to establish ages for identifiable paleoevents is essentially eliminated. Investigating the Qbt3-Qbt2 contact is not feasible as a trenching study. An alternative to shallow trenching would be to excavate or drill to the Qbt3-Qbt2 contact, which is at least 40 ft (~12 m) below the ground surface at the proposed TRUWF. A further complication to assessment of faulting using the Qbt3-Qbt2 contact, as opposed to using other Tshirege Member subunit contacts, is that the Qbt3-Qbt2 contact is marked by a gradational increase in welding downsection [over 1.5-3ft (0.5-1 m)] from nonwelded unit Qbt3 to moderately- to partially-welded unit Qbt2. The gradational nature of the Qbt3-Qbt2 contact limits its usefulness in identifying small-offset faults and establishes only an approximate offset on larger structures. Given this geologic dataset, identification of the presence of Holocene faults in the TA-52 area through trenching or drilling could not be definitively ascertained.

VI. CONCLUSIONS

Detailed geologic studies done at technical areas near TA-52 identified no evidence for significant, laterally continuous Holocene faulting near the proposed facility site. Trenches at TA-67 identified no active faults younger than 50-60 kyr. Fault studies at TA-53 showed subsidiary structures with very small offsets and small potential for surface rupture. Geologic investigations at TA-55 have thus far shown no evidence for Holocene faults; detailed fracture and fault analyses are currently ongoing in support of the CMRR facility with results forthcoming. A detailed total station survey at TA-54 recognized numerous small-offset faults that represent distributed hangingwall deformation from events on the principal Pajarito fault, but did not show independent Holocene movement. However, at TA-55 and TA-63, the post-Bandelier Tuff stratigraphy was thin to absent and therefore the presence of Holocene faults could not be absolutely confirmed or discounted. Generally, surface rupture potential is highest in close proximity to the major structures in the Pajarito fault system, those being the Pajarito, Rendija Canyon, and Guaje Mountain faults. Given the distal location of the proposed TRUWF to any mapped structures with demonstrable Holocene displacement, surface rupture potential appears quite low at TA-52. Additionally, two small-displacement [2 ft (0.61 m)] features were identified on the Qbt2-Qbt3 contact within the 3000-ft envelope surrounding the TA-52 facility (see Figure 5). The features were identified on a known gradational contact of two Bandelier Tuff subunits, meaning that uncertainty on any identified offsets is high. Additionally, the features lack lateral continuity, and no evidence was found demonstrating that offset on the features were generated as a result of a Holocene seismic event. This reaffirms the low potential for surface rupture at TA-52.

While the Pajarito and Rendija Canyon faults have been mapped in detail for their full along-strike distance in the vicinity of LANL, the southern end of the Guaje Mountain fault has not been mapped in detail. Although its defined surface expression ends at Bayo Canyon, displacements of Bandelier Tuff subunit contacts ~10 ft (~ 3 m) down-to-the-west were identified on the north side of Pueblo Canyon, approximately 1.75 miles (~2.8 km) north of the TA-52 site (Lavine and Schultz-Fellenz, unpublished mapping). The absolute location of the Guaje Mountain fault near the proposed TA-52 TRUWF, and its southernmost termination, are not known; however, detailed geologic studies in technical areas surrounding TA-52 (including TA-55, TA-63, TA-53, and TA-54) found no clear evidence of the Guaje Mountain fault in those areas. Geologic investigations near the TA-52 TRUWF site suggest that the potential for seismic surface rupture is likely to be extremely minimal.

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FIGURE CAPTIONS

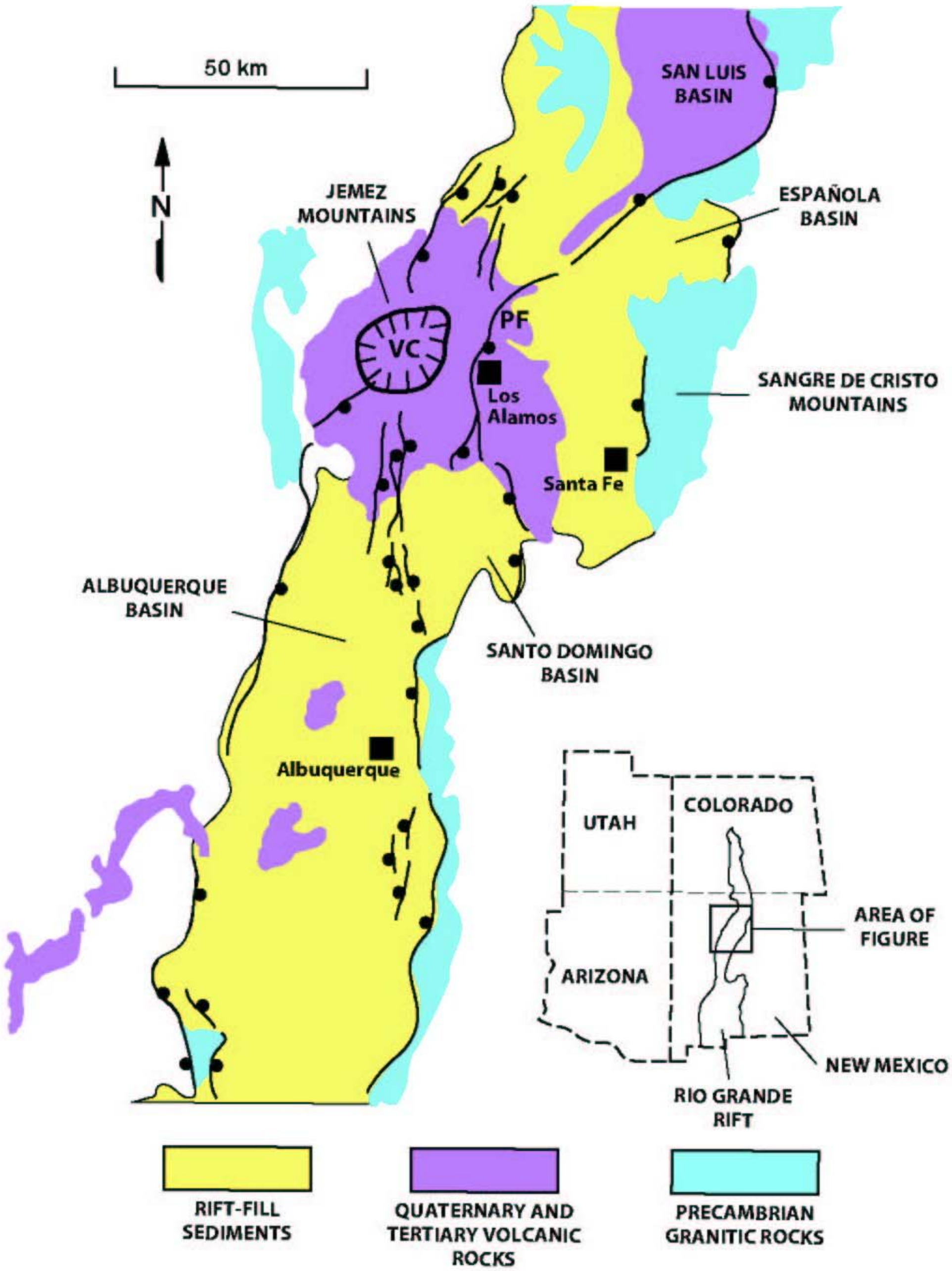
Figure 1. Map of the Rio Grande rift system in northern New Mexico. Major fault systems are shown schematically, with ball on downthrown block. PF = Pajarito fault. VC = Valles-Toledo caldera complex, source of the Quaternary-aged Bandelier Tuff. Modified from Gardner and Goff (1984).

Figure 2. Map of the Pajarito fault system in the vicinity of Los Alamos National Laboratory. Gray shaded area shows the area that has been mapped in detail to assess potential for faulting at LANL. Dark gray outline shows the extent of LANL. A red star indicates the site of the proposed TRUWF at TA-52. Faults and related folds shown in black are from Gardner and House (1987), Reneau et al. (1995), Gardner et al. (1999, 2001), Lewis et al. (2002), Lavine et al. (2003), Lewis et al. (in review) and Gardner and Reneau (unpublished mapping). Abbreviations: PF = Pajarito fault; RCF = Rendija Canyon fault; GMF = Guaje Mountain fault; SCF = Sawyer Canyon fault.

Figure 3. Generalized stratigraphy of the lower units of the Bandelier Tuff and Cerro Toledo interval exposed in the study area (from Lavine et al., 2003). Thickness of units is shown schematically and varies over the Pajarito Plateau. Unit Qbt2(+1vw) in the study area is equivalent to Qbt2 to the west (e.g., Gardner et al., 1999) and to unit Qbt2 and the upper part of Qbt1v-u to the east of the study area.

Figure 4. Pajarito fault system structural map, with emphasis on subsidiary structures associated with the system. The Pajarito fault system includes the down-to-the-west Rendija Canyon (RCF), Guaje Mountain (GMF), and Sawyer Canyon (SCF) faults, as well as the master down-to-the-east Pajarito fault (PF). Faults and related folds shown in black. TA-52 labeled in red. Other site-specific geologic studies conducted at LANL and discussed in Section 4 are labeled in green by technical area. Modified from Gardner et al. (2003).

Figure 5. Localized geologic map of the TA-52 area, including 200-ft and 3000-ft standoffs per 40 CFR 264. Colored polygons represent different mapped geologic units (refer to Figure 3 for Bandelier Tuff stratigraphic nomenclature). Red lines represent faults; red dots represent identified displacements on Bandelier Tuff subunit contacts with no observed continuity. Numbers and letters associated with red dots and lines indicate amount and sense of observed displacement (e.g. 2 DTN = 2 ft down-to-the-north). Geologic and structural mapping from Gardner et al. (1999), Lavine et al. (2003), and Seismic Hazards Geology Team (unpublished mapping).



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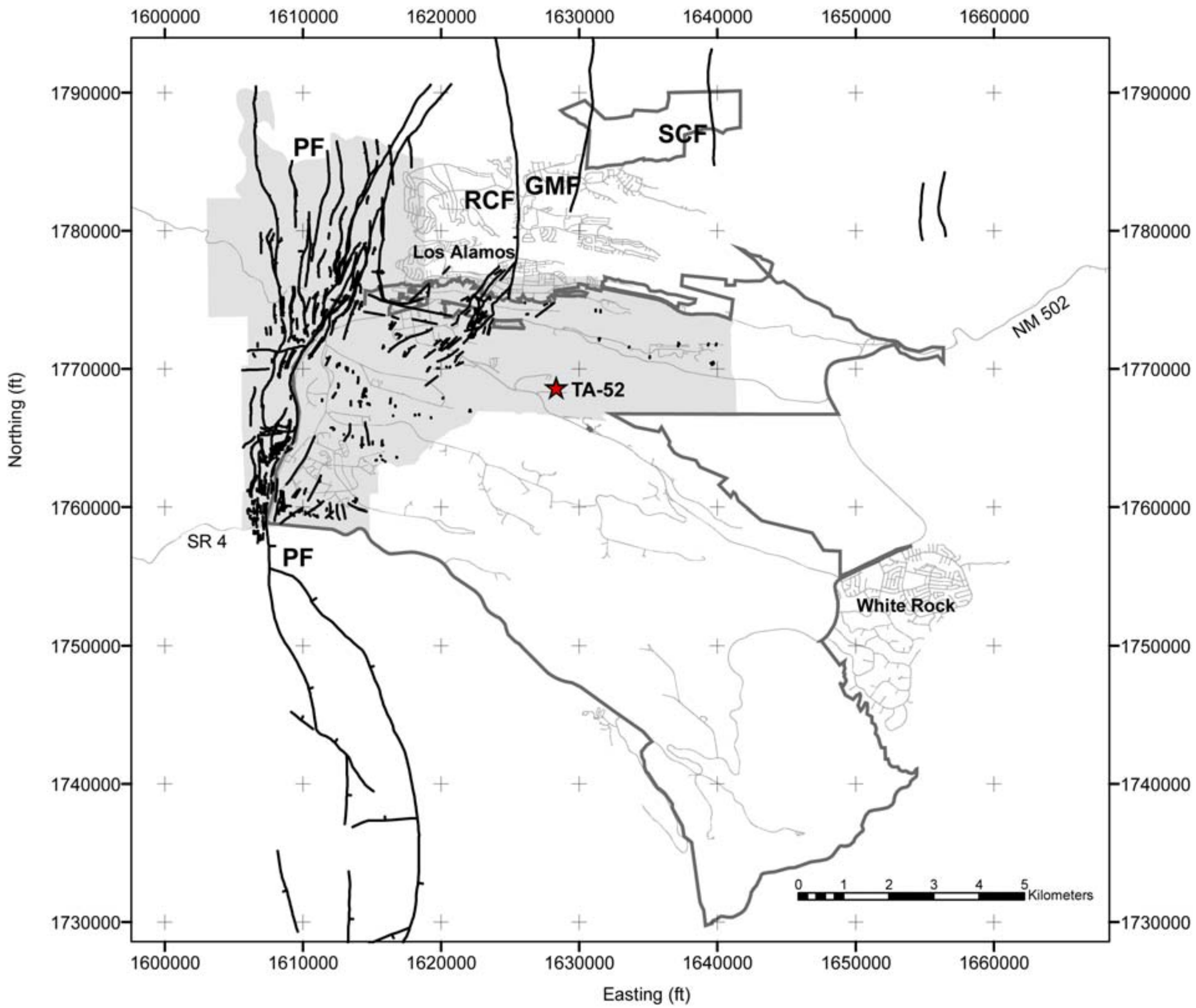

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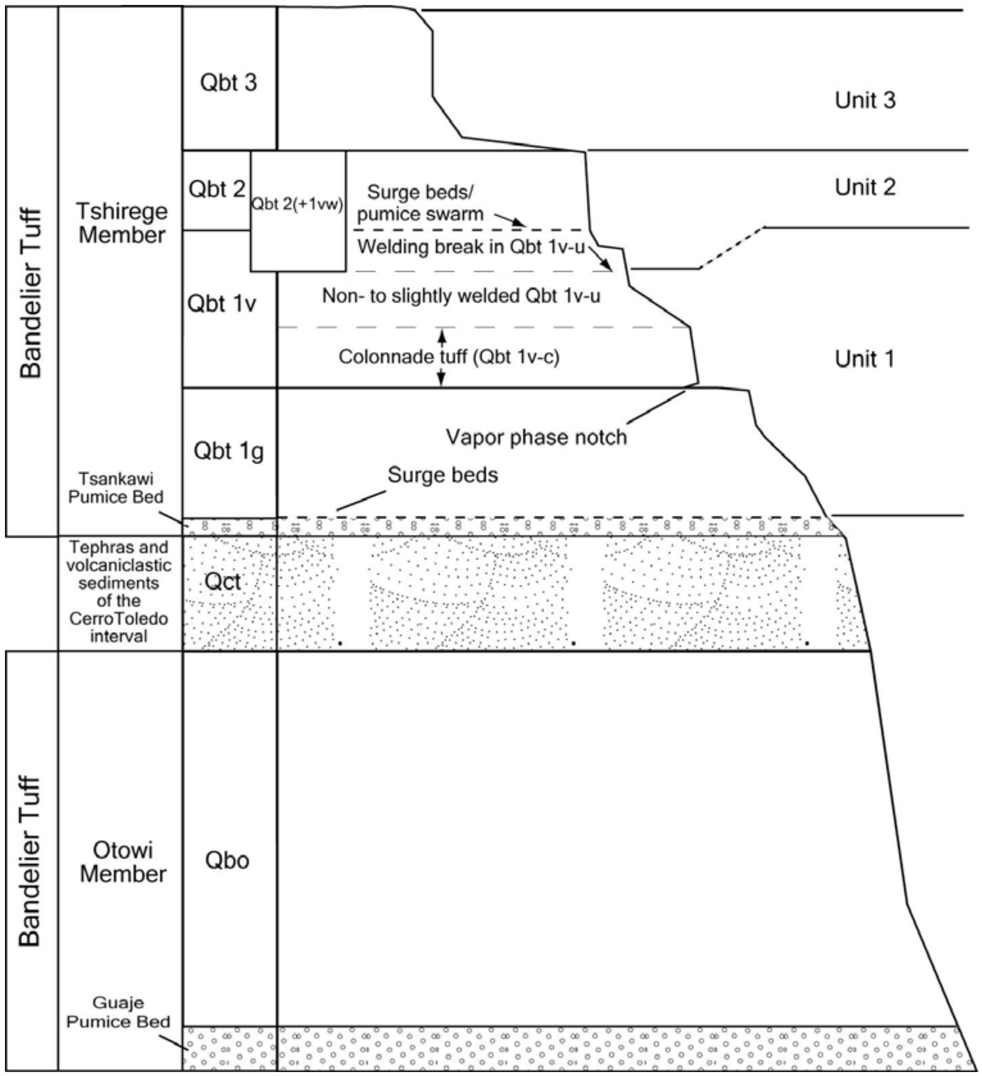

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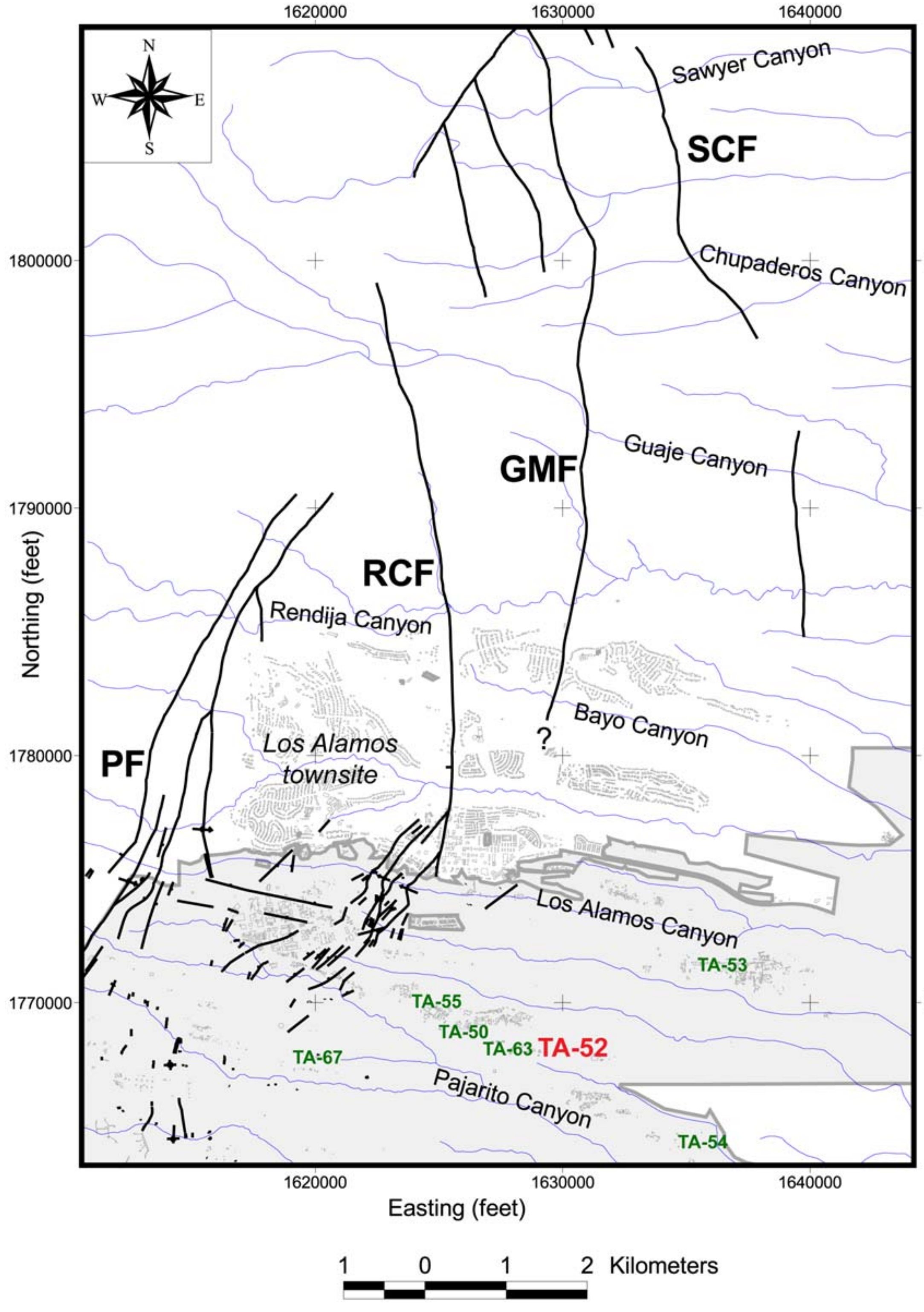

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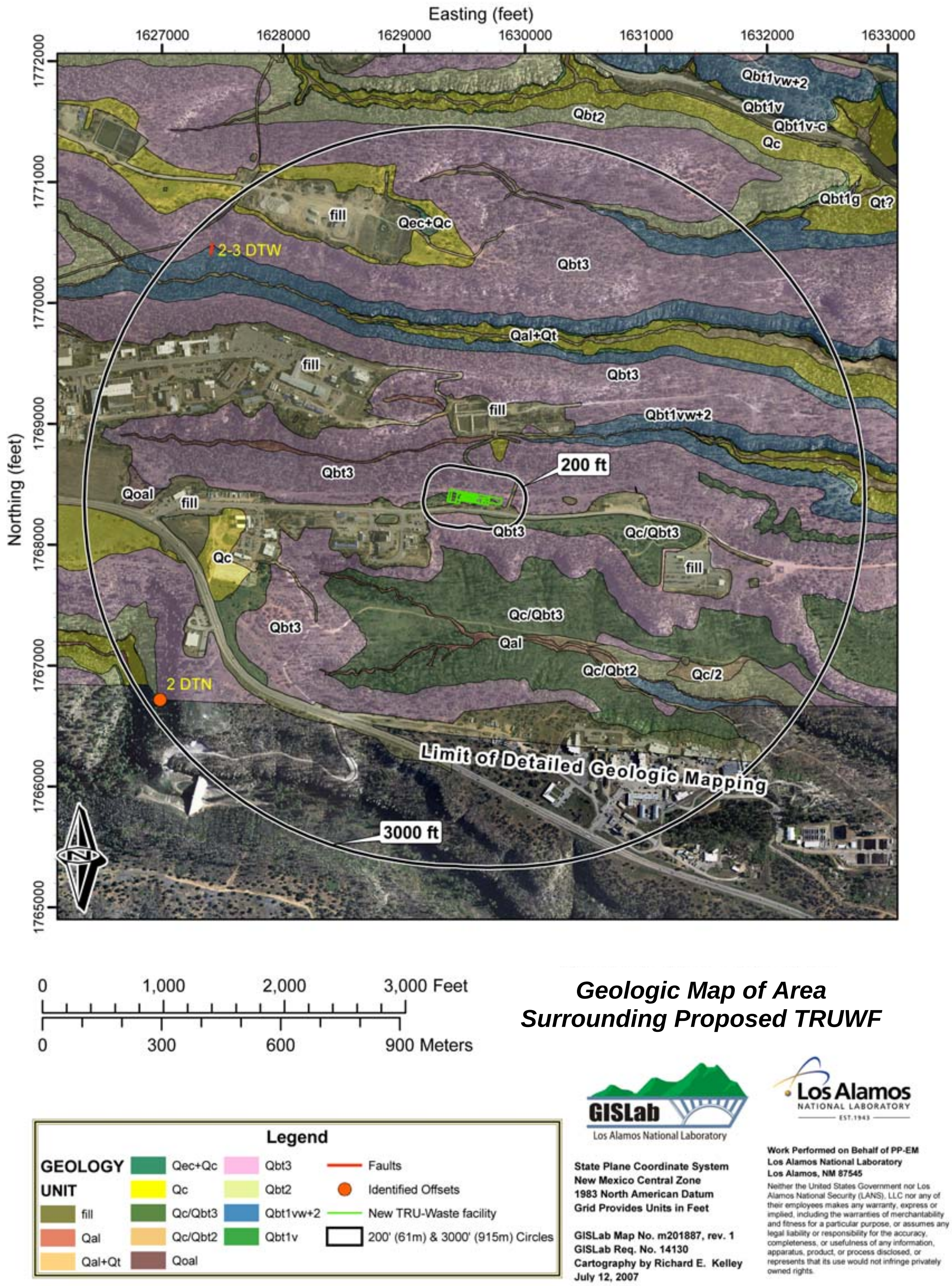

Schultz-Fellenz and Gardner, Figure 5.

APPENDIX B

WASTE ANALYSIS PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AK	acceptable knowledge
ALARA	as low as reasonably achievable
ASTM	American Society for Testing and Materials
CBFO	Carlsbad Field Office
CCP	Centralized Characterization Project
CFR	Code of Federal Regulations
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFCO	Federal Facilities Compliance Order
HE	high explosives
HEPA	high-efficiency particulate air
ITRI	Inhalation Toxicology Research Institute
LANL	Los Alamos National Laboratory
LDR	Land Disposal Restrictions
MLLW	mixed low-level waste(s)
MTRUW	mixed transuranic waste(s)
NCR	non-conformance report
NNSA	National Nuclear Security Administration
ppm	parts per million
ppmw	parts per million by weight
Pu-238	plutonium-238

LIST OF ABBREVIATIONS/ACRONYMS (Continued)

QA	quality assurance
QAPjP	"Los Alamos National Laboratory Transuranic Waste Quality Assurance Project Plan"
QC	quality control
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RTL	regulatory threshold limit
RTR	real-time radiography
SOP	standard operating procedure
SVOC	semivolatile organic compound
STP	Site Treatment Plan
SW-846	EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"
TA	technical area
TC	toxicity characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TRU	transuranic
TRUWF	Transuranic Waste Facility
TSDF	treatment, storage, and disposal facility
UHC	underlying hazardous constituents
VO	volatile organic
VOC	volatile organic compound
WAC	waste acceptance criteria
WAP	waste analysis plan

LIST OF ABBREVIATIONS/ACRONYMS (Continued)

WIPP	Waste Isolation Pilot Plant
WIPP WAC	“Waste Acceptance Criteria for the Waste Isolation Pilot Plant”
WMC	Waste Matrix Code(s)

APPENDIX B
WASTE ANALYSIS PLAN

This Waste Analysis Plan (WAP) presents information on and describes the sampling and characterization procedures used to determine the chemical and physical nature of hazardous waste, the hazardous component of mixed low-level waste (MLLW), and the hazardous component of mixed transuranic waste (MTRUW) stored at Los Alamos National Laboratory (LANL). This information is being presented to support the permit modification request for the addition of the Transuranic Waste Facility (TRUWF). This appendix has been written to encompass general waste characterization processes at LANL as they will be applied at the facility; however, where applicable, the information has been limited to the waste management unit within the TRUWF. It has been prepared to meet the requirements set forth in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) incorporating Title 40 of the Code of Federal Regulations (CFR), § 264.13, revised October 1, 2003[10-01-03]. The waste analysis information contained in this WAP is used for characterization of wastes managed in containers. Waste characterization processes for other treatment methods conducted at LANL have been included in the most recent revision of the LANL General Part B Permit Application (LANL, 2003), hereinafter referred to as the LANL General Part B. Additional waste analysis requirements are specified in 20.4.1 NMAC § 270.14(b), and 20.4.1 NMAC § 268.7 [10-01-03]. The content of this WAP follows the guidance provided in "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual" (U.S. Environmental Protection Agency [EPA], 1994). It is organized as follows:

Section B.1 Facility Description: Includes a general description of LANL, general descriptions of the waste streams stored and treated, and the activities that generate waste at LANL.

Section B.2 Waste Analysis Parameters: Includes a discussion of the proposed analytical parameters and methods used by LANL for storage of waste and the criteria/rationale for the parameter selection.

Section B.3 Characterization Procedures: Includes the characterization approach (e.g., acceptable knowledge, sampling and analysis) for each waste classification stored at LANL.

Section B.4 Off-Site Waste: Includes a discussion of procedures in place for acceptance of waste from off-site facilities.

Section B.5 Special Procedural Requirements: Includes a discussion of the procedures in place for ignitable, reactive, and incompatible wastes; procedures to ensure compliance with land disposal restrictions (LDR); and procedures to ensure compliance with Subpart BB and CC requirements.

Section B.6 References.

Table B-1 summarizes applicable regulatory requirements and the corresponding location where the requirement is addressed in this appendix.

Throughout this document, generator waste characterization is described as the preliminary source of information at LANL determining the identification and subsequent management of the waste. Generator waste characterization requirements are addressed in 20.4.1 NMAC, Subpart III, Part 262, and the information included in this permit modification package is not intended to result in hazardous waste facility permit conditions being applied to the waste-generation process or the procedures covered by that regulation. The information presented is intended to discuss how the waste characterization data are reviewed and used by LANL waste management units and organizations in compliance with the 20.4.1 NMAC, Subpart V, Part 264, and 20.4.1 NMAC, Subpart VIII, Part 268, regulatory requirements.

B.1 FACILITY DESCRIPTION [20.4.1 NMAC § 270.14(b)(1)]

LANL is located in Los Alamos County in north-central New Mexico. It is approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. LANL and the associated residential and commercial areas of Los Alamos County are situated on the Pajarito Plateau. A detailed description of the LANL facility is included in Appendix A of the most recent version of the LANL General Part B Permit Application (LANL, 2003) and a detailed description of the TRUWF is included in Appendix A of this permit modification request.

LANL's central mission is the reduction of global nuclear danger supported by research that also contributes to conventional defense, civilian, and industrial needs. This includes programs in nuclear, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine, health, and biotechnology; and industrial partnerships. LANL is owned by the National

Nuclear Security Administration of the U.S. Department of Energy (DOE-NNSA) and is operated jointly by DOE-NNSA and the Los Alamos National Security, LLC.

B.1.1 Facility Waste-Generating Processes and Activities

Wastes are generated at LANL primarily from research and development (R&D) activities, processing and recovery operations, decontamination and decommissioning (D&D) projects, and corrective action activities. Waste stream descriptions provide information on the most common waste streams and their generation processes. These descriptions are not intended to be inclusive of every current or future waste stream or waste generation process at LANL. In any event, additional EPA Hazardous Waste Numbers will be added to the future Technical Area (TA) 52 section of the of the most recent version of the "Los Alamos National Laboratory General Part A Permit Application." That information presents waste descriptions potentially generated at LANL. Tables B-2 through B-5 present information on hazardous wastes, MLLW, and MTRUW generated, stored, managed at LANL and ultimately disposed at off-site facilities. Wastes generated from these types of processes and activities may also be received from off-site facilities, as described in Supplement 1 of the most recent General Part B (LANL, 2003). Wastes generated at off-site facilities that may be received at LANL are described in Table B-6. These tables include brief waste descriptions, waste-generating process or activity, the characterization basis for waste designation, potential EPA Hazardous Waste Number(s), the hazardous constituent(s) listed in Appendix VIII of 20.4.1 NMAC, Subpart V, and/or the characteristic(s) defined at 20.4.1 NMAC, Subpart V, Part 264, Subpart C, that make the waste hazardous, and the regulatory limits, as appropriate. These tables are provided for information purposes only.

B.1.2 Stored Waste

Hazardous waste, MLLW, and MTRUW are stored at various container storage units throughout LANL. The following sections contain general descriptions of these wastes and the processes that generate them.

B.1.2.1 Hazardous Waste

The criteria for establishing a waste as a hazardous waste are provided in 20.4.1 NMAC, Subpart II [10-01-03]. A waste is considered hazardous if it meets the definition of a solid waste described in 20.4.1 NMAC § 261.2 [10-01-03]; is not exempted from regulation as a hazardous waste under 20.4.1 NMAC § 261.4 [10-01-03]; and exhibits any of the characteristics of hazardous waste identified in 20.4.1 NMAC, Subpart II, Part 261, Subpart C, or is listed in 20.4.1 NMAC, Subpart II, Part 261, Subpart D [10-01-03].

Hazardous wastes are generated at LANL primarily from R&D activities, general facility operations, D&D projects, and corrective action activities. These waste streams include spent solvents, contaminated solid wastes, paint and related wastes, photographic and photocopier wastes, corrosive liquids, solid metals and metallic compounds, contaminated noncorrosive aqueous and nonaqueous solutions and sludges, mercury wastes, used batteries and battery fluids, unused off-specification commercial chemical products, gas cylinder waste, asbestos, inorganics, organics, high explosives (HE), PCBs, corrective action soils and sludges, corrective action aqueous liquids, and corrective action debris. Hazardous waste matching some of these waste stream descriptions may also require management at the TRUWF as a result of segregation of waste items from MTRUW waste streams and from recharacterization of items as hazardous only based upon certification procedures and radioanalysis. Hazardous waste streams may be of uniform physical composition (i.e., homogeneous) or of dissimilar/diverse composition (i.e., heterogeneous). Homogeneous waste is defined as waste that contains only one material or substance or waste that has its components mixed so that consistent samples can be drawn throughout. Homogeneous waste streams can be either solids or liquids. Heterogeneous waste is defined as waste that contains multiple components that are separate because of density or specific gravity, are located in different places within the mixture, or are discrete and different articles. Heterogeneous wastes (e.g., debris) do not lend themselves to representative sampling and analysis. Descriptions of these routinely handled hazardous waste streams and their waste-generating processes are provided below and summarized in Table B-2.

Spent Solvents

This waste stream consists of spent solvents and spent solvent mixtures that may contain organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include R&D, laser research, organic and inorganic chemistry research, cleaning, and degreasing.

Contaminated Solid Wastes

Contaminated solid wastes (i.e., wastes of a solid physical form) include mixtures of rags, spill cleanup materials, wipes, gloves, filters, plastic and paper products, and personal protective equipment. This waste stream may also consist of disposable equipment contaminated with organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include machining operations, chemistry research, D&D projects, metal finishing operations, and general maintenance operations.

Paint and Related Wastes

Paint and paint-related wastes consist of excess paint, paint strippers/thinners, and sludges of paints and thinners. Possible contaminants include heavy metals used as paint pigments and solvents contained in thinners and lacquers. Waste-generating activities include painting and finishing operations and general facility maintenance.

Photographic and Photocopier Wastes

Photographic wastes include spent or excess film developers, fixer solutions, and bleach/etching solutions that may be contaminated with heavy metals. Photocopier wastes include kerosene-based toners and dispersants. This waste stream is generated from photographic film processing and photocopier operations.

Corrosive Liquid Wastes

These wastes consist of acidic or alkaline solutions that may contain organics, inorganics, metals, oils, and other contaminants. Waste-generating activities include analytical chemistry research, electro-etching, and electro-polishing.

Solid Metals and Metallic Compounds

This waste stream consists of metal chips and turnings from machining and cutting operations. It also consists of metal powders; metal salts; metal sheets; reactive metals used in synthesis reactions; solders from electronic manufacturing, repair, and brazing operations; and grinding operations. Other solid metals and metallic compounds include lead shot, bricks, plate, and shielding.

Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges

This waste stream consists of noncorrosive aqueous and nonaqueous solutions and sludges that are contaminated with hazardous wastes or hazardous residues. Waste-generating activities include vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research.

Mercury Wastes

Mercury wastes include free elemental mercury, mercuric compounds, articles and instruments containing mercury, fluorescent light fixtures, and gels containing mercuric compounds. Waste-generating activities include lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance.

Used Batteries and Battery Fluids

This waste stream consists of used batteries and battery fluids that contain heavy metals such as cadmium, lead, mercury, and silver. Waste-generating activities include routine equipment maintenance.

Unused/Off-specification Commercial Chemical Products

This waste stream consists of discarded solid and liquid chemical reagents that are off-specification, unused, or outdated. This waste stream also includes spill residues and containers containing original product residues that are unused.

Gas Cylinder Waste

This waste stream consists of pressurized gas cylinders, including aerosol cans, which may contain regulated hazardous metals, organic compounds, or exhibit the hazardous characteristics of ignitability, corrosivity, and reactivity.

Soils/Environmental Media and Sludges

This waste stream consists of environmental media and sludges generated through corrective action and D&D activities, including site decommissioning, site characterization, and site remediation. Waste-generating activities include septic tank and detention basin closure, removal actions, and other remedial actions and site closures.

Aqueous Liquids

This waste stream consists of liquids generated during corrective action and D&D activities, including decontamination of remedial equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated stormwater runoff.

Debris

This waste stream consists of debris (such as asphalt, concrete, vitrified clay/cast iron pipe, steel baffles, and building materials) generated through corrective action and D&D activities, including site decommissioning, site characterization, and site remediation. Waste-generating activities include septic tank and detention basin closure, removal actions, and other remedial actions and site closures.

B.1.2.2 Mixed Low-Level Waste

Low-level waste is defined in DOE Order 435.1, "Radioactive Waste Management" (DOE, 1999), as "Radioactive waste that is not classified as high-level waste, spent nuclear fuel, transuranic waste, by-product material [as defined in Section 11(e)(2) of the *Atomic Energy Act,* as amended], or naturally occurring radioactive material". MLLW is any waste that has both a hazardous waste component and a low-level waste component, as defined above. For MLLW, this WAP addresses only the hazardous component.

MLLW is generated at LANL primarily from R&D activities, processing and recovery operations, D&D projects, and corrective action activities. MLLW matching these waste stream descriptions may also require management at the TRUWF as a result of segregation of waste items from MTRUW waste streams and from recharacterization of items as MLLW based upon certification procedures and radioanalysis. MLLW streams may be homogeneous or heterogeneous, as defined in Section B.1.2.1. Descriptions of the MLLW and their waste-generating processes are provided below and summarized in Table B-3. These descriptions are extracted primarily from LANL's "Report for the Characterization Review of Low-Level Mixed Waste" (LANL, 1995a) and "Federal Facilities Compliance Order Site Treatment Plan Background Volume" (LANL, 1995b).

Contaminated Soils

Soil waste contaminated with heavy metals is generated during D&D and corrective action activities at various locations throughout LANL.

Inorganic Oxidizers

Discarded reagent powders and crystalline materials comprise this waste stream. Most of these items are in the original manufacturer's containers, some of which may be hydrated. Many of these containers are unopened but are suspected to have radioactive surface contamination. Waste-generating activities include D&D of research laboratories and R&D.

Lead Waste

Lead waste consists of contaminated and activated lead shielding used as radiation shielding, inseparable lead, lead blankets, and lead requiring sorting. It is generated primarily from radioisotope experiments and other reactor, accelerator, laser, and x-ray activities. The lead may be in the form of sheets, pigs, bricks, shot, shavings, slag, dross, and other shapes. Radioactive contamination on the surface of the lead may be removable and the lead can then be recycled or reused.

Noncombustible Debris

Noncombustible debris consists of discarded hazardous and contaminated scrap metals that are generated by maintenance, D&D of research laboratories or equipment, R&D, and corrective action activities. Additionally, discarded bricks and glass are generated through dismantling of LANL buildings, including plating shops and machine sheds. The waste may be considered hazardous due to the metal content or by virtue of contamination during use.

Combustible Debris

Maintenance, D&D, R&D, and corrective action activities generate rags and combustible debris with heavy metals and/or organics, some of which contain residual liquids. Examples include solvents and lubricants that are used in metal-cutting operations. Much of this waste is generated during the processing of lead and barium, resulting in heavy metal contamination.

Organic-Contaminated Noncombustible Solids

This waste stream includes absorbed organic chemicals, laboratory trash, and discarded equipment. Absorbed organic chemical waste is comprised of drums containing vermiculite or other inorganic sorbents used to absorb chemicals from spills and routine maintenance operations.

Laboratory trash consists of noncombustible solid materials with organic contamination. The laboratory debris includes reagent bottles, broken glassware, and disposable lab ware. Large quantities of chemicals are not placed in this trash; however, residual liquids or powders may have remained on some of the discarded material.

Discarded equipment with heavy metals and solvents primarily includes equipment and broken glassware that may have contained residual solvents.

Organic-Contaminated Combustible Solids

This waste stream consists of waste similar to combustible debris waste, along with rags, cardboard, protective clothing, and paint-stripper trash. This waste stream is potentially contaminated with methyl ethyl ketone and other solvents. Waste-generating activities include maintenance, D&D, and corrective action activities.

Water-Reactive Wastes

Water-reactive wastes consist of reactive metal debris generated through the cleanup of HE firing-site debris and from machining and disassembly of test components. This waste stream includes calcium, lithium hydride, lithium metal, and magnesium.

Mercury Wastes

This waste stream includes elemental mercury and mercury-contaminated instruments and equipment waste stream that consist of discarded or broken equipment containing liquid mercury. The instruments and equipment include broken thermometers, vacuum tubes, vacuum pumps with residual mercury, activated or contaminated fluorescent light bulbs, and mercury absorbed into a paper or solid matrix. Most of this waste is generated by cleanup operations and could not effectively be recycled or separated from its containing vessel.

Spent Solvents and Contaminated Solvent Mixtures

This waste stream is comprised of spent solvents and spent solvent mixtures that contain organic or inorganic compounds, heavy metals, oils, and/or other contaminants. Waste-generating activities include a wide variety of maintenance, cleaning and degreasing, R&D, and processing operations, such as extraction, bench-scale experimental inorganic chemistry, environmental analysis, and radiochemistry.

Corrosive Liquid Wastes

This waste stream consists of acidic or alkaline solutions that contain organics, inorganics, metals, oils, and/or other contaminants. Waste-generating activities include radiochemistry research, plutonium processing, and analytical chemistry.

Liquids Contaminated with Heavy Metals and/or Organics

This waste stream consists of aqueous and nonaqueous solutions that contain heavy metals and/or organics. Waste-generating activities include metal-polishing operations, radiochemistry research, and corrective action activities.

Oil Wastes

Oil wastes at LANL are generated during equipment maintenance operations. Possible contaminants in this waste stream include heavy metals and solvents.

Unused Reagent Chemical Wastes

Many different types of discarded off-specification unused solid and liquid reagent chemical wastes are generated at LANL by R&D programs. Most of these items are in their original containers.

Gas Cylinder Waste

This waste stream consists of pressurized gas cylinders, including aerosol cans, which contain regulated hazardous metals, organic compounds, or exhibit the hazardous characteristics of ignitability, corrosivity, and reactivity.

B.1.2.3 Mixed Transuranic Waste

Transuranic (TRU) waste is defined in DOE Order 435.1, "Radioactive Waste Management" (DOE, 1999), as follows: "Radioactive waste containing more than 100 nanocuries (3700 becquerels) per gram of waste, with half-lives greater than 20 years." Transuranic isotopes are those with atomic numbers greater than 92. MTRUW contains both a hazardous waste component and a TRU waste component. For MTRUW, this WAP addresses only the hazardous component. The system of MTRUW stream descriptions presented below is consistent with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit. This information may be superseded by any changes to the "Waste Acceptance Criteria for the Waste Isolation Pilot Plant" (WIPP WAC).

MTRUW is generated at LANL primarily from R&D activities, processing and recovery operations, and D&D projects. Limited quantities of MTRUW from off-site facilities will be accepted at LANL for additional characterization and management. MTRUW streams at LANL include four broad categories that can be described by a Summary Category Group, which is further subdivided into Waste Matrix Codes (WMC). Summary Category Groups are used to define waste characterization groupings for the "Federal Facility Compliance Order (Los Alamos National Laboratory)" (New Mexico Environment Department [NMED], 1995) requirements and are based on the physical and chemical forms of the waste. Complete descriptions of the Summary Category Groups are available in "DOE Waste Treatability Groups Guidance" (DOE, 1995). The Summary Category Groups that are applicable to the MTRUW stored and, in some cases, treated at LANL are listed below.

- *Summary Category Group S3000, Homogeneous Solids*: defined as solid waste materials, excluding soil/gravel, that do not meet the EPA LDR criteria for classification as debris.
- *Summary Category Group S4000, Soil/Gravel*: defined as solid waste materials that are at least 50 percent by volume soil/gravel.
- *Summary Category Group S5000, Debris*: defined as a heterogeneous waste stream that is at least 50 percent by volume solid materials exceeding a 2.36-inch particle size that is intended for disposal and is a manufactured object, plant or animal matter, or natural geologic material. Particle sizes smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.
- *Summary Category Group L1000, Aqueous Liquids/Slurries*: defined as aqueous liquids and slurries that meet the EPA LDR criteria for wastewaters (i.e., <1 percent total suspended solids).

Summary Category Groups are applied to MTRUW streams as a general categorization scheme to distinguish between waste types. More specific waste identification systems (i.e., WMC and LANL TRU Waste Stream identification (ID) numbers) are used for supplementary purposes as part of waste management operations at LANL. The WMCs that are applicable to the solid MTRUW stored at LANL are:

- *WMC S3100, Inorganic Homogeneous Solid Waste*: includes mixed inorganic homogeneous waste (cemented inorganics, organics on vermiculite, non-cemented, salts, and cemented organics).

- *WMC S5300, Organic Debris Waste*: consists of mixed combustible debris waste (plastic, cellulosics, and rubber).

- *WMC S5400, Heterogeneous Debris Waste*: includes mixed heterogeneous debris waste (varying amounts of combustible and noncombustible debris, with a small amount of homogeneous waste present).

Solid MTRUW is assigned a WMC and is further identified with a LANL TRU Waste Stream ID number. Using the WMC, waste streams are further delineated based on the following prioritized criteria: waste-generating process (to the degree to which waste has been segregated by process); Summary Category Group (i.e., homogeneous or debris waste); waste matrix; and hazardous chemical content (i.e., organics and/or inorganics). The following are general MTRUW stream descriptions:

- Homogeneous Inorganic, Cemented: includes solidified aqueous or homogeneous inorganic solids, solidified inorganic process solids, leached process residues, evaporator bottoms/salts, and/or cement paste.

- Homogeneous Inorganic, Cemented Organics: major portion of the waste is cement (i.e., inorganic) containing a minor portion of cemented solidified organic process solids.

- Homogeneous Inorganic, Non-cemented: includes solid (non-cemented) inorganic waste, ash, dewatered aqueous sludge, and/or chemical treatment sludge.

- Homogeneous Inorganic, Salts: includes pyrochemical, nitrate, and/or chloride salts; hydroxide cake; and/or other salt waste.

- Homogeneous Inorganic, Vermiculite: includes vermiculite-absorbed hydrocarbon oil, vermiculite-absorbed silicon-based liquid, and solidified (non-cemented) organic waste.

- Soil: includes all radioactive-contaminated soil.

- Combustible debris: includes greater than 50% by volume combustible decontamination waste, cellulosics, plastics, rubber, laboratory trash, building debris, hot cell waste, and/or other combustibles.

- Heterogeneous debris: includes greater than 50% by volume noncombustible waste, metal scrap, glass, metal waste, metal crucibles and dies, precious metals, filter media and residue, beryllium-contaminated debris, ion-exchange resins, irradiation sources, firing point sources, leaded rubber, graphite waste, high-efficiency particulate air (HEPA) filter waste, skull and oxide, slag and porcelain, and/or other noncombustible waste.

The WMCs correspond to other historical and current waste identification systems used at LANL. Table B-4 lists the MTRUW streams stored at LANL by their Summary Category Group, WMC, and general matrix description, and provides a cross-reference between past and present waste identification systems.

LANL TRU Waste Stream ID numbers are applied to the MTRUW streams described above. LANL TRU Waste Stream ID numbers are assigned the prefix "LA-", followed by a unique identifier that further delineates the waste stream. The following paragraphs provide examples of the delineated waste streams for the MTRUW stored and, in some cases, treated at LANL. MTRUW information is summarized in Table B-5.

LA-TA-55-19: Mixed Combustible Debris Waste

This waste stream consists of mixed combustible debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The debris waste includes paper, rags, plastic, rubber, wood-based HEPA filters, and other plastic-based and cellulose-based items.

LA-TA-55-30: Mixed Heterogeneous Debris Waste

This waste stream consists of mixed heterogeneous debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste includes plutonium-contaminated noncombustible and combustible debris waste.

LA-MIN01-CIN: Mixed Inorganic Homogeneous Waste, Cemented Inorganics

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, facility and equipment operations and maintenance, and liquid waste treatment operations. The waste includes cemented sludge, solidified aqueous waste, and solidified inorganic process solids.

LA-MIN02-V: Mixed Inorganic Homogeneous Waste, Organics on Vermiculite

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste is comprised of organic liquids (oils and solvents) adsorbed on vermiculite.

LA-MIN03-NC: Mixed Inorganic Homogeneous Waste, Non-cemented

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and liquid waste treatment operations. It consists of vacuum filter cake solid waste.

LA-MIN04-S: Mixed Inorganic Homogeneous Waste, Salts

This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. It is comprised of non-cemented inorganic process solids (salts).

LA-MIN05-COR: Mixed Inorganic Homogeneous Waste, Cemented Organics

This waste stream consists of mixed inorganic homogeneous solidified (cemented) organic process solids and emulsified solvents and oils generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance.

LA-MHD02-238: Mixed Heterogeneous Debris Waste, Pu-238

This waste stream consists of mixed heterogeneous debris waste generated by plutonium-238 (Pu-238) processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance. The waste includes Pu-238 contaminated noncombustible and combustible debris waste.

LA-MIN06-C238: Mixed Inorganic Homogeneous Waste, Cemented Inorganics, Pu-238

This waste stream consists of mixed inorganic homogeneous waste comprised of solidified (cemented) inorganic process solids. This waste stream is generated by Pu-238 processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance.

LA-MHD03-DD: Mixed Heterogeneous Debris Waste, D&D

This waste stream consists of mixed heterogeneous debris waste generated from facility and equipment D&D, including associated sectioning, size reduction, and packaging operations. The waste is comprised of plutonium-contaminated noncombustible and combustible debris waste.

LA-MHD05-ITRI: Mixed Heterogeneous Debris Waste, Inhalation Toxicology Research Institute

This waste stream consists of mixed heterogeneous debris generated between 1975 and 1984 by the Inhalation Toxicology Research Institute (ITRI), which is currently operated by Lovelace at the Kirtland Air Force Base, New Mexico. The waste is comprised of laboratory waste that may contain rags, tools, and biological waste contaminated with plutonium-239.

LA-MHD07-SNL: Mixed Heterogeneous Debris Waste, Sandia National Laboratory

This waste stream consists of mixed heterogeneous debris waste generated by Sandia National Laboratories. This waste stream may contain lead (D008).

LA-MHD04-RH: Mixed Heterogeneous Debris Waste, Remote-Handled

This waste stream consists of mixed remote-handled heterogeneous debris waste generated by hot cell operations. This waste is comprised of combustible and noncombustible waste.

Sandia National Laboratories/New Mexico - Generated Waste

MTRUW managed at Sandia National Laboratories/New Mexico will be received and stored at LANL for waste certification purposes prior to subsequent reshipment for final disposition. The waste stream consists of combustible and noncombustible debris and may include metals, cellulosics, rubber, plastics, organic matrices, and inorganic materials (see Table B-6).

B.1.3 Treated Wastes

Containerized waste will be prepared and certified for shipment at the TA-52 TRUWF. As part of this procedure, the waste in the containers may need to be treated for transport to and to meet waste acceptance criteria for the WIPP or other off-site facilities. Treatment methods that will be used at the TRUWF will include absorption, neutralization, cementing or grouting to solidify liquid containing wastes, and the puncturing of aerosol cans. The most common treatment method anticipated is absorption of liquids in the containers. Further discussion regarding these treatment methods is contained in Appendix G of this document. Characterization of the treated wastes will occur in accordance with this plan. Waste treatment methods that are not conducted at the TRUWF, but are conducted at other units at LANL (e.g. open burning and open detonation), are covered in Appendix B of the most recent version of the LANL General Part B (LANL, 2003).

B.2 WASTE ANALYSIS PARAMETERS [20.4.1 NMAC § 264.13(A)(1)]

Detailed chemical and physical characterization will be performed on hazardous wastes, the hazardous component of MLLW, the hazardous component of MTRUW, HE wastes, and HE-contaminated wastes for management purposes, as required by 20.4.1 NMAC § 264.13. As necessary, the waste analysis parameters will be selected to ensure that the waste characterization documentation will contain the information necessary to properly manage the waste in accordance with Resource Conservation and Recovery Act (RCRA) general facility standards in 20.4.1 NMAC, Subpart V, Part 264, and LDR requirements in 20.4.1 NMAC, Subpart VIII, Part 268.

B.2.1 Proposed Analytical Parameters and Methods [20.4.1 NMAC § 264.13(b)(1), and 20.4.1 NMAC § 270.14(b)(2)]

Analytical parameters and characterization methods that will be used for hazardous wastes, MLLW, and MTRUW generated at LANL are summarized in Tables B-7 through B-9. The parameters listed below will be used, as necessary, to determine the RCRA regulatory status of the wastes listed in Section B.1.

- Acceptable Knowledge (AK)
- Sampling and analysis to determine the presence and concentrations of:
  - RCRA-regulated metals
  - RCRA-regulated volatile organic compounds (VOC)
  - RCRA-regulated semivolatile organic compounds (SVOC)
- MTRUW characterization sampling methods
  - Headspace gas sampling to determine the presence of VOCs in container headspace
  - Physical waste form characterization through real-time radiography (RTR) and/or visual examination to verify the absence of prohibited items (e.g., liquids and sealed >4 liter containers).
- Flash point characterization
- pH characterization
- Reactivity characterization
- Additional characterization data

B.2.2 Criteria and Rationale for Parameter Selection [20.4.1 NMAC § 264.13(b)(1)]

Parameter selection for waste characterization is based on the physical form of the waste (e.g., debris) and on knowledge of the process generating the waste. To determine whether a solid waste is hazardous, LANL uses AK (which includes process knowledge), supplemented by sampling and analysis, if necessary, as described in Sections B.3.1.1 and B.3.1.2. The analytical parameters selected to confirm knowledge-based waste characterization for hazardous waste, MLLW, and MTRUW, and the rationale for the selected parameters are identified in Tables B-7, B-8, and B-9, respectively. MTRUW characterization incorporates characterization procedures from the WIPP permit (NMED, 2002) requirements, which are based on knowledge of raw materials and physical/chemical processes of waste-generating activities and by verification methods. Additional characterization procedures will be implemented as needed to meet the requirements of the WIPP permit or other LANL waste management conditions.

Appendix III of 20.4.1 NMAC, Subpart II, Part 261, provides references which list approved analytical methods used to determine the concentrations of hazardous constituents in the liquid and solid fractions and extracts of waste samples. All the methods are fully described in the most recent version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (*SW-846)*. These and other approved methods will be used, as necessary, to determine whether a waste stream is hazardous. Samples will not be analyzed for all listed hazardous constituents, only those that are most likely to be present based on the source of the waste stream.

Detailed instructions for conducting Toxicity Characteristic Leaching Procedure (TCLP) waste analysis are found in the most recent version of *SW-846* and are incorporated by reference into 20.4.1 NMAC, Subpart II, Part 261, Appendices II and III. Also listed in the most recent version of *SW-846* is the appropriate analytical method for each hazardous constituent required to determine if the waste contains a contaminant in excess of the maximum contaminant concentration regulated under 20.4.1 NMAC, Subpart II, Part 261. TCLP is a method for leaching hazardous constituents from the solid portion of the waste and is used only if the solids constitute more than 0.5% of the waste by weight. The laboratory can also forego extraction if: 1) total analysis of the waste shows the concentrations of the analytes are so low, an extract of the waste could not contain analytes at concentrations above the regulatory limits; or 2) analysis of any liquid portion of the waste contains such high concentrations of hazardous constituents that, even accounting for dilution, the entire sample would be hazardous.

Many RCRA hazardous wastes are restricted from land disposal under the Hazardous and Solid Waste Amendments unless they are treated first to substantially diminish their toxicity and reduce the likelihood that hazardous constituents will migrate from the disposal site. As required in 20.4.1 NMAC, Subpart VIII, Part 268, each waste shipment must be accompanied by a notification stating whether the restricted waste meets specific LDR treatment standards promulgated for hazardous constituents, or is otherwise exempt. In most cases, the notification can be completed after laboratory analysis of the waste. If an LDR notification is based solely on knowledge of the waste, the supporting documentation will be kept on record, in accordance with 20.4.1 NMAC § 268.7.

B.3 CHARACTERIZATION PROCEDURES [20.4.1 NMAC §§ 264.13(a)(1) AND 264.13(b)(2), AND 20.4.1 NMAC § 270.14(b)(2)]

Throughout LANL, it is required that characterization of wastes be considered before a waste-generating process will begin. The preliminary characterization of waste begins prior to actual generation (at the point of concept and design of a process or system), which in turn allows the generator to determine whether AK, sampling and analysis, or a combination of the two will be required prior to actual waste characterization for transport to one of the permitted storage facilities at LANL.

The approach to characterization of hazardous wastes, MLLW, and MTRUW is based on the chemical, physical, and radiological nature of the waste stream. Characterization procedures require that information for the waste stream be provided on waste characterization documentation, accompanied by sampling and analysis data or AK documentation. The waste characterization documentation will be submitted to LANL's waste management personnel for review, classification, and approval prior to acceptance at the TRUWF. This characterization is accomplished by using AK and/or sampling and analysis, which are described in the following sections.

Trained personnel review the waste characterization documentation for adequacy and waste acceptance criteria (WAC) acceptability. Training for use of waste characterization documentation is included in a facility waste documentation course. This training provides step-by-step instructions on how to complete forms for characterizing wastes. If the documentation is incomplete or does not contain sufficient information to adequately characterize or classify the waste, the documentation is returned to the generator for additional information. Examples of further documentation that may be requested include more detailed process knowledge and description or additional/new analytical data to meet WAC requirements for the off-site treatment, storage, or disposal facility (TSDF).

Waste characterization documentation allows waste classification and assignment of EPA Hazardous Waste Numbers, as needed; preparation of LDR documentation; and proper management of the waste. Once the waste characterization documentation is reviewed, classified, and approved, the generator is notified and paperwork is prepared for shipping. The shipping documentation is submitted to LANL's waste management personnel and reviewed against the waste characterization documentation and Department of Transportation regulations. If approved, the waste shipment is scheduled for transport to the appropriate TSDF. If the shipping documentation is inadequate or does not correspond with the characterization documentation, the shipping documentation is returned to the generator for corrections.

Upon receipt and prior to accepting the waste containers for storage at the container storage/treatment unit at the TRUWF, waste shipments will be inspected to ensure that the shipping documentation and the waste characterization documentation have the proper approvals in addition to ensuring that compliance with the WAC and all federal and state regulations are met. Both the waste characterization documentation and the shipping documentation will become part of the operating record upon receipt of the waste. These records will be made available within a reasonable timeframe to the NMED, upon request.

Reevaluation of initial characterization information is performed to verify the accuracy of the initial waste characterization, to ensure that applicable treatment standards have been met, when there is a change in a waste-generating process, when the generator requests a review, or when analytical results indicate a change in a waste stream. Waste streams are reevaluated annually to verify that they have not changed. This annual reevaluation will be accomplished through review and recertification of applicable waste characterization documentation, and the documented reevaluation will be maintained in the facility operating record. Any information that indicates a change in the process that generates the waste and/or affects the waste will require the waste to be recharacterized.

B.3.1 Hazardous and Mixed Low-Level Waste Characterization

Characterization procedures for hazardous waste and MLLW are selected based on the physical nature of the waste stream (e.g., homogeneous or heterogeneous waste). Homogeneous solid waste will be characterized for the presence of hazardous components of the waste (i.e., VOCs, SVOCs, and metals) on the basis of AK and, if necessary, sampling and analysis. Heterogeneous solid waste is typically characterized on the basis of AK for the following reasons: (1) the physical, chemical, and/or radiological nature of the waste makes it difficult to obtain representative samples; (2) the lack of appropriate sampling methodology; and (3) for MLLW, safety concerns associated with unnecessary exposure to the radioactive component of the waste (i.e., as low as reasonably achievable [ALARA] concerns). In the event AK is used to characterize the waste, characterization documents are reviewed with the help of subject matter experts, when necessary, to achieve the most comprehensive characterization available before waste is approved for transport to a permitted container storage unit.

Chemicals of an unknown nature are handled on a case-by-case basis. The individual waste is initially characterized by knowledge of the operations and activities that were performed in the specific area in which the waste was generated. This information is used to restrict the choices of initial waste analysis to a smaller population of chemicals and is not the sole basis of waste characterization. In the event that RCRA hazardous wastes are present in the initial waste analysis, more definitive AK is obtained, including, as appropriate, further analysis for sufficient and complete waste characterization prior to waste acceptance at a permitted storage unit.

For purposes of managing unknown wastes, a small volume is defined at LANL as one liquid gallon (approximately four liters) or less. The rationale for the small volume designation is that this is the minimum quantity of sample needed to test if the waste is hazardous. At and below this limit, the sample may be consumed in the analytical procedure. Small volumes of unknown wastes are typically analyzed for pH, flash point, and reactivity. This allows the material to be categorized for further management.

Volumes greater than one gallon (four liters) of a single unknown waste allow a more detailed analytical scheme. These wastes are tested for ignitability, corrosivity, reactivity, toxicity characteristics, and/or any other parameters indicated by the initial data gathered on the material.

Sufficient detail must be reported to allow the assignment of the proper EPA Hazardous Waste Number(s) to the waste. Characterization methods used are provided in Tables B-7 and B-8.

Information regarding the presence of free liquids in containers of hazardous waste and MLLW is obtained through generator waste-characterization knowledge, visual examinations, and/or the Paint Filter Liquids Test.

B.3.1.1 Acceptable Knowledge [20.4.1 NMAC §§ 264.13(a)(2) and 264.13(b)(5), and 20.4.1 NMAC § 270.14(b)(2)]

The physical, chemical, and radiological nature of some waste forms (e.g., heterogeneous) makes collection of representative samples for characterization difficult. This difficulty arises from several factors, some of which include: waste streams that contain disparate elements; disparate elements may need to be segregated into similar forms; large objects which cannot fit within standard size sample containers; and laboratories which do not have the capability to sample large objects (EPA, 1992). Other difficulties arise from health and safety risks to personnel due to potential exposure to radioactive material (i.e., ALARA concerns) or explosive material.

Acceptable knowledge is a method used to characterize the waste streams utilizing process knowledge and additional waste analysis data. According to EPA guidance, *acceptable knowledge* is broadly defined to include process knowledge, additional characterization data, and/or facility records of analysis (EPA, 1994A). Consistent with the 1994 guidance, EPA defined "acceptable knowledge" as it applies to TRU waste destined for WIPP as "any information about the process used to generate the waste, material inputs to the process, and the time period during which the waste was generated . . ." [Code of Federal Regulations, Title 40 (40 CFR), § 194.254(c)(3)]. EPA recognizes AK as an "integral part" of the system for controls for waste characterization of certain types of DOE waste (see *67 FR 51930, 51942* [August 9, 2002]).

Process knowledge is described in 20.4.1 NMAC § 264.13(a)(2) [10-1-03], as data developed under 20.4.1 NMAC, Subpart II, Part 261, and existing published or documented data on a specific hazardous waste or hazardous waste generated from similar processes. EPA described *process knowledge* as knowledge of waste characteristics derived from information generated contemporaneously with the waste on the materials or processes used to generate the waste. This information may include administrative, procurement, and quality control documentation associated with the generating process, or past sampling or analytical data. Usually, the major elements of process knowledge include information about the process used to generate the waste, material inputs to the process, and the time period during which the waste was generated (see *67 FR 51934*).

Additional characterization data includes data obtained from chemical or physical analysis or review that is not subject to RCRA protocols, such as the most recent version of *SW-846* and other approved methods, or through testing of similar or surrogate waste streams. These data can be used to determine if wastes are RCRA-regulated and to determine LDR status.

Facility records of analysis consist of waste analysis and/or physical characterization performed prior to the effective date of RCRA regulations. These analytical results must be accurate and applicable to the specified waste and should be supplemented with other existing information (e.g., published data).

For characterization, the following examples from EPA guidance (EPA, 1994A) are appropriate for the use of AK:

- Hazardous components in wastes from specific processes are well documented, such as with F-listed and K-listed wastes.
- Wastes are discarded unused commercial chemical products, reagents, or chemicals of known physical and chemical properties.
- Health and safety risks to personnel would not justify sampling and analysis (e.g., radioactive mixed waste).
- Physical nature of the waste does not lend itself to taking a laboratory sample.

Waste characterization documentation based solely on AK is reviewed by appropriate personnel, with the aid of subject matter experts if necessary, to determine if one or more of the above criteria have been met. The criteria must be provided or available for review to ensure that a valid and accurate RCRA hazardous waste characterization can be made before acceptance at a permitted container storage unit. While AK documentation will be maintained at the generator's location for at least three years as required by 20.4.1 NMAC § 262.40, it must be in a format so that waste management personnel and/or subject matter experts can obtain copies or review the documentation at the generator's site. The latter would be the case with classified or sensitive AK documentation that cannot be sent to the container storage unit due to security requirements. A traceable identifier (i.e., process or AK document number or alphanumeric designation) is assigned by the generator on the waste characterization documentation, and must be referenced in such a way that generators can access the information at their site for as long as required by RCRA regulation.

B.3.1.1.1 Process Knowledge

For characterization, process knowledge consists of one or more of the following:

- Detailed information on a waste stream obtained from existing published or documented waste analysis data;
- Studies conducted on hazardous wastes generated by processes similar to that which generated the waste; and
- Knowledge of the materials and operations that generated the waste and that demonstrates the potential for hazardous components in the waste. For example, metals present in debris waste are often associated with specific materials (e.g., lead in leaded rubber or lead shielding).

Waste generators obtain, assemble, and prepare the process knowledge documentation for each waste stream. There are many sources of applicable documentation at LANL that are acceptable to substantiate process knowledge for a specific waste stream. Examples of documentation that are acceptable include, but are not limited to, the following:

- Process design documents (e.g., Title II Design).
- Preliminary and final safety analysis reports, unreviewed safety question determinations, and technical safety requirements.
- Standard operating procedures and detailed operating procedures, which can include a list of the raw materials or reagents, a description of the process/experiment that uses the materials, and a description of the wastes generated and how the wastes are handled.
- Waste packaging logs.
- Test plans or research project reports that describe the reagents and other raw materials used in an experiment.
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).
- Information from site personnel (e.g., documented interviews).

- Standard industry practice documents (e.g., vendor information).
- Industry reports on a similar process when there is a clear connection between the LANL process/experiment and the industry's similar process/experiment.
- Previous analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, or routine waste verification sampling.
- Analytical data from studies of common industry processes that are similar to LANL processes. These data can be used to identify the chemical composition in a specific “similar” process waste stream and to determine the regulatory status of the waste.
- Material Safety Data Sheets, product labels, and other product package information.
- Sampling and analysis data from comparable waste streams.
- Documented visual inspections to confirm or identify the physical characteristics and packaging of a waste.
- Laboratory notebooks that detail the research processes and raw materials used in an experiment.
- Corrective action site characterization data, waste characterization data, waste characterization strategy documentation, and RCRA Facility Investigation documentation.

B.3.1.1.2 Additional Characterization Data

Additional characterization data used for AK include information for the waste stream provided by the generator. These data may be qualitative in nature, not subject to an approved quality control program, or performed on a similar waste stream. This information can be the result of a recent analysis of the waste, a well-documented historical analysis of the waste, and/or the analysis of a surrogate waste stream. For example, data from the analysis of nonradioactive leaded-rubber glove waste may be used to evaluate the characteristics of similar radioactive leaded-rubber glove waste. Sampling nonradioactive inputs or outputs from processes may also provide data that are useful for characterizing a similar mixed waste stream.

B.3.1.2 Sampling and Analysis [20.4.1 NMAC §§ 264.13(a)(3), 264.13(b)(2), (3), and (4), and 20.4.1 NMAC § 270.14(b)(2)]

This section discusses proposed sampling and analytical procedures and frequency of sampling applicable to hazardous waste and the hazardous component of MLLW. The approach described for characterizing these waste types is based on the radiological, physical, chemical, and hazardous properties of the waste. If necessary for waste characterization purposes, chemical data will be obtained, as needed, through solid and liquid waste sampling techniques.

For waste streams that can be representatively sampled (i.e., homogeneous), sampling and analysis is performed when a waste lacks sufficient process information to adequately characterize the waste based on AK. A representative sample of the waste is collected and handled by means that preserve its original physical form and composition and prevent contamination or changes in concentration of the constituents to be analyzed. Analytical methods for the determination of RCRA-regulated metals, VOCs, and SVOCs are conducted to meet certain technical performance criteria and to be consistent with regulatory guidelines. Personnel involved in sampling and analysis comply with LANL-specific protocol consistent with the most recent version of *SW-846* (EPA, 1986) and/or other approved methods.

Many analytical laboratories provide sample containers and specify required minimum volumes for individual waste types or physical states. The most important determinants of sampling method and volume are the physical state of the waste (liquid, solid, sludge), the waste container (drum, tank), accessibility, waste variability, and safety concerns. Detailed sampling recommendations and guidance are provided in the most recent version of *SW-846*, Chapter 9. For solids, 500 grams in a glass container is usually adequate. Liquid sample volumes vary from one liter to approximately eight liters, depending on the number of analysis parameters and solids content. Sample jars for samples to be analyzed for VOCs must be completely filled to minimize volatilization of contaminants from the liquid into the headspace.

Sampling is performed with a device appropriate for the waste being sampled. Sampling devices include, but are not limited to, weighted bottles, bailers, or composite liquid waste samplers for sampling liquids in drums, pits, or tanks. Augers, triers, scoops, shovels, and similar types of devices are useful for sampling solid wastes in containers or other locations.

The aim of the sampling method is to obtain a sample or samples representative of the waste stream. Sampling personnel must use an understanding of the waste-generating and -handling processes to ensure samples are representative. Some wastes separate into distinct layers with time, and representative samples must include aliquots from each layer. In some cases, it may be important to use a statistical or random sampling scheme that provides for the collection of representative samples.

A number of criteria must be considered in determining how many samples are required, how locations are selected, and how frequently sampling should be repeated. If a highly uniform waste stream is generated from a single process location, one sample collected annually is sufficient. However, if a single waste stream is a mixture of materials generated in several locations under varying conditions through time, more samples will be required, and composite sampling may be appropriate. At a minimum, the sampling must be repeated if the waste-generating process changes in a material way, or if inspection of the waste reveals it has changed.

Appendix I of 20.4.1 NMAC, Subpart II, Part 261, lists specific guidance documents that detail sampling protocols for different waste types. Waste samples collected in accordance with these protocols are considered representative by EPA. The protocols include standards developed by the American Society for Testing and Materials (ASTM) and portions of the most recent version of *SW-846*.

B.3.1.2.1 Solid Waste Analysis [20.4.1 NMAC § 264.13(b)(3)]

If necessary for waste characterization purposes, solid homogeneous waste streams are sampled and analyzed for total metal content, VOCs, and SVOCs. The sampling protocol for solid hazardous waste and MLLW is based on sampling methods approved by EPA for solid waste and soil sampling in the most recent version of *SW-846*, as well as other approved methods. These methods are designed to ensure that representative waste samples are collected consistently and transferred to the responsible laboratory in a manner that maintains sample integrity.

If necessary for waste characterization purposes, homogeneous waste streams will be sampled and analyzed for the toxicity characteristic (TC) contaminants listed in 20.4.1 NMAC § 261.24 [10-1-03]. Analysis for total concentration of TC contaminants may be performed on samples in a screening step, as described in Section 1.2 of Method 1311 (TCLP). If total concentrations are used in the waste characterization process, analytical data will be compared to the TC regulatory levels expressed as total values. These total values will be considered the regulatory threshold limit (RTL) values for the determination of whether a particular waste exhibits a TC. RTL values are obtained by calculating the weight/weight concentration (in the solid) of a TC contaminant that would give the regulatory weight/volume concentration in the TCLP extract. If the total concentrations are less than the RTL value, the waste does not exhibit the toxicity characteristic and the TCLP does not need to be completed for the screened TC contaminants.

B.3.1.2.2 Liquid Waste Analysis

Liquid wastes generated at LANL consist of aqueous solutions, slurries, and organic liquids. If necessary for waste characterization purposes, these wastes will be sampled and analyzed for total metal content, VOCs, and SVOCs. In accordance with Method 1311 (TCLP), liquid wastes (i.e., those wastes that contain less than 0.5 percent dry solids) do not require extraction. The liquid waste, after filtration, is defined as the TCLP extract. Liquid waste, therefore, is characterized by filtering the waste, measuring total contaminant concentrations in the resulting filtrate, and comparing these concentrations to the TC regulatory levels in 20.4.1 NMAC § 261.24 [10-01-03].

Wastes that contain both a liquid and a solid phase are characterized using total analytical data for the solid phase to determine toxicity characteristics. This is accomplished by comparison with the TC regulatory levels for each phase in a manner consistent with the discussion in Section B.3.1.2.1. The following formula (EPA, 1994b) will be used to calculate the maximum theoretical leachate concentrations for the combined phases:

$$\frac{[A \times B] + [C \times D]}{B + [20 \text{ liters/kilogram} \times D]} = M$$

Where,

A = concentration of the analyte in the liquid portion of the sample (milligrams/liter)
B = volume of the liquid portion of the sample (liter)
C = concentration of the analyte in the solid portion of the sample (milligrams/kilogram)
D = weight of the solid portion of the sample (kilogram)
M = maximum theoretical leachate concentration (milligrams/liter).

B.3.1.2.3 Sample Handling, Preservation, and Storage

Table B-10 presents requirements specified in the most recent version of *SW-846* regarding sample containers, preservation techniques, and holding times associated with sample collection. Adherence to these requirements will ensure that sampling and analysis meet quality objectives for data. In the event the specified criteria are not met, another sample will be collected and submitted for analysis.

B.3.1.2.4 Analytical Laboratory Selection and Analytical Methods [20.4.1 NMAC § 264.13(b)(2)]

Analytical laboratories at LANL and/or approved subcontractor laboratories will perform the detailed qualitative and quantitative chemical analyses specified in Tables B-11 and B-12 of this WAP. These laboratories must have:

- A documented comprehensive quality assurance (QA)/quality control (QC) program
- Technical analytical expertise
- A document control/records management plan
- The capability to perform data reduction, validation, and reporting.

The selection and development of analytical testing methods for LANL waste streams were based on the following considerations:

- The physical form of the waste
- Analytes of interest
- Required detection limits (e.g., regulatory thresholds)
- Information requirements (e.g., verify compliance with LDR treatment standards, waste classification).

Collectively, these factors contributed to the selection of the analytical methods specified in Tables B-11 and B-12. Qualified analytical laboratories at LANL and/or approved subcontractor laboratories that meet the above criteria will be used for the required analyses.

B.3.1.3 Verification Frequencies [20.4.1 NMAC §§ 264.13(a)(3) and 264.13(b)(4)]

In the event that the TA-52 TRUWF accepts hazardous waste or MLLW from other waste management units at LANL, a verification program will be implemented. The verification program will follow the program currently implemented at TA-54 as described below.

The waste verification process at TA-54 applies to waste received at the facility and designated for storage and/or off-site treatment and/or disposal. Personnel involved in verification activities are trained and qualified for the activities they perform.

Waste may be identified as part of the verification program at TA-54 through any of the following:

- Random selection, with a bias toward AK waste streams,
- Past performance of the waste generators, including previous non-conformances, and
- Incomplete or suspect documentation.

Once the waste stream has been designated for verification, waste verification personnel are notified of its pending arrival at the unit. Waste streams needing verification are sampled in accordance with approved EPA and ASTM protocols. Verification frequencies vary by the types of waste received at the facility. Some waste streams may only require a visual verification of the container's contents.

If the characterization for the waste stream is found to be inconsistent with the documentation, a non-conformance report (NCR) is issued. The NCR program is used both to trigger further verification of waste and as enforceable criteria for TA-54 waste verification program. Depending on the severity of the discrepancy, the waste generator or waste-generating facility may be subject to increased verification review under the program, and the waste may not be accepted for management at TA-54.

B.3.2 Mixed Transuranic Waste Characterization

MTRUW characterization and certification for disposal in WIPP is performed by the Centralized Characterization Project (CCP), which is under contract with the U.S. DOE Carlsbad Field Office (CBFO) to perform TRU waste characterization and certification services at many sites throughout the DOE complex. The interfaces between LANL and CCP are described in the most recent revision of the CCP/LANL Interface Document (CCP, 2006a). LANL is responsible for safely storing MTRUW, providing areas where CCP equipment can be set up and operated, providing waste that can be certified for disposal in WIPP, and repackaging any waste that cannot be certified for disposal in WIPP. CCP provides the equipment, personnel, procedures, and training to characterize MTRUW, certify that waste for disposal, and transport that waste to WIPP. The following summarizes the requirements for characterizing and certifying waste for disposal, as presented in the most recent revision of the “CCP Transuranic Waste Characterization Quality Assurance Project Plan” (CCP 2007a). MTRUW not destined for WIPP is characterized as described in Section B.3.2.2 of this WAP.

Initial characterization of both homogeneous and heterogeneous MTRUW is based primarily on AK. Additional characterization to meet WIPP certification procedures will be implemented at appropriate LANL or other facilities to meet requirements of the WIPP WAP permit conditions. Pursuant to WIPP certification and WIPP WAP requirements, further characterization of homogeneous waste will be accomplished through AK, statistically-based sampling and analysis, headspace gas sampling, RTR, and visual examination. Further characterization of heterogeneous waste will be implemented at appropriate LANL or other facilities using AK, headspace gas sampling, RTR, and visual examination. MTRUW not destined for WIPP but stored at LANL is characterized using the routine procedures used for hazardous waste and MLLW, as discussed in Section B.3.2.2.

The MTRUW streams described in Section B.1.2.3 are categorized by Summary Category Groups based on the physical and chemical form of the waste. Homogeneous waste streams in the solid process residue (Summary Category Group S3000), soil/gravel (Summary Category Group S4000), or aqueous liquids/slurries (Summary Category Group L1000) categories may contain RCRA-regulated VOCs, SVOCs, and metals and will be characterized using AK and/or sampling and analysis. Debris waste streams (Summary Category Group S5000) consist of heterogeneous materials and, as such, it is difficult to obtain representative samples of these wastes. Therefore, debris waste will be characterized for the presence of hazardous components using AK based on examination of the original materials and operations from which the waste was generated, followed by RTR, visual examination, and headspace gas sampling.

MTRUW destined for storage at the TRUWF container storage units must meet the following WAC for free liquids: 1) no more than two liters of liquid in a 55-gallon drum; 2) no more than eight liters of liquid in a standard waste box; 3) no more than one inch of liquid in the bottom of any container; and 4) internal containers must be well drained and only contain residual liquids. Compliance with this requirement is verified through RTR or visual examination.

The QAPjP referenced above addresses MTRUW characterization procedures to be utilized after the waste is stored at LANL. These procedures were developed primarily to meet the off-site WAC. CCP's use of these procedures is designed to allow appropriate waste characterization information obtained for storage to serve as a basis for or to supplement future characterization needs without a duplication of effort. Because the QAPjP and other WIPP permit-derived documents addressing MTRUW characterization are subject to change as new information is provided, developed, or approved, and because LANL is not subject to their requirements in LANL's operating permit for storage, but rather utilizes them as waste management guidelines, this WAP will not be modified as ongoing changes to the referenced documents occur.

CCP has prepared a records inventory and disposition schedule for all waste characterization data and related QA/QC records for MTRUW to be shipped to WIPP. These documents will be designated as Lifetime Records or Non-Permanent Records as defined by the schedule and Table B-6 of the WIPP permit. Lifetime Records will be maintained for the life of the LANL MTRUW characterization program plus six years and then offered to WIPP or the appropriate Federal Records Center for permanent archival. Non-Permanent Records will be maintained for 10 years after the date of record generation and then disposed of according to the schedule.

B.3.2.1 CCP TRU Waste Certification Plan

The most recent revision of the CCP TRU Waste Certification Plan (CCP, 2007b) incorporates the certification requirements of the "Waste Acceptance Criteria for the Waste Isolation Pilot Plant" (WIPP WAC) (DOE, 2002 or most recent version) for MTRUW that will be sent to that site. It establishes the programmatic framework and requirements within which waste generators operate to ensure that their wastes can be certified as meeting the sampling, characterization, and packaging requirements of the WIPP WAC. These include CCP documents and procedures by which the waste stream analytical data and other AK information are evaluated. Once this documentation has been prepared, it is subject to review and approval by CCP and CBFO personnel. Waste generators also participate in external audits, as required by the QAPjP and the CCP TRU Waste Certification Plan, to verify the characterization and certification process. If the requirements of the WIPP WAC and the "CCP Transuranic Authorized Methods for Payload Control" (CCP, 2006b) are met, the waste will be certified and transported to WIPP.

B.3.2.1.1 Acceptable Knowledge

AK characterization procedures for MTRUW stored at LANL prior to certification for WIPP acceptance are the same as those described in Section B.3.1.1. The CCP QAPjP (CCP, 2007a) describes how CCP ensures compliance with the WIPP requirements associated with the compilation, confirmation, and administrative controls of AK information. CCP procedures consistent with the WIPP WAP are used to implement AK as part of the waste certification program for WIPP to ensure the AK information is compiled in an auditable record, the facility and MTRUW management operations are described and correlated to specific waste stream information, prohibited wastes are identified and segregated, discrepancies in AK are resolved, and the appropriate EPA Hazardous Waste Numbers are assigned.

B.3.2.1.2 Real-Time Radiography [20.4.1 NMAC § 264.13(b)(2), and 20.4.1 NMAC § 270.14(b)(2)]

RTR is a nondestructive, qualitative, and semi quantitative assay technique that involves x-ray scanning of waste containers to identify and verify, using appropriate equipment and qualified operators, the physical form(s) of waste container contents. RTR will be used to verify the absence of free liquids and prohibited items and that the physical form requirements of the WIPP WAC are met. At the same time, RTR will verify the waste classification (i.e., Summary Category Group) and waste form determined using AK. All MTRUW containers will be analyzed by RTR or Visual Examination, and the results for each waste container will be documented. An RTR data form will be used to document the types and quantities of material types observed in each container.

A radiography system routinely consists of an x-ray producing device, an imaging system, an enclosure for radiation protection, a waste container-handling system, an audio/video recording system, and an operator control and data acquisition station. Operating parameters such as the intensity of the x-ray can be varied for optimum viewing of the interior of the waste container. The imaging system typically utilizes an image intensifier, television camera, and remotely-located television screen. Instrument configurations will vary depending on manufacturer and site usage.

During operation of the system, the waste container is scanned while the operator views and permanently records the image from the television screen on audio/videotape. The radiography data form is also used to document the materials present and other information about the containerized waste, as required by the WIPP permit.

The radiography image produced is examined for evidence of liquid materials by jogging the container or repetitively moving the container-handling system and searching for evidence of wave motion in addition to observing the container contents for suspect waste items. The container contents are also observed for items that confirm the waste classification of the container. Conditions that limit or interfere with this determination are noted.

Operator training and experience are important considerations for assuring the quality of the radiography data. Only properly trained personnel are allowed to operate radiography equipment. Standardized training requirements for radiography operators are based upon existing industry standard training requirements. Radiography operators receive formal and on-the-job training in project requirements, system operations and standards, safe operating practices, application techniques, specific waste-generating practices, packaging configurations, parameter estimation, and identification of prohibited items. Operators must be trained and tested before they are qualified for RTR operation, and must requalify at least every two years. CCP operating and training requirements for RTR analysis of MTRUW are based on Attachment B1, "Waste Characterization Sampling Methods," Section B1-3, "Radiography" (NMED, 2002 or most recent version).

B.3.2.1.3 Visual Examination [20.4.1 NMAC § 264.13(b)(2), and 20.4.1 NMAC §270.14(b)(2)]

The contents of select MTRUW containers may be visually examined in lieu of RTR. Visual examination will also verify aspects of AK amenable to visual confirmation. For example, the visual examination will verify the physical characteristics of a waste and the associated Summary Category Group (i.e., Summary Category Group S3000, S4000, or S5000). In addition, visual examination will verify the presence of certain hazardous constituents, such as lead in lead bricks or lead-lined gloves. These types of visual confirmations will either verify or refute the overall AK used to characterize the waste stream.

The contents of each container undergoing visual examination will be provided on a visual examination data form. Visual examination procedure operators receive formal and on-the-job training in project requirements, safe operating practices, specific waste-generating practices, packaging configurations, waste parameter estimation, and identification of prohibited items. Operators must be trained and qualify for visual examination procedures and must requalify at least every two years. CCP operating and training requirements for visual examination of MTRUW are based on Attachment B1, "Waste Characterization Sampling Methods," Section B1-3b(3), "Visual Examination" (NMED, 2002 or most recent version).

B.3.2.1.4 Headspace Gas Sampling [20.4.1 NMAC §§ 264.13(b)(2) and (3), and 20.4.1 NMAC § 270.14(b)(2)]

Headspace gas sampling and analysis is a qualitative screening technique used to confirm the presence of certain regulated hazardous constituents. This method of characterization includes representative sampling and analysis of headspace gas from the container headspace of randomly selected MTRUW containers. This data will be used to resolve the assignment of Hazardous Waste codes and to verify AK characterization data. Headspace gas sampling will not be relied upon to prove the absence of a hazardous constituent in a waste.

The precision, accuracy, and representativeness of headspace gas samples will be evaluated for adherence to the QAPjP QA objectives through analysis of field QC samples and adherence to QC practices. Sampling and analysis methods for the determination of VOCs in the headspace of MTRUW containers must meet the requirements in the WIPP WAP.

B.3.2.1.5 Solid Waste Sampling and Analysis

MTRUW homogenous solid wastes are not currently sampled or analyzed at LANL except for waste treated at the TA-55 cementation unit as described in the most recent version of the LANL General Part B (LANL, 2003). This characterization activity for other MTRUW is performed at an off-site facility under the CCP program. If at a future date sampling and/or analytical operations are to be implemented at LANL, these operations will be conducted under the CCP program with approved CCP procedures.

B.3.2.2 Non-WIPP Mixed TRU Waste Characterization

MTRUW may be generated, re-characterized, or accepted at LANL that is not currently destined for characterization and shipment to WIPP and subject to the WIPP certification requirements. Examples of this type of waste stream are MTRUW that is not generated by defense programs and items that are not compliant with the WIPP WAC.

Characterization procedures for these types of wastes will consist of the same procedures as those described for hazardous waste and MLLW in Section B.3.1 of this plan. These wastes will be characterized using AK and/or sampling and analysis on the same basis as discussed in Section B.3.1.1. AK for these wastes can also include additional AK verification procedures for MTRUW, as discussed in Section B.3.2.1, depending on the waste type.

Characteristic MTRUW that is not currently destined for disposition at WIPP will be required to complete characterization for underlying hazardous constituents (UHC) as discussed in Section B.5.3.

B.4 OFF-SITE WASTE ACCEPTANCE PROCEDURES [20.4.1 NMAC §§ 264.13(a)(3)(II) AND (a)(4); 264.13(b)(5); AND 264.13(c)]

This section discusses general waste acceptance procedures that will be used when hazardous or mixed waste is accepted from off-site waste-generating facilities. These procedures will be used to meet the requirements of 20.4.1 NMAC §§ 264.13(a)(3)(ii), 264.13(a)(4), 264.13(b)(5), and 264.13(c) [10-01-03]. Specific descriptions of the waste streams to be received by LANL from these facilities and the appropriate waste characterization documentation and acceptance procedures are included in LANL's permit renewal documentation. The basis for characterization of waste streams to be accepted by LANL is generator documentation of the waste. For off-site waste, all of LANL's routine waste characterization documentation will, at a minimum, be collected from the generator and reviewed for completeness and accuracy by LANL in accordance with standard procedures. Off-site preshipment inspection of the waste will be used to examine the waste and its documentation, if the information provided by the generator is insufficient to meet LANLWAC.

Uniform Hazardous Waste Manifests and LDR Notification Forms, as applicable, will be prepared for each shipment of off-site hazardous or mixed waste to LANL and verified by LANL waste management personnel. Upon receipt at LANL, waste shipments will be physically examined for correct documentation, presence and correctness/completeness of waste container identification and labeling, and conformance with LANL container types and waste compatibility for storage and segregation, as appropriate. If discrepancies are found, nonconformance procedures will be followed to resolve the discrepancy. Acceptable options for resolution will include shipment of the waste back to the off-site generation facility, or temporary storage pending further analysis or characterization.

If LANL accepts hazardous waste from an off-site facility, each shipment is inspected and analyzed as necessary to determine that it matches the waste identified on the waste manifest. These requirements are reiterated under LDR.

Additional waste characterization activities in support of WIPP certification will generally be the purpose of MTRUW shipments to LANL from off site, and discrepancies may become apparent as part of characterization, as described in Section B.3.2. Resolution of such discrepancies will be performed in accordance with the procedures contained in each analytical method in conformance with the WIPP permit.

B.5 SPECIAL PROCEDURAL REQUIREMENTS [20.4.1 NMAC § 264.13(b)(6)]

Waste management requirements specific to ignitable, reactive, and incompatible waste, as well as for compliance with LDR and Subpart CC regulations, are described below. Although not required for the MTRUW predominately to be managed at the TRUWF, these may apply for segregated waste items or waste streams managed in the future.

B.5.1 Procedures for Ignitable, Reactive, and Incompatible Wastes to be Stored

Pursuant to 20.4.1 NMAC § 264.17 [10-01-03], specific waste management procedures for ignitable, reactive, and incompatible wastes to be stored are described as follows. These waste management methods vary depending on the physical form and type of waste managed. To ensure that these wastes are managed safely and properly, their characteristics are identified and documented as described in Section B.3, they are labeled appropriately, and the waste types are physically segregated within each container storage unit. Wastes are segregated and stored, as appropriate, by their physical characteristics (i.e., liquids or solids) and according to the following compatibility groups: (1) flammables/ignitables; (2) oxidizers; (3) corrosive acids; (4) reactive with water; (5) corrosive bases; (6) other reactives; and (7) other wastes.

B.5.2 Procedures to Ensure Compliance with LDR Requirements [20.4.1 §§ 268.7(a) and 268.7(b)(3), (4), and (5)]

The LDR contained in 20.4.1 NMAC, Subpart VIII, Part 268, identify hazardous wastes restricted from land disposal; define those circumstances under which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage, or disposal unit; specify treatment standards; and describe testing, tracking, and recordkeeping requirements for generators and TSDFs. This section describes the approach used by LANL treatment and storage facilities to comply with LDR requirements.

The characterization documentation for all waste streams to be treated or stored on-site are reviewed as described in Section B.3. The documentation is evaluated:

- To ensure that appropriate EPA Hazardous Waste Numbers and UHCs exceeding treatment standards are identified and that the wastes are accompanied by generator notifications/certifications, if required by 20.4.1 NMAC § 268.7(a).
- To determine whether the waste is exempt or excluded, already meets the treatment standards, or must be treated on site, off site, or both to meet all treatment standards.
- To identify the appropriate TSDF to which the waste will next be sent.

LANL maintains the waste characterization data and other records, as specified in Section B.3.

If waste is to be treated on site to meet the LDR requirements, the treatment unit must comply with the testing and reporting requirements of 20.4.1 NMAC § 268.7(b). After treating the waste, the treated waste/residue is evaluated to determine whether all treatment standards have been met. The treatment standards are defined in 20.4.1 NMAC §§ 268.40, 268.45, 268.48, or 268.49, depending on the type of waste treated. Residues from wastes with concentration-based treatment standards are analyzed by the appropriate methods described in Section B.3.1.2 to assure that the waste meets applicable treatment standards. For wastes or contaminated soil with treatment standards expressed by the waste extract, the TCLP procedures described in Sections B.3.1.2.1 or B.3.1.2.2 will be used.

The treatment facility prepares the certifications appropriate to excluded debris treated to 20.4.1 NMAC § 268.45 alternative standards, soil treated to 20.4.1 NMAC § 268.49 standards, characteristic wastes for which all characteristics have been treated and all Universal Treatment Standards have been met, characteristic wastes for which all characteristics have been treated but not all treatment standards are achieved, and/or other special certifications required for materials such as soil. New waste characterization documentation, incorporating the treatment facility paperwork requirements of 20.4.1 NMAC § 268.7(b) or the generator paperwork requirements of 20.4.1 NMAC § 268.7(a) if the residue is considered a newly-generated waste or is being shipped to another TSDF, is prepared for the treated waste/residue, as appropriate. The certifications/notifications and waste characterization documentation are used to determine where the waste will be sent for further treatment, storage, or disposal. The appropriate 20.4.1 NMAC § 268.7(a) notifications are prepared before sending any waste subject to LDR to an off-site TSDF. Most receiving facilities have their own WAC requirements, specifying how the LDR information will be submitted. The receiving facilities usually require that analytical data be provided before the waste is shipped to ensure the waste meets their WAC. Waste may be sent to TA-54 or other LANL storage units after treatment or directly off-site from the treatment facility.

For wastes received from off-site, LANL will require an LDR notification that addresses all LDR requirements applicable to the specific waste type. If off-site wastes are treated at LANL, LANL will comply with the requirements of 20.4.1 NMAC §268.7(b), as discussed above.

As a permitted storage facility, LANL must comply with the 20.4.1 NMAC, Subpart VIII, Part 268, Subpart E, prohibitions on storage. Generally, wastes subject to LDR can be stored no longer than one year. However, the LDR provide relief from the storage prohibition for wastes that have received a variance or waiver from treatment or have no practical disposal alternative. Other rulemaking may also exempt waste from LDR. For example, MTRUW destined for WIPP is not be subject to LDR under the Federal Facilities Compliance Order (FFCO) and the WIPP Land Withdrawal Act. The 1992 Federal Facility Compliance Act (Pub.L. 102-386, 106 Stat. 1505) exempts LANL's mixed waste from the storage prohibitions under 20.4.1 NMAC, Subpart VIII, Part 268, so long as LANL is in compliance with a state-issued order and Site Treatment Plan (STP). NMED issued LANL an FFCO and approved an STP setting forth schedules for LDR compliance. LANL is in compliance with its FFCO and STP and, therefore, the storage prohibition under 20.4.1 NMAC, Subpart VIII, Part 268, does not apply to mixed waste covered by the FFCO.

B.5.3 Procedures to Ensure Compliance with Subpart CC Requirements [40 CFR § 264.1082]

LANL waste streams described in this document may be subject to 40 CFR, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers," based on applicability criteria specified in 20.4.1 NMAC § 264.1080. For waste units that are not exempt from this Subpart under 20.4.1 NMAC §264.1080(b), LANL will address the applicable Subpart CC requirements. In addition, the exemption from standards specified in 20.4.1 NMAC §§264.1084 through 264.1087 can be demonstrated is the average VOC concentration is less than 500 parts per million by weight (ppmw) at the point of waste origination as described in 20.4.1 NMAC § 264.1083 (a) and 264.1082(c)(1). This determination shall be reviewed and updated as necessary at least every twelve months.

The characterization documentation will be reviewed prior to acceptance of the waste at a permitted container storage unit, as discussed in Section B.3.Characterization requirements for waste that has been treated to meet the exemptions allowed at 20.4.1 NMAC §§264.1082(c)(2) and (4) are summarized below. Details for specific treatment criteria and analytical requirements associated with each exemption can be found at the regulations cited.

- In accordance with 20.4.1 NMAC § 264.1082(c)(2)(i), waste is treated to reduce the volatile organic (VO) concentration to less than 500 ppmw that is measured in either a waste from a single point of origination or individual wastes from multiple points of origination commingled before treatment. The waste shall be analyzed prior to and after treatment pursuant to provisions at 20.4.1 NMAC 264.1083(b).

- In accordance with 20.4.1 NMAC § 264.1082(c)(2)(ii), waste is treated to reduce the VO concentrations by at least 95% and the treated waste VO concentration is ensured to be less than 100 ppmw. The waste shall be analyzed prior to and after treatment pursuant to provisions at 20.4.1 NMAC § 264.1083(b).

- In accordance with 20.4.1 NMAC § 264.1082(c)(2)(iii), waste is treated to remove VO mass greater than or equal to the VO mass that exceeded the 500 ppmw. The waste shall be analyzed prior to and after treatment pursuant to provisions at 20.4.1 NMAC § 264.1083(b).

- In accordance with 20.4.1 NMAC § 264.1082(c)(2)(v), waste is treated to reduce the VO concentration to less than the lowest VO concentration for all individual waste streams mixed together at the point of origin and less than 500 ppmw. The waste must be analyzed prior to and after treatment pursuant to provisions at 20.4.1 NMAC § 264.1083(a) and (b).

- In accordance with 20.4.1 NMAC § 264.1082(c)(2)(vi), waste is treated to reduce the VO concentration by 95% and each individual waste stream entering the treatment process is certified to be less than 10,000 ppmw. The waste shall be analyzed prior to and after treatment pursuant to provisions at 20.4.1 NMAC 264.1083(a) and (b).

- In accordance with 20.4.1 NMAC § 264.1082(c)(4), waste is treated to meet LDR standards, either concentration-based or technology-based. LDR compliance is determined for concentration-based using either analysis or AK.

B.6 REFERENCES

ASTM, 1991, “Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds,” ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

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Table B-1

Regulatory References and Corresponding Waste Analysis Plan Location

Regulatory Citation(s)	Description of Requirement	Location in the Waste Analysis Plan
§264.13	General waste analysis	Throughout document
§264.13(a)(1)	A detailed chemical and physical analysis of a representative sample of the waste prior to treatment, storage, or disposal of the waste	B.2, B.3
§264.13(a)(2)	Analysis may include data developed under Part 261 and existing published or documented data on the hazardous waste or on hazardous waste generated from similar processes	B.3.1, B.3.2, B.3.3
§264.13(a)(3)	Analysis must be repeated as necessary to ensure that it is accurate and up to date	B.3.1, B.3.2, B.3.3
§264.13(a)(3)(i)	Analysis repeated when owner/operator has reason to believe that the process or operation generating the hazardous wastes, or nonhazardous wastes if applicable under § 264.113(d), has changed	B.3.1, B.3.2, B.3.3
§264.13(a)(3)(ii)	For off-site facilities, analysis repeated when the results of the inspection required in § 264.13(a)(4) indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper	B.4
§264.13(a)(4)	Owner/operator of an off-site facility must inspect and, if necessary, analyze each hazardous waste received to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper	B.4
§264.13(b)	Development and implementation of waste analysis plan	Entire document
§264.13(b)(1)	Parameters for which each hazardous waste, or non-hazardous waste if applicable under § 264.113(d), will be analyzed and the rationale for selection of the parameters	B.2, Tables B-7, B-8, and B-9
§264.13(b)(2)	Test methods which will be used for the proposed parameters	B.3, Tables B-11, and B-12
§264.13(b)(3)	Sampling method which will be used to obtain a representative sample of the waste to be analyzed	B.3
§264.13(b)(3)(i)	Sampling methods described in Appendix I of Part 261	B.3.1, B.3.2, B.3.3
§264.13(b)(3)(ii)	An equivalent sampling method	B.3.1, B.3.2, B.3.3
§264.13(b)(4)	Frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date	B.3.1, B.3.2, B.3.3

Table B-1 (Continued)

Regulatory References and Corresponding Waste Analysis Plan Location

Regulatory Citation(s)	Description of Requirement	Location in the Waste Analysis Plan
§264.13(b)(5)	For off-site facilities, the waste analyses that hazardous waste generators have agreed to supply	B.4
§264.13(b)(6)	Where applicable, the methods to meet additional waste analysis requirements for specific waste management methods as specified in § 264.17 (ignitable, reactive, or incompatible), § 264.314 (bulk and containerized liquids), § 264.341 (waste analysis for incinerators), § 264.1034(d) (Subpart AA), § 264.1063(d) (Subpart BB), § 264.1083 (Subpart CC), and § 268.7 (Land Disposal Restrictions)	B.5
§264.13(b)(7)	The procedures and schedules for surface impoundments exempted from land disposal restrictions under § 268.4(a)	NA
§264.13(b)(7)(i)	Sampling of impoundment contents	NA
§264.13(b)(7)(ii)	Analysis of test data	NA
§264.13(b)(7)(iii)	Annual removal of residues which are not delisted under § 260.22 or which exhibit a characteristic of hazardous waste and either:	NA
§264.13(b)(7)(iii)(A)	Do not meet applicable treatment standards of Part 268, Subpart D; or	NA
§264.13(b)(7)(iii)(B)	Where no treatment standards have been established;	NA
§264.13(b)(7)(iii)(B)(1)	Such residues are prohibited from land disposal under § 268.32 or the Resource Conservation and Recovery Act § 3004(d); or	NA
§264.13(b)(7)(iii)(B)(2)	Such residues are prohibited from land disposal under § 268.33(f)	NA
§264.13(b)(8)	For owner/operator seeking an exemption to the air emission standards of Subpart CC in accordance with § 264.1082	B.5.4
§264.13(b)(8)(i)	If direct measurement is used for the waste determination, the procedures and schedules for waste sampling and analysis and the results of the analysis of test data to verify the exemption	B.5.4
§264.13(b)(8)(ii)	If knowledge of the waste is used for the waste determination, any information prepared by the facility owner/operator or by the generator of the hazardous waste if the waste is received from off-site, that is used as the basis for knowledge of the waste	B.5.4
§264.13(c)	For off-site facilities, the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper	B.4

Table B-1 (Continued)

Regulatory References and Corresponding Waste Analysis Plan Location

Regulatory Citation(s)	Description of Requirement	Location in the Waste Analysis Plan
§264.13(c)(1)	The procedures to determine the identity of each movement of waste managed at the facility	B.4
§264.13(c)(2)	The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling	B.4
§264.13(c)(3)	The procedures for an off-site landfill receiving containerized hazardous wastes to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container	NA

[a] NA = not applicable

Table B-2
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Spent Solvents	Research and development (R&D) activities; laser research; organic and inorganic chemistry research (e.g., solvent extractions, liquid chromatography solvents, polymer synthesis, and distillations); cleaning; and degreasing operations	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]	Acetone, Acetonitrile, Antimony, Benzene, Cadmium, Cyanides (Total), 1,2-Dichloroethane, 1,4-Dioxane, Ethyl ether, Methanol, Methylene chloride, Toluene, Trichloroethylene, Triethylamine
			D002	Corrosivity	NA[e]	
			D003	Reactivity	NA[e]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D026	Cresol	200.0[h]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D032	Hexachlorobenzene	0.13	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
			U213	Tetrahydrofuran	NA[e]	

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Contaminated Solid Wastes	Machining operations, chemistry research, decontamination and decommissioning projects, metal finishing operations, HE wastewater filtration, and general maintenance operations	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]	Barium, Beryllium, Cadmium, Carbon disulfide, Chloroform, Chromium (Total), Ethel ether, Lead, Mercury-all others, Methanol, Methyl ethyl ketone, Methylene chloride, Nickel, Phenol, p,p'-DDT, Selenium, Silver, Thallium, Trichloroethylene
			D003	Reactivity	NA[e]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D023	o-Cresol	200.0[h]	
			D024	m-Cresol	200.0[h]	
			D025	p-Cresol	200.0[h]	
			D026	Cresol	200.0[h]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D031	Heptachlor (and its epoxide)	0.008	
			D032	Hexachlorobenzene	0.13	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0[f]	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogented solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
			K045	Spent carbon	NA[e]	

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Paint and Related Wastes	Painting and finishing operations, and general facility maintenance	Acceptable Knowledge[d] Sampling and Analysis	D001 D005 D006 D007 D008 D009 D011 D036 F003 F005	Ignitability Barium Cadmium Chromium Lead Mercury Silver Nitrobenzene Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] 100.0 1.0 5.0 5.0 0.2 5.0 2.0 NA[e] NA[e]	Lead, Methyl ethyl ketone
Photographic and Photocopier Wastes	Photographic film processing and photocopier operations	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D006 D007 D008 D011	Ignitability Corrosivity Cadmium Chromium Lead Silver	NA[e] NA[e] 1.0 5.0 5.0 5.0	Silver

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Corrosive Liquid Wastes	Analytical chemistry research, electro-etching, and electro-polishing	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D038 F002 F003 F005 P023	Ignitability Corrosivity Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform Pyridine Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Chloroacetaldehyde	NA[e] NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 5.0 NA[e] NA[e] NA[e] NA[e]	Acetone, Arsenic, Barium, Cadmium, Chromium (Total), Cyanides (Total), 2,4-Dinitrophenol, Fluoride, Isobutyl alcohol, Lead, Mercury-all others, Methanol, Nickel, o-Nitrophenol, Selenium, Silver, Sulfide, Thallium, Triethylamine, Zinc
Solid Metals and Metallic Compounds	Machining and cutting operations; synthesis reactions; solder from electronic manufacturing, repair, and brazing operations; and grinding operations	Acceptable Knowledge[d] Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0	Arsenic, Lead, Nickel, Silver

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges	Vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D023 D024 D025 D026 D027 D028 D029 D030 D032 D033 D034 D035 D036 D037 D038 D039 D040 D041 D042 D043 F001 F002 F003 F004 F005	Ignitability Corrosivity Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform o-Cresol m-Cresol p-Cresol Cresol 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethylene 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Methyl ethyl ketone Nitrobenzene Pentrachlorophenol Pyridine Tetrachloroethylene Trichloroethylene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0[h] 200.0[h] 200.0[h] 200.0[h] 7.5 0.5 0.7 0.13[f] 0.13[f] 0.5 3.0 200.0 2.0 100.0 5.0 0.7 0.5 400.0 2.0 0.2 NA[e] NA[e] NA[e] NA[e] NA[e]	Acetone, Acetonitrile, Antimony, Arsenic, Barium, Benzene, Cadmium, Carbon tetrachloride, Chromium (Total), Chrysene, p-Cresol, m-Dichlorobenzene, 1,2-Dichloroethane, 4,6-Dinitro-o-cresol, 1,4-Dioxane, Fluorene, Indeno(1,2,3-c,d) pyrene, Lead, Mercury-all others, Methanol, Methyl ethyl ketone, Methylene chloride, Naphthalene, p-Nitrophenol, Pyridine, Selenium, Silver, Tetrachloroethylene, Toluene, Trichloroethylene, 2,4,6-Trichlorophenol, Zinc

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Mercury Wastes	Lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance	Acceptable Knowledge[d] Sampling and Analysis	D003 D008 D009 D011 U151	Reactivity Lead Mercury Silver Mercury	NA[e] 5.0 0.2 5.0 NA[e]	Barium, Chromium (Total), Mercury-all others, Thallium, Zinc
Used Batteries and Battery Fluids	Equipment maintenance	Acceptable Knowledge[d]	D002 D003 D006 D007 D008 D009 D011 D038	Corrosivity Reactivity Cadmium Chromium Lead Mercury Silver Pyridine	NA[e] NA[e] 1.0 5.0 5.0 0.2 5.0 5.0[f]	Cadmium, Lead, Pyridine, Silver
Unused/Off-specification Commercial Chemical Products	R&D, spill residues, and general facility operations	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D003 D004 through D043 All P- and U-listed EPA Hazardous Waste Numbers[g]	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] -[c] NA[e]	Acetonitrile, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Nickel, Selenium, Silver, Toluene

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	
			D002	Corrosivity	NA[e]	
			D003	Reactivity	NA[e]	
			Potential D-coded EPA Hazardous Waste Numbers	Toxicity characteristic wastes	-[c]	
			Potential P-and U-listed EPA Hazardous Waste Numbers[g]	Discarded commercial chemical products and off-specification species	NA[e]	
Corrective Action Soils and Sludges	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closures	Acceptable Knowledge[d] Sampling and Analysis	D001	Ignitability	NA[e]	Barium, Cadmium, Lead
			D003	Reactivity	NA[e]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D022	Chloroform	6.0	
			D030	2,4-Dinitrotoluene	0.13[f]	
			D032	Hexachlorobenzene	0.13[f]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D036	Nitrobenzene	2.0	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D042	2,4,6-Trichlorophenol	2.0	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Corrective Action Aqueous Liquids	Decontamination of remedial equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated storm water runoff	Acceptable Knowledge[d] Sampling and Analysis	D001 D002 D004 D005 D006 D007 D008 D009 D010 D011 D038 F002 F003 F005	Ignitability Corrosivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Pyridine Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 5.0 NA[e] NA[e] NA[e]	
Corrective Action Debris	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closures	Acceptable Knowledge[d]	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D030 D032 D033 D034 D036 D039 D040 D042	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Tetrachloroethylene Trichloroethylene 2,4,6-Trichlorophenol	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 0.13[f] 0.13[f] 0.5 3.0 2.0 0.7 0.5 2.0	Barium, Lead

Refer to footnotes at end of table.

Table B-2 (Continued)
Descriptions of Hazardous Waste Stored at LANL

Waste Description[a]	Waste-Generating Process[a]	Basis for Characterization[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Corrective Action Debris (continued)			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

a Denotes information from the Los Alamos National Laboratory waste characterization documentation database.
b U.S. Environmental Protection Agency.
c A solid waste exhibits the characteristics of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart II, Part 261, Subpart C [6-14-00].
d Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994. "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
e Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.
f The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level (20.4.1 NMAC, Subpart II, 261.24, Table 1) [6-14-00].
g Refers to the P- and U-listed wastes found in the "Los Alamos National Laboratory General Part A Permit Application," Revision 3.0, 2002, Los Alamos National Laboratory, Los Alamos, New Mexico.
h If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table B-3

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes						
Soils with Heavy Metals	Decontamination and decommissioning (D&D) and Corrective Action activities	Acceptable Knowledge[d] and Preliminary Analysis[e]	D004 D005 D006 D007 D008 D009 D010 D011	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0	Arsenic, Barium, Chromium (Total), Mercury-all others, Selenium, Vanadium, Zinc
Environmental Restoration Soils	Remediation of release sites and D&D activities	Acceptable Knowledge[d] Sampling and Analysis	D005 D006 D007 D008 D009 D028 D029 F001 F002 F004 F005	Barium Cadmium Chromium Lead Mercury 1,2-Dichloroethane 1,1-Dichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	100.0 1.0 5.0 5.0 0.2 0.5 0.7 NA[e] NA[e] NA[e] NA[e]	Chromium (Total), Lead
Inorganic Solid Oxidizers	D&D of research laboratories and research and development (R&D)	Acceptable Knowledge[d]	D001 D003 D005	Ignitability Reactivity Barium	NA[e] NA[e] 100.0	
Lead Waste	Radioisotope experiments and other reactor, accelerator, laser, and x-ray activities	Acceptable Knowledge[d]	D002 D003 D007 D008 D009	Corrosivity Reactivity Chromium Lead Mercury	NA[e] NA[e] 5.0 5.0 0.2	Lead
Noncombustible Debris	Maintenance, D&D, R&D, and corrective action activities	Acceptable Knowledge[d]	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Spent halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 NA[e] NA[e]	Arsenic, Cadmium, Chromium (Total), Lead, Mercury-all others

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes (Continued)						
Combustible Debris	Maintenance, R&D, D&D, and corrective action activities	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Lead, Mercury-all others, Nickel, Zinc
			D003	Reactivity	NA[e]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	
Organic-Contaminated Noncombustible Solids	Vacuum pump maintenance, R&D, D&D, and corrective action activities	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Methoxychlor, Methyl ethyl ketone
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D027	1,4-Dichlorobenzene	7.5	
			D030	2,4-Dinitrotoluene	0.13[f]	
			D032	Hexachlorobenzene	0.13[f]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D037	Pentrachlorophenol	100.0	
			D038	Pyridine	5.0[f]	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F004	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes (Continued)						
Organic-Contaminated Combustible Solids	Maintenance, D&D, and corrective action activities	Acceptable Knowledge[d]	D001 D003 D007 D008 D009 D030 D035 F001 F002 F003 F005	Ignitability Reactivity Chromium Lead Mercury 2,4-Dinitrotoluene Methyl ethyl ketone Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 5.0 0.2 0.13[f] 200.0 NA[e] NA[e] NA[e] NA[e]	
Water-Reactive Wastes	Cleanup of HE firing-site debris, machining and disassembly of test components	Acceptable Knowledge[d]	D001 D003 D005 F002	Ignitability Reactivity Barium Spent halogenated solvents	NA[e] NA[e] 100.0 NA[e]	
Mercury Wastes	Cleanup operations	Acceptable Knowledge[d]	D005 D007 D008 D009 F001	Barium Chromium Lead Mercury Spent halogenated solvents	100.0 5.0 5.0 0.2 NA[e]	Mercury-all others
Unused Solid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge[d]	D001 D002 D003 All P- and U-listed EPA Hazardous Waste Numbers[h]	Ignitability Corrosivity Reactivity Discarded commercial chemical products and off-specification species	NA[e] NA[e] NA[e] NA[e]	

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes						
Spent Solvents and Contaminated Solvent Mixtures	Maintenance, cleaning, and degreasing activities: R&D; processing operations, such as extraction, bench-scale experimental inorganic chemistry, environmental analysis, radiochemistry	Acceptable Knowledge[d]	D001	Ignitability	NA[e]	Tribromomethane (Bromoform)
			D002	Corrosivity	NA[e]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D030	2,4-Dinitrotoluene	0.13[f]	
			D032	Hexachlorobenzene	0.13[f]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D036	Nitrobenzene	2.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[e]	
			F002	Spent halogenated solvents	NA[e]	
			F003	Spent non-halogenated solvents	NA[e]	
			F005	Spent non-halogenated solvents	NA[e]	

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes (Continued)						
Corrosive Liquid Wastes	Radiochemistry research, plutonium-processing operations, and analytical chemistry	Acceptable Knowledge[d]	D001 D002 D004 D006 D007 D008 D009 D010 D011 D036 D043 F001 F002 F005	Ignitability Corrosivity Arsenic Cadmium Chromium Lead Mercury Selenium Silver Nitrobenzene Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 1.0 5.0 5.0 0.2 1.0 5.0 2.0 0.2 NA[e] NA[e] NA[e]	Arsenic, Barium, Bromodichloromethane, Chromium (Total), Lead, Nickel, Silver
Aqueous and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	corrective action activities, metal-polishing operations, and radiochemistry research	Acceptable Knowledge[d] Sampling and Analysis[i]	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D023 D024 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform o-Cresol m-Cresol Spent halogenated solvents Spent non-halogenated solvents	NA[e] NA[e] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0[g] 200.0[g] NA[e] NA[e]	Chromium (Total), 1,2-Dichloroethane, Selenium

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes (Continued)						
Oil Wastes	Equipment maintenance operations	Acceptable Knowledge[d]	D004 D005 D006 D007 D008 D009 D010 D018 D019 D027 D028 D030 D032 D033 D034 D036 D037 D038 D041 D042 D043 F001 F002 F003 F005	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Benzene Carbon tetrachloride 1,4-Dichlorobenzene 1,2-Dichloroethane 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Pentrachlorophenol Pyridine 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	5.0 100.0 1.0 5.0 5.0 0.2 1.0 0.5 0.5 7.5 0.5 0.13[f] 0.13[f] 0.5 3.0 2.0 100.0 5.0[f] 400.0 2.0 0.2 NA[e] NA[e] NA[e] NA[e]	Diethylphthalate, Di-n-butyl phthalate, Hexachlorobenzene, Hexachlorocyclopentadiene, Nitrobenzene, Thallium, 2,4,5-Trichlorophenol, Silver
Unused Liquid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge[d]	D001 D002 D035 All P- and U-listed EPA Hazardous Waste Numbers[h]	Ignitability Corrosivity Methyl ethyl ketone Discarded commercial chemical products and off-specification species	NA[e] NA[e] 200.0 NA[e]	

See footnotes at end of table.

Table B-3 (Continued)

Descriptions of Mixed Low-Level Waste Stored at LANL

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents
Gas Cylinder Waste						
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge[d]	D001 D002 D003 Potential D-coded EPA Hazardous Waste Numbers	Ignitability Corrosivity Reactivity Toxicity characteristic wastes	NA[e] NA[e] NA[e] -[c]	
			Potential P- and U-listed EPA Hazardous Waste Numbers[i]	Discarded commercial chemical products and off-specification species	NA[e]	

[a] Denotes information from the Los Alamos National Laboratory waste characterization documentation database.
[b] U.S. Environmental Protection Agency.
[c] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart II, Part 261, Subpart C [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
[e] Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.
[f] The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level (20.4.1 NMAC, Subpart II, 261.24, Table 1 [6-14-00]).
[g] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter.
[h] Refers to the P- and U-listed wastes found in the "Los Alamos National Laboratory General Part A Permit Application," Revision 3.0, 2002, Los Alamos National Laboratory, Los Alamos, New Mexico.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table B-4

LANL MTRUW Stream Waste Matrix Codes Correlated with LANL Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	A-25	Leached Process Residues	002	Cemented Aqueous Waste	LA111	Solidified Aqueous or Homogeneous Inorganic Solids
			A-26	Evaporator Bottoms/Salts	006	Solidified Inorganic and Organic Process Solids	LA114	Solidified Inorganic Process Solids
			A-76	Cement Paste				
	S3100	Homogeneous Inorganic, Cemented Organics					LA126	Solidified Organic Process Solids
	S3100	Homogeneous Inorganic, Non-cemented	A-75	Chemical Treatment Sludge	003	Stabilized Aqueous Waste (dewatered sludge)	LA122	Solid Inorganic Waste
							LA130	Ash
	S3100	Homogeneous Inorganic, Salts	A-27	Nitrate Salts		Salt Waste	LA124	Pyrochemical Salt Waste
			A-28	Chloride Salts				
			A-29	Hydroxide Cake				
	S3100	Homogeneous Inorganic, Vermiculite	A-20	Hydrocarbon Oil – Liquid (Absorbed)			LA112	Solidified Organic Waste
			A-21	Silicon-Based - Liquid (Absorbed)				
S4000 – Soil/Gravel	S4100	Soil	A-90	Radioactively-Contaminated Soil				

See footnotes at end of table.

Table B-4 (Continued)

LANL MTRUW Stream Waste Matrix Codes Correlated with LANL Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S5000 - Debris	S5300	Combustible Debris	A-14	Combustible Decon Waste	004	Combustible Waste	LA116	Combustible Debris
			A-15	Cellulosics				
			A-16	Plastics				
			A-17	Rubber Materials				
			A-18	Combustible Lab Trash				
			A-35	Combustible Building Debris				
			A-40	Combustible Hot-Cell Waste				
			A-60	Other Combustibles				
	S5400	Heterogeneous Debris	A-10	Graphite Solids	001	Metal Scrap and Incidental Combustibles	LA115	Graphite Waste
			A-19	Combined Combustible/Non-Combustible Lab Trash	005	Combined Noncombustible / Combustible Waste	LA117	Metal Waste
			A-30	PN Equipment	005LG	Glass Waste	LA118	Glass Waste
			A-31	Non-PN Equipment	005LM	Metal Waste	LA119	HEPA Filter Waste
			A-36	Noncombustible Building Debris	005P1	Leaded Rubber and Metal Waste	LA123	Leaded Rubber and Metal Waste

See footnotes at end of table.

Table B-4 (Continued)

LANL MTRUW Stream Waste Matrix Codes Correlated with LANL Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
			A-41	Noncombustible Hot-Cell Waste	005P2G	Graphite Waste	LA125	Mixed Combustible / Noncombustible Waste
			A-46	Skull and Oxide				
			A-47	Slag and Porcelain				
			A-50	Metal Crucibles, Scrap, Dies				
			A-51	Precious Metals				
			A-52	Scrap Metal				
			A-55	Filter Media				
			A-56	Filter Media Residue				
			A-61	Other Noncombustibles				
			A-72	Beryllium Contaminated Debris				
			A-74	Ion Exchange Resin				
			A-80	Irradiation Sources				
			A-85	Firing Point Residues				
			A-95	Glass				

[a] RSWD = Radioactive Solid Waste Disposal [codes]
[b] IDC = Item Description Code
[c] TRUCON = TRUPACT-II Content [codes]

Table B-5

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	Plutonium processing operations	Acceptable Knowledge[d]	D002	Corrosive	NA[e]	
		Homogeneous Inorganic, Cemented Organics	Plutonium processing operations	Acceptable Knowledge[d]	D003	Reactive	NA[e]	
		Homogeneous Inorganic, Non-cemented	Plutonium processing operations	Acceptable Knowledge[d]	D004	Arsenic	5.0	
		Homogeneous Inorganic, Salts	Plutonium processing operations	Acceptable Knowledge[d]	D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	

See footnotes at end of table.

Table B-5 (Continued)

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Vermiculite	Plutonium processing operations	Acceptable Knowledge[d]	D002	Corrosive	NA[e]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D027	1,4-Dichlorobenzene	7.5	
					D028	1,2-Dichloroethane	0.5	
					D030	2,4-Dinitrotoluene	0.13[g]	
					D032	Hexachlorobenzene	0.13[g]	
					D033	Hexachlorobutadiene	0.5	
					D034	Hexachloroethane	3.0	
					D035	Methyl ethyl ketone	200.0	
					D036	Nitrobenzene	2.0	
					D037	Pentachlorophenol	100.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D042	2,4,6-Trichlorophenol	2.0	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	

See footnotes at end of table.

Table B-5 (Continued)

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S4000 – Soil/ Gravel	S4100	Soil	D&D	Acceptable Knowledge[d]	D004	Arsenic	5.0	D004
					D005	Barium hydroxide	100.0	D005
					D006	Cadmium	1.0	D006
					D007	Chromium	5.0	D007
					D008	Lead	5.0	D008
					D009	Mercury	0.2	D009
					D010	Selenium	1.0	D010
					D011	Silver	5.0	D011
					D018	Benzene	0.5	D018
					D019	Carbon tetrachloride	0.5	D019
					D021	Chlorobenzene	100.0	D021
					D022	Chloroform	6.0	D022
					D035	Methyl ethyl ketone	200.0	D035
					D038	Pyridine	5.0[g]	D038
					D039	Tetrachloroethylene	0.7	D039
					D040	Trichloroethylene	0.5	D040
					F001	Spent halogenated solvents	NA[e]	F001
					F002	Spent halogenated solvents	NA[e]	F002
					F003	Spent non-halogenated solvents	NA[e]	F003
					F005	Spent non-halogenated solvents	NA[e]	F005

See footnotes at end of table.

Table B-5 (Continued)

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

Summary Category Group	Waste Matrix Code	Waste Stream Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA[b] Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[c] (milligrams per liter)	Potential Underlying Hazardous Constituents[f]
S5000 - Debris	S5300	Combustible Debris	Plutonium processing operations	Acceptable Knowledge[d]	D003	Reactive	NA[e]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
	S5400	Heterogeneous Debris	Plutonium processing operations; D&D	Acceptable Knowledge[d]	D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[g]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[e]	
					F002	Spent halogenated solvents	NA[e]	
					F003	Spent non-halogenated solvents	NA[e]	
					F004	Spent non-halogenated solvents	NA[e]	
					F005	Spent non-halogenated solvents	NA[e]	
					U080	Methylene Chloride	NA[e]	

See footnotes at end of table.

Table B-5 (Continued)

Descriptions of Mixed Transuranic Waste Stored at LANL[a]

[a] This table is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), (TWCP-AK-2.1-019, R.0) (LA-UR-03-4870); and from waste characterization documentation information maintained by the Facility and Waste Operations Division. Waste with EPA Hazardous Waste Numbers that are not included in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit will not be transported to WIPP.
[b] U.S. Environmental Protection Agency.
[c] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed at a concentration equal to or greater than the respective value given in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II, Part 261, Subpart C [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
[e] Not Applicable.
[f] Potential underlying hazardous constituents (UHC) have been included, where the information is available. UHC characterization for the purpose of Land Disposal Restrictions will not apply for mixed transuranic waste to be disposed of at WIPP.
[g] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in § 268.2(i). Selenium is not an underlying hazardous constituent as defined at § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table B-6

Descriptions of Waste Generated at Off-Site Facilities That May Be Received at LANL

Off-Site Waste Generating Facility	Waste Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Constituents and/or Characteristics in the Waste
Sandia National Laboratories/New Mexico, Albuquerque, NM	Potential mixed transuranic waste: Combustible and noncombustible debris including metals, cellulosics, rubber, plastics, organic matrices, and inorganic materials.	To be determined	To be determined	To be determined	To be determined

Table B-7

Parameters, Characterization Methods, and Rationale for Parameter Selection for Hazardous Waste

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Spent Solvents	– Flash point (for liquid waste) – pH (for liquid waste) – RCRA[c]-regulated metals – Volatile organic compounds (VOC) – Semivolatile organic compounds (SVOC)	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, reactivity, and toxicity – Determine concentration of F-listed solvents
Contaminated Solid Wastes	– RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents
Paint and Related Wastes	– Flash point (for liquid waste) – RCRA[c]-regulated metals – VOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability and toxicity – Determine concentration of F-listed solvents
Photographic and Photocopier Wastes	– Flash point (for liquid waste) – pH (for liquid waste) – RCRA[c]-regulated metals	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, and toxicity
Corrosive Liquid Wastes	– Flash point (for liquid waste) – pH (for liquid waste) – RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, and toxicity – Determine concentration of F-listed solvents
Solid Metals and Metallic Compounds	– RCRA[c]-regulated metals	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, reactivity, and toxicity
Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges	– Flash point – RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents
Mercury Wastes	– RCRA[c]-regulated metal	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characterisitc for toxicity – Determine the presence of a U-listed unused commercial chemical product
Used Batteries and Battery Fluids	– pH (for liquid waste) – RCRA[c]-regulated metals	– Acceptable Knowledge[d]	– Determine characteristic for corrosivity and toxicity
Unused/Off-specification Commercial Chemical Products	– Flash point (for liquid waste) – pH (for liquid waste) – RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, reactivity, and toxicity – Determine presence of P-listed or U-listed unused commercial chemical products
Gas Cylinder Waste	– RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d]	– Determine characterisitic for ignitability, corrosivity, and reactivity – Determine presence of D-coded and U- and P-listed wastes
Corrective Action Soils and Sludges	– RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents

Refer to footnotes at end of table.

Table B-7 (Continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Hazardous Waste

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Corrective Action Aqueous Liquids	– pH – RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability, corrosivity, reactivity, and toxicity – Determine concentration of F-listed solvents
Corrective Action Debris	– RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability, reactivity, and toxicity – Determine concentration of F-listed solvents

[a] Information contained in this column is from the Los Alamos National Laboratory waste characterization documentation database.
[b] Parameter selection is based on acceptable knowledge for each waste stream. Additional parameters may be selected for each waste stream as necessary.
[c] Resource Conservation and Recovery Act. Use of the term "RCRA-regulated metals" refers to hazardous waste as defined in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II, 261.24 [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table B-8

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Low-Level Waste

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Wastes			
Soils with Heavy Metals	– RCRA-regulated metals[c]	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic
Environmental Restoration Soils	– RCRA-regulated metals[c] – Volatile organic compounds (VOC)	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine presence of F-listed solvents – Determine toxicity characteristic
Inorganic Solid Oxidizers	– RCRA-regulated metals[c]	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity
Lead Waste	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine characteristic for reactivity – Determine toxicity characteristic
Noncombustible Debris	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity
Combustible Debris	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– Determine toxicity characteristic – Determine presence of F-listed solvents – Determine characteristic for ignitability and reactivity
Organic-Contaminated Noncombustible Solids	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– Determine toxicity characteristic – Determine presence of F-listed solvents
Organic-Contaminated Combustible Solids	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability and reactivity – Determine toxicity characteristic – Determine presence of F-listed solvents
Water-Reactive Wastes	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic – Determine characteristic for ignitability and reactivity – Determine presence of F-listed solvents

Refer to footnotes at end of table.

Table B-8 (Continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Low-Level Waste

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Wastes (Continued)			
Mercury Wastes	– RCRA-regulated metals[c] – VOCs	– Acceptable Knowledge[d] – Sample and analyze randomly selected drums in waste stream	– Determine toxicity characteristic – Determine presence of F-listed solvents
Unused Solid Reagent Chemical Wastes	– RCRA-regulated metals[c]	– Acceptable Knowledge[d]	– Determine characteristic for ignitability and corrosivity – Determine the presence of P- and U-listed unused commercial chemical product
Liquid Wastes			
Spent Solvents and Contaminated Solvent Mixtures	– Flash point – pH – RCRA-regulated metals[c] – VOCs – Semivolatile organic compounds (SVOC)	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, and toxicity – Determine concentration of F-listed solvents
Corrosive Liquid Wastes	– Flash point – pH – RCRA-regulated metals[c] – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability, corrosivity, and toxicity – Determine concentration of F-listed solvents
Aqueous and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	– Flash point – RCRA-regulated metals[c] – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and Analysis	– Determine characteristic for ignitability and toxicity – Determine concentration of F-listed solvents
Oil Wastes	– RCRA-regulated metals[c] – VOCs – SVOCs	– Acceptable Knowledge[d] – Sampling and analysis	– Determine characteristic for toxicity – Determine concentration of F-listed solvents
Unused Liquid Reagent Chemical Wastes	– Flash point – pH	– Acceptable Knowledge[d]	– Determine characteristic for ignitability and corrosivity – Determine the presence of P- and U-listed unused commercial chemical product
Gas Wastes			
Gas Cylinder Waste	– RCRA[c]-regulated metals – VOCs – SVOCs	– Acceptable Knowledge[d]	– Determine characteristic for ignitability, corrosivity, and reactivity – Determine presence of D-coded and P- and U-listed waste

[a] Information contained in this column is extracted primarily from Los Alamos National Laboratory, 1995, "LANL's Federal Facility Compliance Order Site Treatment Plan Background Volume," Los Alamos National Laboratory, Los Alamos, New Mexico.
[b] Parameter selection is based on acceptable knowledge for each waste stream. Additional parameters may be selected for each waste stream as necessary.
[c] Resource Conservation and Recovery Act. Use of the term "RCRA-regulated metals" refers to hazardous waste as defined in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II, 261.24 [6-14-00].
[d] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table B-9

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Transuranic Waste

Summary Category Group/Description[a]	Waste Description	Parameters	Characterization Methods	Rationale
Storage				
S3000-Homogeneous Solids	– Solidified aqueous waste (e.g., concreted/cemented aqueous waste)	– Free liquids in waste matrix – Physical form of the waste	– Visual examination – Real-time radiography (RTR) – Acceptable Knowledge[b]	– Verify physical waste form – No free liquids allowed
	– Solidified aqueous waste (e.g., dewatered sludge and chemical treatment sludge) – Solidified inorganic/organic process solids and liquids	– Resource Conservation and Recovery Act (RCRA)-regulated metals	– Sample and analyze statistically selected number of drums in waste stream – Acceptable Knowledge[b]	– Determine toxicity characteristic – Determine concentration of metals
	– Homogeneous inorganic solids – Glass/noncombustible waste – Uncemented inorganics – Absorbed organics on vermiculite	– Volatile organic compounds (VOC) in container headspace gas	– Gas chromatography / mass spectrometry (GC/MS) – Fourier transform infrared spectrometry – Gas chromatography / Flame ionization detector – Acceptable Knowledge[b]	Qualitative screening to confirm the presence of VOCs
S4000-Soils/Gravels	– Contaminated soil	– Free liquids in waste matrix – Physical form of the waste	– Visual examination – RTR – Acceptable Knowledge[b]	– Verify physical waste form – No free liquids allowed
		– RCRA-regulated metals	– Sample and analyze statistically selected number of drums in waste stream – Acceptable Knowledge[b]	– Determine toxicity characteristic – Determine concentration of metals
		– VOCs in container headspace gas	– GC/MS – Fourier transform infrared spectrometry – Gas chromatography / Flame ionization detector	Qualitative screening to confirm the presence of VOCs

Refer to footnotes at end of table.

Table B-9 (Continued)

Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Transuranic Waste

Summary Category Group/Description [a]	Waste Description	Parameters	Characterization Methods	Rationale
Storage (continued)				
S5000-Debris Waste	– Mixed metal scrap and incidental combustibles – Combustible waste – Graphite waste – Metal waste – Glass waste	– Free liquids – Physical form of the waste – VOCs in container headspace gas – VOCs and semivolatile organic compounds	– Visual examination – RTR – Acceptable Knowledge[b]	– Verify physical waste form – No free liquids allowed – Determine compliance with land disposal restrictions (LDR) treatment standards, if applicable
	– Leaded-rubber and metal waste – High-efficiency particulate air filters – Noncombustible waste – Mixed combustible / noncombustible waste	– RCRA-regulated metals	– Gas chromatography / mass spectrometry – Fourier transform infrared spectrometry – Gas chromatography / Flame ionization detector – Acceptable Knowledge[b]	– Qualitative screening to confirm the presence of VOC – Determine compliance with LDR treatment standards, if applicable
Treatment				
L1000–Aqueous Liquids/Slurries	Evaporator bottoms solutions, aqueous waste, and laboratory solutions	– RCRA-regulated metals and corrosivity	– Acceptable Knowledge[b] – Sampling and Analysis	– Determine toxicity characteristics – Determine concentration of metals
S3000-Homogeneous Solids	Inorganic process solids and cemented inorganic process solids	– RCRA-regulated metals	– Acceptable Knowledge[b] – Sampling and Analysis	– Determine concentration of metals

[a] Information in this column is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), TWCP-AK-2.1-019, R.0, LA-UR-03-4870, Los Alamos National Laboratory, Los Alamos, New Mexico.

[b] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table B-10

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Volatile Organics			
Concentrated Waste Samples:	Method 5035: 40-milliliter (mL) vials with stirring bar. Method 5021: See method. Methods 5031 & 5032: 125-mL WM[c]-G[d]. Use Teflon-lined lids for all procedures.	Cool to 4º degrees Celsius (ºC)[e]	14 days
Aqueous Samples:			
No Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-mL vials with Teflon-lined septum caps.	Cool to 4ºC and adjust pH[f] to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-mL vials with Teflon-lined septum caps.	Collect sample in a 125-mL container which has been pre-preserved with 4 drops of 10% sodium thiosulfate solution. Gently swirl to mix sample and transfer to a 40-mL volatile organic analysis (VOA) vial. Cool to 4ºC and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Acrolein and Acrylonitrile	Methods 5030, 5031, & 5032: 2 x 40-mL vials with Teflon-lined septum caps.	Adjust to pH of 4-5. Cool to 4ºC	14 days
Soil/Sediments and Sludges:	Method 5035: 40-mL vials with stirring bar. Method 5021: See method. Methods 5031 & 5032: 125-mL WM[c]-G[d]. Use Teflon-lined lids for all procedures.	See the individual method	14 days

Refer to footnotes at end of table.

Table B-10 (Continued)

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Semivolatile Organics/Organochlorine Pesticides and Herbicides			
Concentrated Waste Samples:	125 mL WM[c]-G[d] with Teflon-lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days following extraction.
Soil/Sediments and Sludges:	250 mL WM[c]-G[d] with Teflon-lined lid	Cool to 4ºC	Samples must be extracted within 14 days and analyzed within 40 days following extraction.
Liquid Samples:			
No Residual Chlorine Present	1-gallon (gal.), 2 x 0.5 gal., or 4 x 1 liter (L) AG[g] container with Teflon[9]-lined lid	Cool to 4ºC	Samples must be extracted within 7 days and extracts analyzed within 40 days following extraction
Residual Chlorine Present	1-gal., 2 x 0.5 gal., or 4 x 1-L AG[g] with Teflon[9]-lined lid	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Addition of sodium thiosulfate solution to sample container may be performed in the laboratory prior to field use. Cool to 4ºC.	Samples must be extracted within 7 days and extracts analyzed within 40 days following extraction
Metals			
Aqueous Samples:			
Metals (except hexavalent chromium and mercury)	1-L P[h] or G[d]	Add nitric acid to adjust pH to less than 2.	180 days
Hexavalent chromium	500-mL P[h] or G[d]	Cool to 4ºC	24 hours
Mercury	500-mL P[h] or G[d]	Add nitric acid to adjust pH to less than 2.	28 days
Soil/Sediments and Sludges:			
Metals (except hexavalent chromium and mercury)	500-mL WM[c]-P[h] or G[d]	Cool to 4ºC	180 days
Hexavalent chromium	500-mL WM[c]-P[h] or G[d]	Cool to 4ºC	Not established - analyze as soon as possible.
Mercury	500-mL WM[c]-P[h] or G[d]	Cool to 4ºC	28 days

Refer to footnotes at end of table.

Table B-10 (Continued)

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations.
[b] Information primarily from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846,* U.S. Environmental Protection Agency, 1986 and all approved updates.
[c] WM = Wide-mouth
[d] G - Glass
[e] Adjust to pH of less than 2 with sulfuric acid, hydrochloric acid, or solid sodium bisulfate.
[f] A term used to describe the hydrogen-ion activity of a system.
[g] AG = Amber glass
[h] P = Polyethylene

Table B-11

Summary of Characterization Methods for Hazardous Waste

Parameter	Method Numbers	Test Methods	Rationale
Volatile organic compounds (VOC) in waste matrix: Spent halogenated solvents Spent nonhalogenated Solvents	ASTM Method D4547-91[a] U.S. EPA/540/4-91/001[b] SW-846 (1311, 8260B, 8275A)[c] or equivalent methods[d] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) Semivolatile organic compound (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[f]	Determine total and/or TCLP and SVOC/VOC concentration in samples of solids or liquids
SVOCs in waste:	SW-846 (1311 and 8270C)[c] or equivalent methods[d]	Total or TCLP SVOC analysis by GC/MS Acceptable Knowledge[f]	Determine total and/or TCLP and SVOC concentration in samples of solids or liquids
Resource Conservation and Recovery Act-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge[f]	Determine total and/or TCLP concentration in samples of solids or liquids
Reactive Sulfide	SW-846, Test Method to Determine Hydrogen Sulfide Released from Wastes[e] SW-846 (9030B, 9031, 9034)[c] or equivalent methods[d]	Colorimetric, titrametric, or spectrophotometric measurement of hydrogen sulfide released from waste following reflux distillation under acidic conditions	Determine concentration of reactive sulfides

Refer to footnotes at end of table.

Table B-11 (Continued)

Summary of Characterization Methods for Hazardous Waste

Parameter	Method Numbers	Test Methods	Rationale
Ignitability (Flash Point)	SW-846 (1010, 1020A, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitability of solids	Determine ignitablity
pH (Corrosivity)	SW-846 (9040B, 9041A, 9045C)[c] or equivalent methods[d]	pH electrometric measurement pH paper Soil and waste pH	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91001, Office of Research and Development.

[c] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

[d] Equivalent methods subject to EPA approval may be substituted.

[e] *SW-846*, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic.

[f] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

Table B-12

Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Method	Rationale
Solid Wastes			
Volatile organic compounds (VOC) in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] U.S. EPA/540/4-91/001[b] SW-846 (1311, 8260B, 8275A)[c] or equivalent methods[d] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromotography/mass spectrometry (GC/MS) Semivolatile organic compounds (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge[e]	Determine total and/or TCLP and VOC concentration in samples of solid process residues and soils
SVOCs in waste:	SW-846 (1311 and 8270C)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[e]	Determine total and/or TCLP and SVOC concentration in samples of solid process residues and soils
Resource Conservation and Recovery Act (RCRA)-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge[e]	Determine total and/or TCLP concentration in samples of solid process residues and soils
Liquid Wastes			
VOCs in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] EPA/540/4-91/001[b] SW-846 (1311 and 8260B)[c] or equivalent methods[d]	Total and/or TCLP VOC analysis by GC/MS Acceptable Knowledge[e]	Determine total and/or TCLP and VOC concentration in samples of liquid
SVOCs in waste:	SW-846 (1311 and 8270B)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge[e]	Determine total and/or TCLP and SVOC concentration in samples of liquid

Refer to footnotes at end of table.

Table B-12 (Continued)

Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Method	Rationale
Liquid Wastes (Continued)			
RCRA-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	SW-846 (1311, 6010B, 7060A, 7061A)[c] (1311, 6010B, 7080A, 7081)[c] (1311, 6010B, 7130, 7131A)[c] (1311, 6010B, 7190, 7191)[c] (1311, 6010B, 7420, 7421)[c] (1311, 6010B, 7470A, 7471A, 7472)[c] (1311, 6010B, 7740, 7741A, 7742)[c] (1311, 6010B, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge[e]	Determine total and/or TCLP concentration in samples of liquid
Ignitability (Flash Point)	SW-846 (1010, 1020A, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Acceptable Knowledge[e]	Determine ignitability
pH (Corrosivity)	SW-846 (9040B, 9041A, 9045C)[c] or equivalent methods[d]	pH electrometric Measurement pH paper Soil and waste pH Acceptable Knowledge[e]	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.
[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91991, Office of Research and Development.
[c] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
[d] Equivalent methods, subject to EPA approval, may be substituted.
[e] Acceptable knowledge is broadly defined as process knowledge, additional characterization data, and/or facility records of analysis, U.S. Environmental Protection Agency, 1994, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

APPENDIX C

INSPECTION PLAN

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

%	percent
20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
AR	Action Required
CFR	Code of Federal Regulation
CSU	container storage unit
DOT	U.S. Department of Transportation
IRF	Inspection Record Form
LANL	Los Alamos National Laboratory
m^3	cubic meters
NA	Not Applicable
ppm	parts per million
TA	technical area
TRUWF	Transuranic Waste Facility

APPENDIX C
INSPECTION PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 264.15, revised October 1, 2003 [10-01-03], this appendix presents inspection requirements that are applicable to the hazardous waste storage units at Los Alamos National Laboratory (LANL) and the inspection requirements that will be applicable to the storage/treatment unit at the Transuranic Waste Facility (TRUWF) at Technical Area 52. Pursuant to 20.4.1 NMAC § 264.15(a) [10-01-03], the inspection schedule for the unit has been developed to identify equipment malfunctions and deterioration, operator errors, and discharges that might cause or lead to a release of hazardous waste and pose a threat to human health and the environment. As specified in 20.4.1 NMAC § 270.14(b)(5) [10-01-03], this inspection plan, presents general inspection schedules, is being submitted with this permit modification package. Inspections will be conducted often enough to identify problems in time to correct them before they harm human health or the environment. Inspection schedules or methods may differ at certain waste management units based upon worker safety issues or the nature of the safety and emergency equipment. The inspection requirements and schedule for the hazardous waste management unit to be located at the TRUWF are consistent with and have been presented in this plan as the requirements and schedule for container storage units (CSUs) across LANL. Inspection requirements and schedules for the treatment units not covered within this application are presented in the most recent version of the LANL General Part B Permit Application (LANL, 2003) hereinafter referred to as the LANL General Part B.

C.1 GENERAL INSPECTION SCHEDULES AND REQUIREMENTS [20.4.1 NMAC § 270.14(b)(5) AND 20.4.1 NMAC § 264.15(b) AND (c)]

In accordance with the requirements of 20.4.1 NMAC § 270.14(b)(5), and 20.4.1 NMAC § 264.15(b)(1) [10-01-03], a written inspection schedule has been developed at LANL. This schedule will be followed for the inspection of monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are important to preventing, detecting, and responding to environmental or human health hazards. Inspections may be conducted at any time during the applicable day or week, as specified in the inspection schedule. A copy of this inspection plan, which includes inspection schedules, will be maintained by LANL's hazardous waste compliance personnel and by the site operator (i.e., the division or operating group that is responsible for or manages the unit at the TRUWF), as required in 20.4.1 NMAC § 264.15(b)(2) [10-01-03].

Inspection schedules outlining the items to be addressed on LANL's Hazardous Waste Facility Inspection Record Form (IRF) (Figure C-1) and inspection frequencies for the CSU to be permitted are provided in Section C.2. The IRF and instructions for its completion are provided for informational purposes only as Figure C-1 of this appendix; the form may be supplemented, changed, or otherwise replaced with an equivalent form. Pursuant to 20.4.1 NMAC § 264.15(b)(3) [10-01-03], the IRF lists the types of problems to be looked for during an inspection. The activities discussed below are addressed according to the specified regulatory requirements as well as to existing LANL inspection requirements for hazardous waste management units.

C.1.1 Inspection Records [20.4.1 NMAC § 264.15(d)]

Inspection training is provided through LANL's central training personnel. The division or operating group is responsible for ensuring that training is repeated, as necessary. After training, personnel assigned from the division or operating group that is responsible for or manages the unit will conduct inspections and record the information on IRFs or equivalent forms. The division or operating group responsible for or managing the unit will retain the inspection records for a minimum of three years from the date of inspection. During that timeframe, the inspection records will be available for review in the event that the New Mexico Environment Department or the U.S. Environmental Protection Agency inspects the facility for compliance with inspection requirements.

If necessary, LANL may modify the IRF or develop an equivalent form. Because the IRF is a comprehensive form, not all sections of the form apply to all units. The IRF encompasses 20.4.1 NMAC, Subpart V, Part 264 [10-01-03], requirements for permitted hazardous and mixed waste management units, and additional requirements directed by LANL policy. Instructions included with the IRF provide specific guidance for each inspection item listed.

The IRF or equivalent form will be completed according to the daily and/or weekly schedules provided in Section C.2. Inspections will be conducted and recorded in Parts I and II of the IRF for each working day or week that waste is opened, moved, received, stored, treated, or removed, as appropriate. Other records, such as a memo to file, may be used to document a condition of “No Use” at a unit.

For every item requiring inspection, a response indicating the condition of each item must be entered in the column under the appropriate day of the week. Responses may include "OK," "NA"

(Not Applicable), or "AR" (Action Required). If the response is AR, the action required must be noted in Part II of the IRF. If more than one AR is listed, ARs should be numbered. All ARs must be identified and noted, even if corrected immediately by the inspector. If inspection results indicate that corrective measures are warranted, any and all actions taken (along with time, date, and other pertinent information) will be recorded in Part II of the IRF and the AR noted on all subsequent IRFs until corrective measures are completed. Only after corrective measures have been completed and recorded on an IRF can an OK be entered in the "Condition" column on the IRF.

C.1.2 Inspection Frequency [20.4.1 NMAC § 264.15(b)(4)]

Inspection frequencies relevant to the unit types at the TRUWF is presented in Section C.2 of this appendix. Inspection frequencies may be increased at LANL's discretion when it determines that increased frequency may further assist in the detection or prevention of environmental hazards.

C.1.3 Actions Resulting From Inspections [20.4.1 NMAC § 264.15(c)]

If any defects, deterioration, operator errors, discharges, or potential hazards are discovered during an inspection, appropriate corrective measures (e.g., transfer of waste from a defective container to an appropriate container in good condition, repair or replacement of nonfunctioning equipment and/or systems, or removal of any accumulated liquids) will be completed on a schedule which ensures that the problem does not lead to an environmental or human health hazard. Any action taken in response to an inspection will be noted on the IRF or IRF documentation.

If a hazardous condition is imminent or has already occurred, an assessment of the condition will be made immediately, followed by appropriate remedial action. The condition will be assessed by the division or operating group that is responsible for or manages the unit. If this assessment indicates that human health or the environment may be adversely affected, the contingency plan (Appendix E of this document) may be implemented. The contingency plan discusses the appropriate responses to emergency situations. Evacuation determinations will be made as outlined in Table E-4 of the contingency plan. In the event the contingency plan is implemented, any sampling, decontamination, and verification will be conducted as specified in that plan. If the condition is such that the contingency plan is not implemented, remedial action will be defined and documented by the division or operating group that is responsible for or manages the unit.

C.2 INSPECTION SCHEDULE AND REQUIREMENTS FOR CONTAINER STORAGE UNITS [20.4.1 NMAC §§ 264.15(B) AND 264.174]

The TRUWF will be inspected according to the schedule provided below. Inspection frequencies are adequate based on the deterioration rates of equipment/systems and the probability of harm to human health or the environment if failure of the equipment/systems occurs, or any operator error goes undetected between inspections.

C.2.1 On Day(s) of Waste Handling

Inspections will be conducted every day of or the day after waste handling, with special attention placed on areas subject to spills, such as loading and unloading areas. Waste handling includes when waste is received at, moved or opened within, treated at, or removed from a CSU. For inspections of CSUs, the following items will be addressed, as appropriate:

- General information (Items 1-5)
- Secondary containment structures
- Run on/off control
- Covers/lids of containers
- Labels
- Accumulation start date
- Compatibility
- Structural integrity of containers
- (Un)loading area

C.2.2 Weekly

Weekly inspections of CSUs will be conducted every week that waste remains in storage. These weekly inspections will address the following items, as appropriate:

- General information (Items 1-5)
- Communications equipment
- Warning signs
- Security
- Work surfaces/floors
- Spill/fire equipment
- Eyewashes/safety showers
- Wind sock (if present)
- Secondary containment structures
- Run on/off control
- Covers/lids of containers
- Labels

- Accumulation start date
- Compatibility
- Structural integrity of containers
- (Un)loading area
- Aisle space/stacking
- Pallets/raised containers

C.3 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART AA REQUIREMENTS [20.4.1 NMAC, SUBPART V, PART 264, SUBPART AA]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart AA [10-01-03], are not applicable to any of the units at LANL.

C.4 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART BB REQUIREMENTS [20.4.1 NMAC, SUBPART V, PART 264, SUBPART BB]

Equipment at the facility that is subject to specific requirements for inspection, monitoring, and repair at 20.4.1 NMAC, Subpart V, Part 264, Subpart BB will comply as described below:

C.4.1 Requirements for Pumps In Light Liquid Service [defined by 20.4.1 NMAC § 264.1031 and outlined in 20.4.1 NMAC §§ 264.1052 and 264.1059]

- Leak detection monitoring must be performed monthly pursuant to 20.4.1 NMAC § 264.1063(b) requirements using Reference Method 21 in 40 CFR Part 60.
- Visual inspection for liquids dripping from the pump seal must be performed each calendar week.
- If a leak is detected, repair(s) shall be initiated no later than within 5 calendar days and completed as soon as possible, but no later than 15 calendar days.
  - A delay of repair is allowed if the repair is technically infeasible without shutting down the unit, and/or if the leaking equipment is isolated from the unit and does not contain or contact hazardous waste with greater than or equal to 10% by weight organics.

C.4.2 Requirements for Pressure Relief Devices In Gas/Vapor Service [20.4.1 NMAC §§ 264.1054 and 264.1059]

- Devices must be measured and monitored to ensure that they are operated with no detectable emissions (less than 500 parts per million (ppm) above background) pursuant to 20.4.1 NMAC § 264.1063(c) requirements using Reference Method 21 in 40 CFR Part 60.

- Measurement and monitoring will be performed as soon as practicable, but no later than 5 calendar days after a pressure release.
- A delay of repair is allowed if the repair is technically infeasible without shutting down the unit, and/or if the leaking equipment is isolated from the unit and does not contain or contact hazardous waste with greater than or equal to 10% by weight organics.

C.4.3 Requirements for Open-ended Valves or Lines [20.4.1 NMAC § 264.1056]

- Ensure that open-ended valves or lines are equipped with a cap, blind flange, or plug.
- Ensure that all caps, blind flanges, or plugs are sealed except during operations requiring movement of hazardous waste through the open-ended valve or line.

C.4.4 Requirements for Valves In Gas/Vapor or Light Liquid Service [defined by 20.4.1 NMAC § 264.1031 and outlined in 20.4.1 NMAC §§ 264.1057 and 264.1059]

- Leak detection monitoring must be performed monthly pursuant to 20.4.1 NMAC 264.1063(b) requirements using Reference Method 21 in 40 CFR Part 60.
  - If no leaks are detected for two successive months, monitoring frequency may be changed to the first month of every succeeding quarter unless a leak is detected.
    - Should that occur, monitoring frequency must return to monthly until no leaks are detected for two successive months.
  - Alternatively, and following notification to the Secretary, if 2% or fewer valves are found to be leaking after two consecutive quarters, monitoring frequency may be changed to once every six months. If 2% or fewer valves are found to be leaking after five consecutive quarters, monitoring frequency may be changed to annually.
    - Should the percentage of leaking valves exceed 2%, monitoring must be performed monthly.
  - Alternatively, and following notification to the Secretary, no more than 2% of valves may be allowed to leak if performance testing is conducted pursuant to 264.1061 initially, annually, and upon the Secretary's request to ensure that the leak percentage is being met.

    - Should use of this alternative discontinue, written notification to NMED must be made.

- If a leak is detected, repair(s) shall be initiated no later than within 5 calendar days and completed as soon as possible, but no later than 15 calendar days.
    - A delay of repair is allowed if the repair is technically infeasible without shutting down the unit, if the leaking equipment is isolated from the unit and does not contain or contact hazardous waste with greater than or equal to 10% by weight organics, if purged emissions from immediate repair would exceed emissions from delaying repair, and/or if insufficient valve repair supplies exist although adequately stocked normally and the next unit shutdown is within 6 months.

C.4.5 Requirements for Pressure Relief Devices In Light Liquid Service, Flanges and Other Connectors [20.4.1 NMAC § 264.1058]

- Monitoring must be conducted pursuant to 20.4.1 NMAC 264.1063(b) requirements within 5 days of identifying a potential leak by visual, audible, olfactory, or other method.
- If a leak is detected by an instrument reading of 10,000 ppm or greater, repairs shall be initiated no later than within 5 calendar days and completed as soon as possible, but no later than 15 calendar days.
- No monitoring is required for inaccessible, glass, or glass-lined connectors.

C.5 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART CC REQUIREMENTS [20.4.1 NMAC, SUBPART V, PART 264, SUBPART CC]

The hazardous wastes stored in containers that may be subject to 20.4.1 NMAC, Part 264, Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers" based on the applicability criteria specified in 20.4.1 NMAC § 264.1080. Subpart CC standards for containers require that owners or operators shall control air pollutant emissions for containers of hazardous waste subject to this provision.

General inspection provisions detailed in 20.4.1 NMAC § 264.1088 require that the facility develop, implement, and incorporate in the facility inspection plan a written plan and schedule to perform inspections and monitoring of air emission control equipment used to comply with any container requirements.

As detailed in 20.4.1 NMAC § 264.1086 the defined Container Levels that may be present at the storage areas are defined as follows:

Container Level 1- The volume of the container in direct contact with waste is greater than $0.1m^3$ and less than or equal to $0.46m^3$, or the volume of the container is greater than $0.46m^3$ and not in light material service, as defined by 20.4.1 NMAC § 265.1081. The container must also be either: (1) compliant with the applicable Department of Transportation (DOT) regulations (20.4.1 NMAC § 264.1086(f)); (2) equipped with a cover and closure devices that form a continuous barrier so that, when closed, no visible holes, gaps, or open spaces into the interior of the container are evident; or (3) an open-top container with an organic vapor suppressing barrier that precludes exposure of waste to the atmosphere.

Container Level 2- The volume of the container in direct contact with waste is greater than $0.46m^3$ and is in light material service, as defined by 20.4.1 NMAC § 265.1081. The container also must be either: (1) compliant with the applicable DOT regulations (20.4.1 NMAC § 264.1086(f)); (2) capable of operation with no detectable organic emissions as determined by the procedure specified at 264.1086(g); or (3) demonstrated to be vapor-tight within the past 12 months using 40 CFR 60, Appendix A, Method 27 and the procedure specified at 264.1086(h).

C.5.1 Container Level 1 Inspection Requirements

Inspection requirements for Container Level 1 are as follows (20.4.1 NMAC § 264.1086(c)(4)):

- If waste is already in the container when received:
  - On or before the date the container is accepted at the facility, a visual inspection will be performed of the container, cover, and closure devices for visible cracks, holes, gaps, and other open spaces into the interior when cover and closure devices are secured in closed position.
  - If a defect is detected, repair(s) must be initiated no later than within the first 24 hours and completed as soon as possible, but no later than within 5 calendar days.
    - If defect(s) are not completely repaired within 5 calendar days, waste must be removed and the container not used until the defect(s) have been repaired.
- If waste remains in storage for greater than or equal to 1 year:

- A visual inspection of the container will be performed at initial receipt and at least once every 12 months.
- If a defect is detected, repair(s) must be initiated no later than within the first 24 hours and completed as soon as possible, but no later than within 5 calendar days.
    - If defect(s) are not completely repaired within 5 calendar days, waste must be removed and the container not used until the defects have been repaired.

- Covers and closure devices used must be appropriately designed and must be composed of suitable materials to minimize exposure of waste to the atmosphere and maintain equipment integrity (20.4.1 NMAC § 264.1086(c)(2)).
- Covers and closure devices must be installed, secured, and maintained in closed position, except when: adding or removing material; performing routine activities (other than waste transfer) inside the container; operating pressure relief and safety devices to maintain and return container to safe internal pressure, pursuant to 20.4.1 NMAC § 264.1086(c)(3).

C.5.2 Container Level 2 Inspection Requirements

Inspection requirements for Container Level 2 are as follows:

- If waste is already in the container when received (20.4.1 NMAC § 264.1086(d)(4)):
    - On or before the date the container is accepted at the facility, a visual inspection will be performed of the container, cover, and closure devices for visible cracks, holes, gaps, and other open spaces into the interior when cover and closure devices are secured in closed position.
    - If a defect is detected, repair(s) must be initiated no later than within the first 24 hours and completed as soon as possible, but no later than within 5 calendar days.
        - If defect(s) are not completely repaired within 5 calendar days, waste must be removed and the container not used until the defects have been repaired.
- If waste remains in storage for greater than or equal to 1 year (20.4.1 NMAC § 264.1086(d)(4)):
    - A visual inspection of the container will be performed at initial receipt and at least once every 12 months.
    - If a defect is detected, repair(s) must be initiated no later than within the first 24 hours and completed as soon as possible, but no later than within 5 calendar days.

  - If defect(s) are not completely repaired within 5 calendar days, waste must be removed and the container not used until the defects have been repaired.

- Covers and closure devices must be installed, secured, and maintained in closed position, except when: adding or removing material; performing routine activities (other than waste transfer) inside the container; operating pressure relief and safety devices to maintain and return container to safe internal pressure, pursuant to 20.4.1 NMAC § 264.1086(d)(3).
- The process of waste transference in or out of containers must ensure that exposure of hazardous waste to the atmosphere is minimized, in accordance with 20.4.1 NMAC § 264.1086(d)(2).

C.6 INSPECTION AND MONITORING FOR UNITS SUBJECT TO SUBPART DD REQUIREMENTS [20.4.1 NMAC, SUBPART V, PART 264, SUBPART DD]

Inspection and monitoring requirements for units subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart DD [10-01-03], are not applicable to any of the units at LANL.

HAZARDOUS WASTE FACILITY INSPECTION RECORD FORM

[1] FACILITY:	[2] Site ID #:	TREATMENT, STORAGE, OR DISPOSAL UNIT (TSD)	[3] START DATE:	[4] END DATE:

[5] Containers   Landfill   Chemical Treatment   Tank   Miscellaneous Unit (OB/OD, Cementation)

PART I- Enter condition of the item inspected **(**i.e. **OK**, **NA** [Not Applicable], or **AR** [Action Required]**)** in column for day inspected.

ITEM	INSPECTED FOR:	MON	TUE	WED	THU	FRI	SAT	SUN
[6] NO UNIT USE	No waste stored							
[7] NO WASTE HANDLING	No waste handled (see instructions)							
All TSDs								
[8] COMMUNICATIONS EQUIPMENT	Availability and proper operating condition							
[9] WARNING SIGNS	Posted, legible, and bilingual							
[10] SECURITY	Good condition of fences, gates, locks, and other access control equipment							
[11] WORK SURFACES/ FLOORS/ROADS	Absence of conditions that could lead to an accident or spill							
[12] SPILL/FIRE EQUIPMENT	Present, appropriate, and in proper operating condition							
[13] EYEWASHES/ SAFETY SHOWERS	Proper operating condition							
[14] WIND SOCK	Proper operating condition and functional							
[15] SECONDARY CONTAINMENT	Integrity- No standing water/waste, erosion, or signs of a spill							
[16] (UN)LOADING AREA	No spills or deterioration							
[17] RUN-ON/OFF CONTROL	Integrity- no ponding, erosion, or damage							
Container Storage Units and/or Tanks (see instructions)								
[18] COVERS/LIDS OF CONTAINERS	Closed and secured properly							
[19] LABELS	Proper with start date, present & legible							
[20] COMPATIBILITY	Separated according to compatibility							
[21] INTEGRITY	No leakage, corrosion, or damage							
[22] AISLE SPACE/STACKING	Appropriateness and adequacy							

Figure C-1 - Hazardous Waste Facility Inspection Record Form

HAZARDOUS WASTE FACILITY INSPECTION RECORD FORM

FACILITY:	Site ID #:	START DATE:	END DATE:

ITEM	INSPECTED FOR:	MON	TUE	WED	THU	FRI	SAT	SUN
23 PALLETS AND RAISED CONTAINERS	Absence of conditions that could result in failure							
24 TANK SYSTEMS	Discharge controls and fill level and no corrosion or leakage							
Other TSDs								
25 SHAFTS/LANDFILL COVERS	Presence and condition of cover							
26 OPEN BURNING UNITS	Condition of cover, and no erosion, leakage, or damage							
27 OPEN DETONATION UNITS	Unit and vegetation condition and no erosion							
28 CEMENTATION UNITS	Structural integrity and condition of equipment and systems							

	MON	TUE	WED	THU	FRI	SAT	SUN
29 **DATE**							
30 **TIME**							
31 **INSPECTOR(S)**							

Part II- For any AR (Action Required) in PART I, describe below: action required, action taken, status, date, and time of action. Attach additional sheets if necessary. If more than one action is required, number each AR.

32

Part III- Comments.

33

Figure C-1 - Hazardous Waste Facility Inspection Record Form

Instructions for the Hazardous Waste Facility Inspection Record
Treatment, Storage, or Disposal Units (TSDs)

Part I

Weekly and daily inspection of TSDs will be conducted in accordance with the inspection plan in most recent Los Alamos National Laboratory (LANL) General Part B Permit Application or the LANL Hazardous Waste Facility Permit, as appropriate. Not all items in this section will apply to all facilities. An "NA" (not applicable) is required if the item does not apply. Facilities may shade parts of the form to indicate items that need to be completed only on a weekly basis. Holidays and Laboratory closures can also be noted (e.g., by writing "H" (for holidays) or "Closed" in the first box and drawing a line all the way down the page).

1. Location information, including TA, building, room (if applicable), and any other location descriptors that may be necessary (e.g., TA-59-3-114 or TA-59-1-S, Dock).
2. A site identification number is assigned to every facility by the Resource Conservation and Recovery Act (RCRA) compliance personnel. This allows for ease in identification.
3. Start date of Monday for the week of record.
4. End date of Sunday for the week of record.
5. Check the appropriate box for the type of operation. Several boxes may be checked, if necessary, for those locations where inspections are combined on a single sheet. You must have prior approval from RCRA compliance personnel to combine inspections for more than one unit.
6. For container storage units only – "NO USE" may be checked (or marked "OK") if waste was not stored at the unit for the week in question. When this box is checked, the individual responsible for the inspection must only complete this box, the items related to site location (Items 1-5), and the inspector name section for that week (Items 29-31). If any hazardous or mixed waste is subsequently placed at the site for any reason, a full inspection must be performed immediately and then subsequently according to the appropriate inspection plan.
7. a. At a container storage unit if waste is in storage but no waste is handled at the unit for the week– "NO WASTE HANDLING" may be checked, but a weekly inspection in accordance with the appropriate inspection plan must be conducted.
   b. If a treatment unit is not conducting treatment for the week – "NO WASTE HANDLING" may be checked, but a weekly inspection in accordance with the appropriate inspection plan must be conducted.
   c. For a tank storage system unit, if no waste is being stored and the tank system is empty, "NO WASTE HANDLING" may be checked. However, a weekly inspection in accordance with the appropriate inspection plan must be conducted.
8. Communication equipment must be inspected in order to ensure availability and proper operating condition for each piece of equipment (e.g., telephones, radios, and alarms). Equipment must be present in accordance with the appropriate contingency plan.
9. Required signs must be legible and prominently posted in accordance with 40 CFR § 264.14(c) and/or the permit as applicable.
10. Site security must be verified. Items such as fences, gates, locks, and other access control equipment (as appropriate) should be checked for proper operating condition.
11. Roads, process floors, and other work surfaces at TSDs must be inspected for any conditions that could lead to a spill or an accident.
12. Hazardous or mixed waste TSDs must have fire control and spill control equipment. Equipment must be present, in proper operating condition, and appropriate for the material in question. Hose bibs, where present, should be inspected for proper operating condition and adequate pressure. Outdoor fire-water supply systems must be checked for freezing and damage. Equipment must be inspected and present in accordance with the appropriate inspection and contingency plans.
13. Where present, eyewashes and safety showers must be inspected to ensure proper operating condition. Outdoor locations must be checked for freezing.

14. Wind socks, where present at outside TSDs, must be inspected to ensure that they are in proper operating condition and checked for damage.
15. Secondary containment structures for hazardous or mixed waste operations must be inspected to verify proper operating condition and to ensure adequate capacity. Structures must also be inspected for the presence of standing water or hazardous/mixed waste or any other indication of a spill (i.e. discolored vegetation, soil, or concrete). For certain operations, secondary containment includes inspection of gloves, gloveboxes, hoods, and ventilation systems. For locations where inflatable "Porta Berms" are used, inspectors must ensure that they are adequately inflated. All monitoring and leak detection systems must also be checked.
16. Loading and unloading areas must be inspected daily when in use for signs of damage or deterioration that may lead to an accident or spill. This includes asphalt covered areas and areas where containers or tanks are handled or the contents thereof are transferred.
17. Run-on and runoff controls, wherever present, must be checked. The integrity should be inspected by looking for signs of damage, erosion, ponding, or any other conditions that could lead to a spill or an accident.
18. All tanks and containers used for storing hazardous or mixed waste must have the cover or lid securely in place. Containers are not considered to be closed until the lid/cover is fastened in the manner the manufacturer originally intended. However, the lid may be off of a tank or container while waste is being placed into or removed from a container.
19. All containers and tanks containing hazardous or mixed waste must be labeled with the words "HAZARDOUS WASTE," and EPA Hazardous Waste Numbers or hazardous waste constituents. They must also be marked with a legible accumulation start date. All containers must be dated when they arrive at the facility and no hazardous or mixed waste may be stored for over one year, unless specifically exempted.
20. All hazardous or mixed waste containers holding materials that may be incompatible with any other materials at that location must be separated from those materials by dikes, berms, or other physical barriers to prevent a possible reaction.
21. All containers and tanks must be checked for structural integrity, leakage, corrosion, or damage that may impact integrity. This includes checking the condition of all construction materials, fixtures, seams, and auxiliary equipment. There are special inspection criteria for tank systems (see Item 24 below).
22. Adequate aisle space must be maintained to allow for inspection and for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency. Containers of hazardous and mixed waste must be stored in a manner that ensures a minimum 2-foot aisle space and containers may not be stacked more than 3 high, unless otherwise specified for the facility (i.e. some units within the LANL Hazardous Waste Facility Permit must have an aisle space of 28 inches and only 55 gallon drums may be stored three high). Please consult RCRA compliance personnel for permit related questions.
23. Hazardous or mixed waste containers stored at TSDs must be on pallets, elevated, or otherwise raised to be protected from contact with accumulated liquid.

TANKS SYSTEMS:

24. For tank systems used for treatment or storage of hazardous or mixed waste, all aboveground portions of the tank system, including any and all ancillary plumbing, must be inspected for signs of leaking, corrosion, deterioration, or improper operation. Tanks must be operated with a minimum freeboard of 6 inches. If the tank system includes discharge controls, overtopping controls, tank level alarms, or other monitoring equipment, including leak detection equipment, all controls and relevant data must be checked to ensure they are operating properly and that operation is within design specifications for the system.

SHAFTS:

25. Shafts used for retrievable storage should have their covers securely in place and the surrounding area should show no evidence of erosion. Disposal shafts and shafts used for retrievable storage should have their covers securely in place and, during waste handling operations, guard rails must be installed and in good condition. Landfill covers must be inspected at least weekly and after storms for evidence of erosion, subsidence, and water intrusion.

OPEN BURNING UNITS:

26. Open burning units must be inspected for deterioration, leakage, vegetation in the immediate vicinity that could catch fire, and assure that the unit is covered when not in use. Inspectors must also look for explosives and debris not consumed during the burn.

OPEN DETONATION UNITS:

27. Open detonation units must be inspected for deterioration, leakage, or vegetation in the immediate vicinity that could catch fire. Inspectors must also look for explosives and debris not consumed by the detonation.

CEMENTATION UNITS:

28. The structural integrity and condition of equipment and systems must be inspected on cementation units. Units must also be inspected for signs of leaking, corrosion, deterioration, or improper operation.

FOR ALL INSPECTIONS:

29. Record of the date of the current inspection. Only one date is given for each inspection, whether a team or an individual performs the inspection.
30. Record of the time of the current inspection. Only one time is given for each inspection, whether a team or an individual performs the inspection.
31. Legible and/or printed name of each inspector involved in the current inspection.

Part II

List any action required.

32. Document any action taken immediately and express any plans for future action to be taken. Also, ensure that previous ARs are closed out with completed actions described. If the AR has not been resolved, ensure that it is carried over to the current inspection. Status should be provided for both open and closed items. If necessary, attach additional sheets to inspection record form to efficiently cover the action taken or required. Initial any information or comments added, and if more than one action is required or conducted, assign a number to each AR.

Part III

Identify any comments.

33. Document informational comments and any status associated with the current inspection that do not require specific regulatory action or remedies.

APPENDIX D

PERSONNEL TRAINING PLAN

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
DOE	U.S. Department of Energy
EDS	Employee Development System
EM&R	LANL's Emergency Management and Response
EMP	Emergency Management Plan
ES&H	environment, safety, and health
WS	Waste Services
KSL	KBR-Shaw-LATA
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
NNSA	National Nuclear Security Administration
OJT	on-the-job training
RCRA	Resource Conservation and Recovery Act
TSF	treatment and storage facility
USC	United States Code

APPENDIX D
PERSONNEL TRAINING

This section describes the personnel training program for Los Alamos National Laboratory (LANL) treatment and storage facility (TSF) workers. Training requirements for treatment, storage, and disposal facility personnel are specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 264.16, revised October 1, 2003 [10-01-03], and are included in this document, as required by 20.4.1 NMAC § 270.14(b)(12) [10-01-03]. The primary objective of the training program is to prepare personnel to operate and maintain safely those areas managing hazardous and/or mixed waste, in accordance with 20.4.1 NMAC, Subpart V, Part 264 [6-14-00]. This training program applies to all employees of the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy (DOE), Los Alamos National Security, LLC (LANS) and any subcontractors who work regularly at LANL TSFs and manage hazardous and/or mixed waste. The degree of training varies with the job duties.

D.1 HAZARDOUS AND MIXED WASTE MANAGEMENT/RESPONSIBILITIES

Waste management activities and responsibilities at specific hazardous and/or mixed waste management units are managed by the appropriate LANL division or group. Waste management personnel within LANL are responsible for waste management activities at LANL. The hazardous waste compliance personnel are responsible for providing waste management regulatory guidance to all LANL personnel and operations. Other personnel at LANL that may provide assistance in various waste management activities are discussed in the following paragraph and in Appendix E of this document.

Laboratory-contracted support services (e.g., KBR-Shaw-LATA [KSL]) provide trained personnel to assist in waste-handling activities. LANL health physics, industrial hygiene, environmental compliance, emergency response, and radiation protection personnel are trained in their respective specialties to provide emergency response support. LANL security personnel are responsible for LANL security, and provide workers trained in traffic and site-access control.

LANL emergency response personnel provide emergency planning and response at LANL, and have the overall responsibility for LANL's Emergency Management Plan (EMP) training. Training personnel are responsible for the analysis, design, development, and delivery of LANL-wide environment, safety, and health (ES&H) training. Courses on hazardous and/or mixed waste are designed with substantial input from hazardous waste compliance personnel, waste management personnel, and other subject matter experts, as appropriate.

D.2 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES [20.4.1 NMAC § 270.14(b)(12) AND 20.4.1 NMAC § 264.16(a), (b), (d), AND (e)]

The training program instituted at LANL includes a combination of LANL-wide courses, facility-specific training, and on-the-job training (OJT). LANL-wide courses are provided on-site or through external vendors and are usually classroom-based. Facility-specific training may be developed and delivered within a particular TSF, and OJT consists of supervised and documented training focused primarily on procedures performed by individual workers. Each of these types of training is described briefly in Sections D.2.1 through D.2.3. All LANL employees and LANL contract and support personnel who handle hazardous and/or mixed waste at TSFs receive the appropriate level of training within six months of their date of hire or transfer for work at a TSF. Personnel will not work in unsupervised waste handling positions at TSFs until they have successfully completed the appropriate level of training for their positions and responsibilities.

Records of LANL-wide training currently sponsored or administered by LANL's central training personnel are entered by each respective group into the Employee Development System (EDS), the official LANL training database. These records document that the required training has been successfully completed by the worker. Training records of former workers are kept for at least three years from the date that they last worked at the TSF. It is required that records documenting successful completion of facility-specific, on-the-job, or externally provided training be kept by the sponsoring LANL organization. LANL will maintain, at a minimum, hard or electronic copies of TSF training records for currently employed workers until the TSF closes.

Table D-1 presents components of the LANL-wide training program as administered through LANL's central training group. This table includes a listing of the relevant training courses, a summary of topics, and a designation of the relevant courses for each job category. Categories of workers presented in Table D-1 include TSF hazardous/mixed waste workers, managers and supervisors of TSF hazardous/mixed waste workers, emergency responders, and uncontrolled area potential release site workers. Table D-2 summarizes the components of facility-specific training and OJT that workers receive, as applicable. Each training element has been designed to ensure that every worker involved in hazardous and/or mixed waste handling operations is properly trained in the procedures relevant to the positions in which they are employed. Tracking the completion of training is possible through the EDS training plans. If a worker is no longer involved in hazardous and/or mixed waste handling operations, continued training to meet the components of the relevant hazardous waste management program is not required.

TSF Hazardous/Mixed Waste Workers are responsible for handling hazardous/mixed wastes at a TSF. In addition, they are responsible for assisting in TSF spill and emergency response activities, as required.

Managers and Supervisors of TSF Hazardous/Mixed Waste Workers are directly responsible for day-to-day operations related to TSF waste management activities. They are also responsible for assuring that personnel safety and training requirements are met.

Emergency Responders are trained emergency response personnel at respond to emergencies (e.g., spills, fires, explosions) involving hazardous and/or mixed wastes. Emergency Responders also provide support for emergency response activities.

Uncontrolled Area Potential Release Site Workers conduct investigations and remedial activities at potential release sites. They are also responsible for proper waste management from generation to disposal, including waste characterization, treatment, and storage.

Training materials of LANL-wide training courses are on file at LANL's Training Center and are available for review by all hazardous/mixed waste management and handling personnel, emergency response personnel, and regulatory agencies. Course content will be reviewed on a regular basis and updated as required to keep materials current with hazardous waste management regulations. Alternative training (e.g., paper-based self-study courses, web-based training) may be taken to meet specific training requirements. Such alternate forms of training must be approved by LANL's central training personnel and be equivalent in content to more conventional classroom-based training courses. Files listing the requisite skills, education, and training for workers who handle hazardous and/or mixed waste and the duties and responsibilities for each job description, as well as the name of each worker filling a job description, are maintained at LANL, as required by 20.4.1 NMAC § 264.16(d)(2) [10-01-03].

D.2.1 LANL-Wide Courses

Hazardous waste management courses for TSF personnel include Waste Generation Overview, Live Training, Resource Conservation and Recovery Act (RCRA) Personnel Training, and RCRA Refresher Training. Additional LANL-wide courses may be required for specific job functions.

The RCRA Personnel Training course provides an overview of state and federal hazardous waste management regulations and emphasizes compliance with the RCRA requirements that apply to job-related activities, such as the safe handling of hazardous and mixed waste. Instructors are trained in hazardous and mixed waste management programs and procedures and in RCRA *(42 United States Code [USC] § 6901 et seq.)*. Training personnel, with guidance from hazardous waste compliance personnel, provide an annual refresher of applicable hazardous waste management requirements. TSF personnel who handle hazardous and/or mixed waste and/or clean up spills or releases of hazardous and/or mixed waste at TSFs and the managers and supervisors of these workers also receive instruction on appropriate topics listed in Table D-1. In addition, personnel responsible for shipping or transporting hazardous and/or mixed waste require supplementary training, as necessary.

D.2.2 Facility-Specific Training [20.4.1 NMAC § 264.16(a)(3)]

Waste-handling personnel are required to satisfy facility-specific training at their particular work locations, as appropriate. Table D-2 addresses program requirements that ensure hazardous and mixed waste management and handling personnel are knowledgeable of the specific requirements for their particular facilities and are able to respond effectively to emergencies. Personnel will become familiar with emergency procedures, equipment, and systems at their particular facility, including emergency and monitoring equipment use, inspection, repair, and replacement, as appropriate. In addition, they will receive instruction on contingency plan contents and implementation (as they apply to their particular facility) including, but not limited to, emergency response, communications or alarm systems, evacuation, response to fires and explosions at their facility, key parameters for automatic waste-feed cutoff systems, shutdown of facility operations, and response to groundwater contamination incidents.

D.2.3 On-the-Job Training

Supervised and documented OJT may be developed and administered by supervisors or other subject matter experts capable of evaluating worker proficiency and determining appropriate training for the procedures required of each function-specific position. OJT topics may include implementation of facility-specific procedures, maintenance of operating records, reporting requirements, and TSF-specific inspection requirements. TSF emergency response personnel receive TSF-specific training regarding emergency response and shutdown procedures at the TSF to which they are assigned.

D.2.4 Training Coordinator [20.4.1 NMAC § 264.16(a)(2)]

The LANL central training group's leader directs the LANL-wide ES&H training program. The group leader (or designee) serves as the Training Coordinator for LANL-wide waste management training. The Training Coordinator is trained in the operation of hazardous and mixed waste management facilities, waste management practices, and emergency procedures and is responsible for coordinating training courses.

D.3 EMERGENCY TRAINING [20.4.1 NMAC § 264.16(a)(3) AND (c)]

If called upon by the EM&R personnel, additional non-LANL emergency response personnel (e.g., KSL, PTLA, LA County fire department) may assist the LANL Incident Commander at the scene of a hazardous or mixed waste emergency. These workers are trained in their specialties (e.g., heavy equipment operation, hazardous material cleanups, traffic control, and security). At all times during an emergency, activities are coordinated by the Incident Commander detailed by the Incident Command System or by the designated Emergency Manager, as appropriate. Appendix E of this document (the Contingency Plan) provides a more detailed discussion of emergency procedures, personnel, and equipment.

To ensure maximum protection of life, property and to mitigate the consequences of an emergency situation, TSF personnel involved in waste handling and emergency response must be knowledgeable in procedures applicable to building and operating area emergency procedures. These workers receive training in TSF-specific emergency procedures or participate in the LANL-wide emergency training program. Group leaders and immediate supervisors are responsible for ensuring that education and training in TSF-specific emergency procedures are provided to all personnel under their supervision. Training in TSF-specific emergency procedures is administered by the operating group. Periodic training exercises may be used to familiarize workers with emergency procedures. Training may also be provided to workers through instructional displays or presentations and discussions in safety meetings.

Immediate supervisors ensure that each new or transferred worker is trained to the general and specific emergency procedures related to the site-specific work area. The immediate supervisor also ensures that each worker is apprised of any changes to emergency procedures and that each worker is provided with an annual refresher of these procedures. The organization that develops and delivers TSF-specific emergency training maintains these training records.

Specialized training is given to personnel assigned special functions or specific emergency duties. Emergency response personnel are required to attend training on the implementation of the RCRA Contingency Plan (Appendix E), spill response, and Occupational Safety and Health Administration emergency response provisions. The EM&R personnel provides training related to implementing LANL's EMP. In addition, TSF waste management and handling personnel participate in a training program in which they are instructed in emergency procedures pertinent to their work areas. The operating group is responsible for providing this site-specific instruction.

D.4 IMPLEMENTATION OF TRAINING PROGRAMS [20.4.1 NMAC § 264.16(b) AND (c)]

Waste Generation Overview Live is an introductory course that provides an overview of federal and state waste management regulations including Laboratory policies and procedures for waste management operations. The training addresses the information required to identify and properly manage wastes that are subject to hazardous waste regulations in 20.4.1 NMAC, Subpart II [10-01-03].

In addition to Waste Generation Overview Live, all TSF workers who handle hazardous and/or mixed waste are required to complete RCRA Personnel Training and annual RCRA refresher courses. These refresher courses are intended to update personnel on LANL procedures and changes in RCRA *(42 USC § 6901 et seq.)* provisions and 20.4.1 NMAC regulations. These courses also provide them with an overview of their introductory training. Line managers and group leaders are responsible for ensuring that personnel participate in the appropriate introductory and annual training courses.

Table D-1

Los Alamos National Laboratory-Wide Training Program Outline

Courses[a]	TSF[b] Hazardous/Mixed Waste Worker	Manager/Supervisor of TSF Hazardous/Mixed Waste Workers	Emergency Responder	Uncontrolled Area Potential Release Site Worker
HAZWOPER[c]: First Responder (Operations Level) (provides an overview of hazardous materials emergency response, including recognition and identification of hazardous materials and associated risks, required actions, and relationships with other emergency responders)			X[d]	
HAZWOPER: General Site Worker (40 hours) (provides general information on hazardous waste operations and emergency response for general site workers engaged in corrective action, remediation, or decontamination and decommissioning activities)				X
HAZWOPER: Refresher (provides general information on hazardous waste operations)			X	X
RCRA[e] Personnel Training (includes an overview of the Code of Federal Regulations, Title 40, Parts 260-265, 268; the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (10-01-03); Department of Transportation shipping regulations; internal and external protocol for facility inspections; operating equipment, communication systems, security systems; contingency plan; and emergency equipment use, inspection, and repair)	X	X	*[f]	*
RCRA Refresher Training (includes regulatory and legislative updates, occurrence reports and lessons learned, audit findings, modification/review of the contingency plan; provides required retraining)	X	X	*	*

Table D-1 (Continued)

Los Alamos National Laboratory-Wide Training Program Outline

Courses[a]	TSF[b] Hazardous/Mixed Waste Worker	Manager/Supervisor of TSF Hazardous/Mixed Waste Workers	Emergency Responder	Uncontrolled Area Potential Release Site Worker
Waste Generation Overview Live (includes waste management regulations and policies, definition of hazardous waste, waste minimization, cycle of waste management at Los Alamos National Laboratory, storage and disposal)	X	X	X	X
Respirators: Air-Purifying (provides required annual retraining for operation and inspection of device, changing filters, donning and doffing)	*	*	X	*
Respirators: Self-Contained Breathing Apparatus (provides required annual retraining for operation and inspection, changing compressed air bottles, donning and doffing, safety features, care and cleaning, fitting)	*	*	X	*

[a] Additional training courses (not listed in this attachment) may also be taken by personnel depending on the types of hazards (e.g., chemical) associated with a particular job description.
[b] TSF = Treatment and storage facility
[c] HAZWOPER = Hazardous Waste Operations and Emergency Response
[d] X indicates a required course.
[e] RCRA = Resource Conservation and Recovery Act
[f] * indicates that a course may be required for specific job tasks and/or work areas.

Table D-2

Outline of Facility-Specific and On-the-Job Training for Treatment and Storage Facility Operations

Facility-specific and/or on-the-job training (OJT) is provided to treatment and storage facility (TSF) workers to ensure that operations are performed in a safe manner and that actual job tasks are conducted in accordance with safe operating procedures.

Facility-specific training will include, as applicable, the following topics:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Response to groundwater contamination incidents
- Shutdown of operations.

OJT will include the following topics, as applicable:

- Implementation of facility-specific procedures
- Maintenance of operating records
- Reporting requirements
- TSF-specific inspection requirements.

OJT and facility-specific training must be documented by the sponsoring organization and training records must be maintained for a minimum of three years from the date that the trainee last worked at the TSF.

APPENDIX E

CONTINGENCY PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
BEP	building emergency plan
CAS	Central Alarm Station
DOE	U.S. Department of Energy
EM&R	Emergency Management and Response
EMP	Emergency Management Plan
EOC	Emergency Operations Center
ENV	Environmental Protection Division
HAZMAT	Hazardous Materials
IC	Incident Commander
ICS	Incident Command System
KSL	KBR-Shaw-LATA
LACFD	Los Alamos County Fire Department
LACPD	Los Alamos County Police Department
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
NAWAS	National Warning System
NIIMS	National Interagency Incident Management System

LIST OF ABBREVIATIONS/ACRONYMS (continued)

NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
PA	public address
PPE	personal protective equipment
PTLA	Protection Technology Los Alamos
TA	technical area
TRUWF	Transuranic Waste Facility

APPENDIX E
CONTINGENCY PLAN

This appendix presents general contingency measures applicable to all hazardous or mixed waste units at Los Alamos National Laboratory (LANL) and specific information for the proposed container storage/treatment unit to be located at the Transuranic Waste Facility (TRUWF) at Technical Area (TA) 52. This Contingency Plan is intended to meet the requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V, Part 264, Subpart D, revised October 1, 2003 [10-01-03], and 20.4.1 NMAC § 270.14(b)(7) [10-01-03], for hazardous waste treatment and storage facilities. In addition, this plan is consistent with the LANL Emergency Management Plan (EMP) (LANL, 2002), prepared by LANL Emergency Management and Response (EM&R) personnel. The provisions of this plan will be carried out immediately to minimize hazards whenever there is a fire, explosion, or release of hazardous or mixed waste or hazardous or mixed waste constituents that could threaten human health or the environment, as required by 20.4.1 NMAC § 264.51(b) [10-01-03]. Other individual facilities at LANL may have their own facility-specific emergency plans and/or procedures to follow in the event of a fire, explosion, or release of hazardous and/or mixed waste.

E.1 HAZARDOUS AND MIXED WASTE EMERGENCY RESPONSE RESOURCES [20.4.1 NMAC §§ 264.52(c) AND 264.53]

The responsibility for hazardous and mixed waste emergency incidents at LANL resides with EM&R personnel. During an emergency situation, line management (i.e., the Group Leader of the affected area) works with the Duty Emergency Manager from EM&R personnel. The Emergency Manager has primary responsibility for managing emergency response operations, making appropriate notifications, activating the emergency response organizations, and proceeding to the scene. The Emergency Manager has authority to assume the role of Incident Commander (IC) during an emergency and typically assumes full responsibility for management of the emergency response operations at the scene. (Personnel from other organizations, such as the Federal Bureau of Investigation or the Los Alamos County Fire Department [LACFD], may also assume the role of IC, depending upon the type of emergency and responding organizations.) Additional LANL resources that may provide assistance in an emergency include personnel from health physics, industrial hygiene, environmental compliance, emergency response, and radiation protection groups. These personnel as well as other resources are discussed in Sections E.1.2, E.1.3, and E.1.6.

Laboratory-contracted support services and other agencies are also available for assistance during emergencies. These are discussed in Section E.1.5 and include the contracted services of Protection Technology Los Alamos (PTLA) for security and the LACFD. Facility maintenance and heavy equipment operation are provided by KBR-Shaw-LATA (KSL). These contracted services, if changed, will be replaced and/or supplemented with functionally equivalent contracted services required to assume the same duties and responsibilities described in this section. Other outside response agencies are discussed in Section E.1.7 and include the Los Alamos County Police Department (LACPD) and the Los Alamos Medical Center (LAMC). The LACPD and the LAMC each provide assistance under a memorandum of understanding with the U.S. Department of Energy (DOE).

The Laboratory, as required by DOE and the State of New Mexico, uses the Incident Command System (ICS) in response to all emergencies. The ICS is based on the on-scene management structure protocols of the National Interagency Incident Management System (NIIMS). The NIIMS is a national standard that provides consistency in terminology/methodology and allows for an integrated emergency response both locally and nationally, if necessary. Consequently, this Contingency Plan may undergo modification.

The IC (e.g., Duty Emergency Manager) coordinates all groups and agencies responding to the emergency and personnel operating at the scene using the ICS. The general emergency notification structure, illustrated on Figure E-1, is designed to expand and contract, as appropriate, to include the response groups/agencies needed to address any particular emergency.

The IC may appoint and utilize a network of support personnel to assess, plan for, and mitigate emergencies. These personnel can include, but are not limited to, a Safety Officer, a Public Information Officer, and a Liaison Officer that report directly to the IC and are responsible for issues related to safety, information, and the interaction of various groups associated with the overall emergency. Also reporting directly to the IC are an Operations Section Chief, Logistics Section Chief, Planning Section Chief, and an Administrative Section Chief. The Operations Section Chief oversees the Fire Branch and the Emergency Medical Services Branch, and is responsible for the actual emergency response. The Logistics Section Chief is responsible for providing support personnel and equipment necessary for the emergency response. The Planning Section Chief is responsible for planning the active mitigation and recovery for the emergency. The Administrative

Section Chief is responsible for keeping records of expenditures. In some instances, some or all of these positions may be activated, as the emergency warrants. During an emergency at LANL, assistance may be provided to the IC and the IC's appointees by a large variety of response groups/agencies. The responsibilities and/or assistance available from the various response groups/agencies are listed in Table E-1 and discussed briefly in Sections E.1.2 through E.1.7.

A copy of this Contingency Plan and any revisions will be provided to each of the emergency response groups/agencies (including the LACPD, LACFD, and LAMC). LANL's hazardous waste compliance personnel are responsible for the controlled distribution of this plan. Amendments to this plan are discussed in Section E.12.

E.1.1 Emergency Management and Response Office [20.4.1 NMAC §§ 264.52(d) and 264.55]

The Director of LANL has delegated the authority and responsibility for administering and implementing LANL's emergency management program to the Emergency Response Division, which includes EM&R personnel. EM&R personnel coordinate and issue LANL's EMP and provide response coordination for emergencies. EM&R personnel also provide a 24-hour Duty Emergency Manager to respond to emergencies, including hazardous and mixed waste releases. The LANL Emergency Manager is the functional equivalent of the Emergency Coordinator (20.4.1 NMAC § 264.55 [10-01-03]). EM&R personnel maintain an Emergency Operations Center (EOC) in a ready condition, should a center be required. The primary EOC is located at TA-69, Building 33 (TA-69-33). An alternate EOC is located at TA-49-113. Should an EOC be activated during an emergency, additional emergency personnel can be requested by the IC through the EOC.

Assignment as the Duty (i.e., primary) Emergency Manager is rotated. The Duty Emergency Manager can be reached 24 hours a day by calling the EM&R phone number at 667-6211 or the Central Alarm Station (CAS) operator (911).

The Duty Emergency Manager will respond to emergency incidents involving the release of hazardous or mixed waste to the environment, including spills, fires, and explosions. With input from the appropriate LANL groups, the Duty Emergency Manager will initially assess the possible hazards to human health or the environment and, if assuming incident command, will use whatever response personnel and/or emergency equipment necessary to control and contain the waste. In the event of an emergency, the Emergency Manager typically becomes the IC with full responsibility for field activities (including safety, operations, and planning, or establishing these positions within the ICS). As described previously, the exception to this is when on-site personnel can adequately address the emergency and maintain incident command internally. At the scene of the emergency, the IC will assemble the ICS, as required, for response to the emergency.

The Duty Emergency Manager responding to an emergency will have access to a copy of the appropriate building emergency plan(s) (BEP) for the area in which the incident is occurring. These plans are maintained by the facility manager where a waste management unit is located and are available at the EOC at TA-69; they are also located on site for use by emergency response personnel. The various response groups will obtain specific information relating to the facilities involved (including the layout of all affected buildings; the location of evacuation routes, equipment, and personnel; properties of the materials/wastes managed at the facility; and the hazards associated with these materials/wastes) from the BEP(s) and other site-specific information.

Listed below is the name, address, and phone number of the current Primary and Alternate Emergency Coordinators, as required by 20.4.1 NMAC § 264.52(d) [10-01-03].

Primary
Brenda Andersen
3926 A Alabama
Los Alamos, NM 87544
(H) 505-662-4173
(W) 505-667-6211

Alternates
Manny L'Esperance
13 Pasel Paltron
Los Alamos, NM 87544
(H) 505-455-9138
(W) 505-667-6211

Roy Van Tiem
114 Azure Drive
Los Alamos, NM 87544
(H) 505-672-6296
(W) 505-667-6211

Ruth Larkin
315 Joya Loop
Los Alamos, NM 87544
(H) 505-672-9860
(W) 505-667-6211

To assure timely notifications and immediate response during an emergency, one must call 911 or

667-6211 to obtain the on-call Duty Emergency Manager.

E.1.2 Hazardous Materials Response

The Hazardous Materials Response (HAZMAT) Team is responsible for the aggressive mitigation of chemical, radiological, hazardous waste, and mixed waste emergencies, including field decontamination of responders and response equipment. At the request of the IC, the HAZMAT Team may provide limited field decontamination support for victims. The HAZMAT Team is capable of providing a decontamination station at the scene of a hazardous material incident to process people working in a contaminated area and is prepared to perform decontamination of personnel. LANL standards require that the HAZMAT Team meet the training criteria for emergency response personnel specified in the Code of Federal Regulations, Title 29, §1910.120(q)(6)(iii), (iv), and (v). The HAZMAT Team acts as part of the ICS reporting through the HAZMAT Supervisor via the Operations Section Chief. The LANL HAZMAT Supervisor coordinates the HAZMAT Team and radiological field monitoring activities.

During an emergency response, the HAZMAT Team may also provide site field monitoring to determine the nature and extent of contamination, provide information on correct handling of chemicals, make recommendations on protective clothing and equipment, and provide exposure and treatment information to responders. To operate effectively, the HAZMAT Team may obtain resources from environmental monitoring groups, such as health physics and industrial hygiene personnel.

E.1.3 Environmental Protection Division Response Groups

At the scene, representatives and technical advisors from environmental protection groups and other response personnel are coordinated by the IC. In addition to their post-emergency duties, they may also be responsible for on-scene emergency operations such as planning. Depending on the type of emergency and the associated hazards, an individual from the most relevant group in the Environmental Protection Division (ENV) will assume the position of the Environmental Safety and Health Advisor, will provide technical support, and will ensure LANL compliance with applicable federal, state, and local regulations.

E.1.3.1 Ecology Personnel

Ecology personnel provide field surveys of soil, foodstuffs, and biota to determine environmental effects of exposure after an emergency.

E.1.3.2 Meteorology and Air Quality Personnel

Meteorology and air quality personnel provide field surveys of air to determine environmental impacts and dose equivalent to members of the public after a radiological emergency. In addition, they provide expertise in meteorology to project short- and long-term environmental effects of emergency conditions.

E.1.3.3 Hazardous Waste Compliance Personnel

The hazardous waste compliance personnel provide guidance on regulatory requirements for proper treatment, storage, and transportation of hazardous and mixed wastes to other LANL groups. After an emergency, hazardous waste compliance personnel may provide field sampling (e.g., of soil, spills, or potentially hazardous waste) to determine environmental effects of exposure.

E.1.3.4 Water Quality and Hydrology Personnel

After an emergency, the water quality and hydrology personnel provide sampling of surface water runoff and sediments to determine environmental effects of an emergency and perform assessments for regulatory reporting requirements. Personnel also provide expertise in hydrogeology to establish short- and long-term environmental effects of emergency conditions.

E.1.4 Other LANL Response Resources

Emergency response personnel from the each of the groups that operated hazardous waste management units at LANL have been trained to respond to emergencies at that facility.

E.1.5 Contracted Response Groups

Contracted response groups' representatives may report directly to the IC Post, if requested. If the IC deems it necessary, the IC may designate an Operations Section Chief to aid in the coordination and direction of these groups. In addition, contracted response groups may report to a staging area, with a representative going either to the IC Post or, if activated, to the EOC.

E.1.5.1 Protection Technology Los Alamos

PTLA is the subcontractor for LANL security and provides this service under contract to LANL. During an emergency, PTLA activities include maintaining security, directing traffic within LANL, and controlling access to the emergency scene. PTLA maintains the necessary equipment (such as crowd-control equipment and patrol vehicles) to perform these functions.

E.1.5.2 KBR-Shaw-LATA (KSL)

KSL provides a maintenance support force under contract to LANL. This support force is under LANL's direction in an emergency. KSL also provides a representative to LANL in the event of an emergency and participates, as necessary, in post-emergency cleanup under the direction of a Recovery Manager designated by the IC. The duties of the Recovery Manager are discussed in Section E.10.

E.1.5.3 Los Alamos County Fire Department

The LACFD provides fire protection and ambulance coverage for the residential communities of Los Alamos and White Rock and for LANL. In the case of an emergency within LANL, the LACFD coordinates fire suppression and Emergency Medical Services. The IC retains overall responsibility for the emergency response effort.

E.1.6 LANL Support Groups

Radiation Protection Personnel

The radiation protection personnel provide to perform routine site evaluation and monitoring to determine radiological conditions in facilities. The radiation protection personnel also provide guidance on radiological decontamination. In addition, this group augments the assessment and monitoring functions of the HAZMAT Team.

E.1.6.1 Occupational Medicine Personnel

LANL maintains its own medical facility operated by occupational medicine personnel. Occupation medicine personnel provide appropriate medical treatment for occupation-related illnesses and injuries and monitors employees to assess the effectiveness of health protection programs. In addition to promoting early identification and prevention of illnesses or injuries that may arise from exposures to hazardous or radioactive materials, occupational medicine personnel maintain records of the health status of employees and related occupational medicine activities.

Although occupational medicine is not routinely involved with on-scene emergency response, the group maintains a central medical facility with a fully equipped emergency room and decontamination facilities at TA-3, Building 1411. The location of this and other emergency facilities are shown on Figure E-2. Medical staff at these facilities includes physicians, physician's assistants, nurses, technicians, and counselors. All full-time physicians and nurses receive radiation accident training. Occupational medicine personnel also maintain access to a database that provides the clinical staff with timely toxic exposure and treatment information.

E.1.6.2 Industrial Hygiene and Safety Personnel

Industrial hygiene and safety personnel assist medical personnel with its ability to obtain additional exposure and treatment information. In addition, industrial hygiene personnel maintain computer access to the National Institute of Occupational Safety and Health Technical Information Center and the Registry of Toxic Effects of Chemical Substances. During routine operations, these personnel perform site evaluations and field testing to determine the nature and extent of chemical contamination and specify protective clothing and equipment.

E.1.7 Outside Response Agencies

During an emergency, outside response agencies report directly to the IC. An Operations Section Chief, designated by the IC, may aid in coordinating and directing the groups responding to an emergency.

E.1.7.1 Los Alamos County Police Department

The LACPD may assume IC under unique circumstances, but usually has only minimal interaction with LANL in an on-site emergency. This interaction normally involves traffic control on DOE roads with public access, handling criminal activity, and criminal investigations.

E.1.7.2 Los Alamos County Emergency Management Coordinator

Los Alamos County has an agreement with LANL's EM&R Office to provide assistance in certain emergency situations. If an emergency occurs on LANL property that may affect the communities of Los Alamos and White Rock, EM&R personnel will notify the Los Alamos County Emergency Management Coordinator, who will coordinate necessary emergency actions throughout the county.

E.1.7.3 Los Alamos Medical Center

LANL maintains a fully equipped decontamination room adjacent to the emergency room at LAMC. In the event that a case is sent to LAMC, support for the emergency room staff is provided by occupational medical personnel. Industrial hygiene and safety and radiation safety personnel also provide assistance to the emergency room staff; assistance from additional LANL resources is provided, as necessary. Assistance is coordinated through EM&R personnel.

E.2 EMERGENCY EQUIPMENT AND COMMUNICATIONS [20.4.1 NMAC § 264.52(e)]

E.2.1 Emergency Equipment

20.4.1 NMAC, Subpart V, Part 264, Subpart D [10-01-03], requires a listing of all emergency response equipment available that can be used in the event of an emergency. Table E-2 lists emergency equipment available for use at any of LANL's hazardous or mixed waste management units. The list includes emergency equipment available in the HAZMAT vehicles and trailers as well as supplemental emergency equipment maintained by the LACFD, KSL, and occupational medicine personnel. A list of emergency equipment that will be made available for use at the proposed TRUWF facility is presented in Table E-3. Emergency equipment listed in Tables E-2 and E-3 may be replaced and/or upgraded with functionally equivalent components and equipment, as necessary, for routine maintenance and repair.

E.2.2 Emergency Communications [20.4.1 NMAC § 264.56(a)]

Effective emergency response at LANL requires an efficient communication system that will integrate required personnel into the emergency response. The initial phase of an emergency may involve a small number of individuals at the affected area, require notification of the Duty Emergency Manager, and utilize local communication equipment and/or systems. When responding to hazardous and/or mixed waste emergencies, EM&R personnel can provide communications between response units and emergency organizations.

E.2.2.1 Central Alarm Station

The LANL CAS is manned by PTLA or security personnel 24 hours a day and is equipped with telephones (including direct-line telephones), medium- and short-range radios, a National Warning System (NAWAS) station, and an emergency power system. The fire alarm board at the control room gives the location of automatic and manual fire alarm equipment. The CAS receives alarms from several sources and, in turn, notifies the Duty Emergency Manager of a hazardous or mixed waste emergency. Sources include:

- Telephone communication (911)
- Automatic fire alarms
- Manual pull alarms
- Computer interface (to warn of critical events at selected facilities)
- Security alarms
- Radio communications.

Upon receipt of an alarm, the CAS operator notifies the LACFD and the Duty Emergency Manager. The Emergency Manager, the EOC communicator, and/or the CAS operator may request emergency response groups to respond. Should the LANL 911 system fail, the Los Alamos County System, located at the LACPD Station, will be used to activate emergency response groups.

E.2.2.2 Power Dispatch

The Power Dispatch is maintained 24 hours a day. Alarms at this facility are connected to LANL experiments, equipment, and/or buildings to record outages and hazardous conditions. Any conditions that activate these alarms will be reported immediately to the building management or to the CAS operator for notification and response.

E.2.2.3 Additional Communication Systems

Internal communication systems at LANL include:

- The Centrex telephone system
- A telephone paging system
- A variety of frequency modulated very high frequency simplex repeater systems, including:
    - Multiple base stations
    - Mobile and hand-held units
    - Links to New Mexico public safety agencies
- An ultrahigh frequency radio system, including:
    - Multiple antenna sites
    - Mobile and base units
    - Links with the LACPD, the LACFD, and the State Medical System
- A 400-megahertz trunked radio system that includes a link with the LACFD
- Transmission and reception (through the EOC) for:
    - Secure telephone
    - Secure fax
    - Secure still video
    - Secure videoconference system (to all DOE EOCs and DOE Headquarters)

- Access to all radio systems outlined above (through the EOC).

Off-site communications with federal, state, tribal, county, and other agencies are available through the following:

- A Centrex telephone system
- Private telephone lines (if Centrex fails)
- Two NAWAS stations
- A link to KRSN radio (local radio station)
- The local cable television
- The Community Alert Network

The LANL EOC, maintained by EM&R personnel, operates radio systems on key LANL and off-site channels. Emergency personnel responding to on-site incidents have the benefit of wide-area radio coverage using EOC facilities. The Duty Emergency Manager is responsible for activating whatever support personnel, equipment, or services are needed 24 hours a day.

E.3 CONTINGENCY PLAN IMPLEMENTATION [20.4.1 NMAC § 264.56]

The following sections discuss guidelines used to implement this plan, emergency notification, emergency manager actions, and actions to be taken in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents into the environment at LANL.

E.3.1 Guidelines for Implementation [20.4.1 NMAC §§ 264.51(b) and 264.56]

The decision to implement this plan depends upon whether an emergency exists, which for the purposes of this section is defined as an imminent or actual incident arising from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents that could threaten human health or the environment. The Duty Emergency Manager or IC will use the guidelines listed below to decide whether to implement this plan. All adverse environmental, safety, health, and operational occurrences (on-site and off-site) will be investigated to determine the causal factors and identify the appropriate corrective actions.

This plan will be implemented immediately in the following situations involving releases or potential releases of hazardous or mixed waste:

- Spills:

  - If a hazardous or mixed waste spill cannot be contained with secondary containment or application of sorbents
  - If a hazardous or mixed waste spill causes the release of flammable material, creating a fire or explosion hazard
  - If a hazardous or mixed waste spill results in toxic fumes that threaten human health
- Explosions:
  - If an unplanned explosion involving hazardous or mixed waste occurs
  - If an imminent danger of an explosion involving hazardous or mixed waste exists.
- Fires:
  - If a fire involving hazardous or mixed waste occurs
  - If any building, grass, forest, or nonhazardous waste fire exists that threatens to volatilize or ignite hazardous or mixed waste.
- Other Acts of Force Majeure (i.e., acts of God)
  - If an earthquake or other natural disaster threatens containment integrity, including precipitation that threatens to move spilled material off site.

E.3.2 Emergency Notification [20.4.1 NMAC § 264.56(a) and (b)]

Emergency notification requires immediate notification of 911 or EM&R personnel upon discovery of an imminent or actual incident involving hazardous and/or mixed waste. During nonworking hours, personnel will report all imminent or actual incidents involving hazardous and/or mixed waste to the Emergency Manager or the CAS operator at 667-6211. In the case of fire, notification of these individuals is superseded by the LANL fire alarm system. A fire is reported by dialing 911 (from telephone exchanges 667 and 665) or 667-7080 (from all exchanges, including cellular phones), activating automatic alarms, or activating a fire alarm pull box. All fire alarms alert the CAS operator, the LACFD, and PTLA, who in turn notify the Duty Emergency Manager.

Upon recognition of a hazardous or mixed waste emergency, the first arriving emergency-trained person will become the Facility Command Leader. Once EM&R personnel is notified of the emergency, the Duty Emergency Manager will proceed to the scene and be briefed by the Facility Command Leader, building/area personnel, and/or other emergency units/teams. The Emergency Manager will then assume the position of IC. If necessary, the IC may recommend that the EOC be activated and that the necessary members of the emergency management team be determined. The IC will form an ICS and contact the HAZMAT Supervisor. The HAZMAT Supervisor will notify the appropriate emergency response groups. The IC may determine from the list of response groups described in Table E-1 which groups to contact in an emergency. Each response group maintains an on-call person and/or a call-down procedure to respond to emergencies.

EM&R personnel will be notified of any potential hazardous or mixed waste emergency. The IC and the HAZMAT Supervisor will use whatever means are available (including the assistance of other response groups, computer data searches, and sampling) to determine if a hazardous or mixed waste emergency exists.

E.3.3 Emergency Manager Actions [20.4.1 NMAC § 264.56(b-h)]

Upon notification of an emergency incident, the Duty Emergency Manager may:

- Make an initial assessment of the incident and, in conjunction with the IC, obtain resources to determine the source, quantities, and types of hazardous and/or mixed waste involved and the areal extent of any released materials.
- Request resources needed and have EOC staff begin notifications.
- Proceed directly to the scene.
- Assess the nature of the incident (e.g., through communication with the IC).
- Assume incident command after a direct briefing with the Facility Command Leader.
- Based on the guidelines in Section E.3.1 of this plan, determine if implementation of this plan is warranted.
- Activate the EOC, if necessary.

Upon deciding to implement this plan, the IC will, when appropriate:

- Assess the hazards to human health and the environment, including both direct and indirect effects, such as generation of toxic, irritating, or asphyxiating gases and/or hazards of runoff of water or chemicals used for fire suppression. An individual designated by the IC will use the guidelines in Section E.3.1 to assess the hazards to human health and the environment. If any of the criteria under Section E.3.1 are met and if the responsible Group Leader (or his/her designee) has not already accomplished evacuation of the area, the IC will initiate shelter in place or evacuation of the immediate area.

- Direct the EOC staff to initiate protective actions and immediately notify appropriate response groups and personnel as per the EM&R Guidelines. The IC may activate one or more of the following community alert mechanisms: the Community Alert (telephone) Network, the KRSN radio remote input system, or the cable television capture system, sitewide area network radios, and public radio and television channels.

- In the case of fire or release of any type, make reasonable efforts to confirm that all response personnel at the scene are aware of actual or imminent special hazards associated with hazardous or mixed waste.

- In emergency situations, contact the appropriate ENV representative to notify the New Mexico Environment Department (NMED) at (505) 827-9329 and the National Response Center at (800) 424-8802, reporting:

    - The name and telephone number of the ENV representative
    - The name and address of the facility
    - The time and type of incident
    - The name and quantity of material involved, to the extent known
    - The extent of injuries, if any
    - The possible hazards to human health or the environment outside the facility.

- When an emergency occurs at hazardous or mixed waste treatment units, ensure that appropriate LANL personnel monitor for leaks, pressure buildup, gas generation, or equipment ruptures.

Once control of the emergency is established, the IC will take all reasonable measures to minimize the occurrence, recurrence, or spread of fires, explosions, or releases. In addition, the IC will delegate cleanup and decontamination responsibilities to the Recovery Manager. These responsibilities may include:

- Arranging for site cleanup.
- Assisting with arrangements for proper handling of recovered waste, contaminated soil, or contaminated surface/groundwater.
- Assisting with arrangements for decontamination of equipment, as needed.
- Arranging for replacement and/or repair of equipment, as needed.
- Requesting that testing is conducted to verify successful cleanup.

Within 15 days of the incident, DOE National Nuclear Security Administration (NNSA) Los Alamos Site Office (LASO) will submit a report to the Secretary of the NMED. The contents of this report are generated by several LANL groups responding to the emergency, as detailed in Section E.11.

E.4 SPILLS [20.4.1 NMAC § 264.56(e)]

Sudden releases may include spills of hazardous or mixed waste that pose a significant threat to human health or the environment. Spill incidents resulting in a sudden release of hazardous or mixed waste that present a potential threat to human health or the environment, as listed in Section E.3.1, require implementation of this plan.

Hazardous and mixed wastes are stored on site at LANL in a variety of containers. Volumes of hazardous or mixed waste managed will vary from unit to unit. The general steps in handling hazardous and/or mixed waste spills are as follows:

- Isolate the immediate area and deny entry to all unauthorized personnel.
- Contain the spill by spreading sorbents or forming temporary dikes to prevent further migration (performed by properly trained personnel, if safe).
- Monitor the spill area and sample the spilled waste and contaminated media.
- Package the waste and contaminated media in sound containers.
- Decontaminate the area and all involved equipment and personnel (followed by testing to assure adequate cleanup).

- Remove the waste and contaminated media (performed by appropriate waste management personnel).

The IC will determine the steps to be taken for spill mitigation. If initial mitigation of the spill is necessary and can be accomplished safely (by appropriately trained personnel) before the Emergency Manager arrives, a qualified member of the affected area's operating group will serve as the Facility Command Leader.

Hazardous and/or mixed waste spills will be stabilized, if necessary, and cleaned up. During spill control and cleanup, all personnel will wear appropriate personal protective equipment (PPE). Monitoring will be conducted to ensure that chemical and, as appropriate, radiological exposure is minimized. The collected material may be treated as hazardous or mixed waste, depending on the components present. Runoff from spills of listed hazardous or mixed waste that have migrated outside hazardous waste management areas must be contained and managed as hazardous or mixed waste, as appropriate. If the spill was from a characteristic hazardous or mixed waste and if it is determined that the runoff does not exhibit the characteristic (i.e., ignitability, corrosivity, reactivity, and/or toxicity), the runoff need not be managed as characteristic waste. Temporary dikes may be constructed to contain runoff.

E.4.1 Spill Control Procedures

When a flammable organic solvent spill, a highly acidic spill, or a highly caustic spill has been stabilized with the contents of an organic solvent spill kit, an acid spill kit, or a caustic spill kit, respectively, the resulting material may be sorbed using a nonbiodegradable sorbent. Nonbiodegradable sorbent can be used to control any spill if it is known to be compatible with the spilled material. Appropriate containers or packaging will be used to collect all spilled material and contaminated sorbent. Table E-3 lists emergency equipment that will be made available for spill control at the unit proposed at the TRUWF. The ultimate disposition of any contaminated sorbent or waste material will be determined by appropriate waste management personnel, according to hazardous waste management regulatory requirements.

E.4.2 Decontamination Verification

Decontamination will be accomplished at the spill site. After the spilled material has been sorbed, the material will be containerized. If the spill occurs on a concrete or asphaltic-concrete area, water or an appropriate solvent will be used to clean the area. Liquids (i.e., spilled material and cleaning water or solvents used to clean a spill) may be sorbed with a compatible, nonbiodegradable sorbent and containerized. If a spill is from an identifiable source, the spilled material may be characterized as a newly-generated waste using acceptable knowledge or may be analyzed, as applicable, for the hazardous waste constituents known to be components of the waste managed at that unit. Analytical method(s) given in Table E-4 will be utilized, as appropriate. If the spill is from other than an identifiable source, the spilled material will be analyzed for the appropriate parameters listed in Table E-4. All personnel conducting decontamination verification will wear appropriate PPE. Radiation protection personnel will conduct health physics monitoring whenever mixed waste is involved to ensure that radiation exposure is maintained as low as reasonably achievable. Any hazardous or mixed waste collected from decontamination activities will be handled appropriately.

In order to establish baseline data, a sample of decontamination water or solvent (and nonbiodegradable sorbent material, as applicable) will be taken prior to the start of the decontamination effort. A sample of the final wash water (or the used sorbent) will then be taken. The baseline samples and final wash water/used sorbent samples will be analyzed for the applicable parameters given in Table E-4. If the decontamination samples contain hazardous constituents that are not present in the baseline samples and the levels exceed established health-based levels, the decontamination procedure may be repeated. An alternative demonstration of decontamination may be proposed and justified to NMED, who will evaluate the proposed alternative in accordance with the standards and guidance currently in effect. If the proposed alternative is accepted, decontamination levels will meet the levels approved by NMED. Each sample will be collected with an appropriate sampling device (e.g., a thief or trier) as specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), and approved updates, as applicable.

If a hazardous/mixed waste spill occurs on soil, any free liquid present will be collected and containerized. Liquids may be sorbed with a compatible nonbiodegradable sorbent prior to containerization. For such a spill, contaminated soil will either be excavated and containerized or remediated in situ. Industrial health and safety personnel will conduct industrial hygiene monitoring and, if mixed waste is involved, radiation protection personnel will conduct health physics monitoring, if deemed necessary, to minimize exposure during soil removal or remediation operations. To establish comparative background data, one or more samples will be collected from an unaffected area near the spill site. The spill site will then be characterized, and the data will be compared to the background data to ensure that contaminated material from the spill has been removed or remediated.

If a hazardous/mixed waste spill occurs in an area with flooring, the floor will either be removed in lieu of decontamination, or the floor will be decontaminated. If the decision is made to decontaminate the floor, swipe samples or other types of sampling appropriate for the contaminant will be collected at random and characterized for decontamination verification. If, after several decontamination efforts, it is subsequently determined that the affected floor area cannot be decontaminated, the floor material will be removed. In all cases, wastes generated during the decontamination and/or removal process will be managed appropriately.

E.5 EXPLOSION

Explosions and resultant releases may result in a significant threat to human health or the environment. The potential exists for hazardous or mixed waste to be released during an explosion. Implementation of this plan is required whenever a sudden release that cannot be contained or that presents a threat to human health or the environment occurs as a result of an explosion.

In the event of an explosion at LANL, all personnel will immediately evacuate the area. Any injured personnel will be decontaminated at the site, if required and if time allows. An LACFD ambulance will transport these personnel to LAMC for treatment. If an injury is severe and requires immediate medical evacuation, the injured person will be wrapped to contain contamination, if necessary. In the case of an actual or potential explosion, on-site personnel will contact EM&R personnel immediately so that the Emergency Manager can ensure that all necessary emergency response personnel are alerted. The LACFD is notified automatically upon central alarm system activation. The Emergency Manager assumes incident command and will remain near but at a safe distance from the site in order to inform personnel responding to the explosion of the known hazards.

If a fire results from an explosion, the LACFD Senior Officer will, upon arrival at the scene, evaluate all available information and determine the appropriate firefighting methods and tactics. The LACFD Senior Officer will direct firefighting operations as the acting IC until EM&R formally assumes command.

E.6 FIRE

Fires and resultant releases of hazardous or mixed waste may result in a significant threat to human health or the environment. Implementation of this plan is required whenever a fire incident results in a sudden release of hazardous or mixed waste that cannot be contained or that presents a threat to human health or the environment.

Fire alarms will be sounded automatically or manually to alert personnel that a fire hazard exists and to evacuate the area immediately if in the vicinity. Information related to the various fire alarms at the specific unit is included in Table E-3.

Depending on the size of the fire and the fuel source, portable fire extinguishers may be used. However, LANL policy does not encourage the use of portable fire extinguishers by employees unless they are properly trained. Instead, LANL policy encourages immediate evacuation of the area and notification of the CAS operator by dialing 911. For any fire, including a fire that involves hazardous or mixed waste, the responsible Group Leader and EM&R personnel must be contacted immediately. The Emergency Manager will alert the LACFD and all other necessary emergency response personnel. If the fire spreads or increases in intensity, all personnel must follow protective actions as designated by the Emergency Manager. The Emergency Manager assumes incident command and will remain near the scene to advise personnel responding to the fire of the known hazards.

Upon arrival at the scene, the LACFD Senior Officer will evaluate all available information and determine the appropriate firefighting methods and tactics. The LACFD Senior Officer will direct firefighting operations as the acting IC until EM&R formally assumes command.

E.7 UNPLANNED NONSUDDEN RELEASES

Nonsudden releases include those incidents that, if uncontrolled, impact the environment over a long period of time. Such incidents include minor leaks from containers and loss of secondary containment integrity.

E.7.1 Responsibility

Appropriate LANL personnel are responsible for correction of a nonsudden release from a hazardous or mixed waste unit if the correction can be performed safely with normal maintenance and management procedures. Personnel from EM&R may provide assistance in mitigating releases. Any correction methods for nonsudden releases that have resulted in an impact to the environment will be coordinated with the NMED.

E.7.2 Nonsudden Releases

In general, the response to a nonsudden release will be to contain the release, to correct the cause of the release, and to clean up any release to a level that protects human health and the environment.

Appropriate LANL personnel will conduct regularly scheduled inspections to detect failure of containment at the proposed container storage/treatment unit addressed in this permit modification request package. Secondary containment systems will be inspected regularly to ensure that the integrity of the containment systems has not deteriorated. If an inspection reveals that containers are leaking or that secondary containment has deteriorated, LANL personnel will ensure that maintenance or replacement of containment is performed, as appropriate. Inspections will be conducted in accordance with the facility's inspection plan.

E.7.3 Nonsudden Release Surveillance

In addition to routine inspection and site-specific sampling and testing, LANL has established an area-wide environmental monitoring network maintained by ENV. Monitoring and sampling locations for various types of measurements are organized into three main groups. Regional monitoring stations located within the five counties surrounding Los Alamos County are placed up to 80 kilometers (50 miles) from LANL. These stations serve to determine background conditions. Perimeter stations, located within approximately 4 kilometers (2.5 miles) of the LANL boundary, document conditions in residential areas surrounding LANL. On-site stations, most of which are accessible only to employees during normal working hours, are within the LANL boundary.

Routine surveillance conducted at these stations includes measuring radiation and collecting samples of air particulates, surface waters, groundwater, soil, sediment, and foodstuffs for subsequent analysis. Additional samples provide information about particular events, such as major runoff events and nonroutine releases. Data from these efforts are used for comparison with standards, for determining background levels, and for radiation dose calculations.

E.8 EXPOSURE TO HAZARDOUS OR MIXED WASTE

If a person is exposed to hazardous or mixed waste, the affected person, a co-worker, or line management will notify EM&R personnel. Appropriate first aid should be administered immediately. An EM&R representative will make appropriate notifications as soon as possible so that exposure levels and decontamination requirements can be established. The affected person will then be transported to the occupational medical facility or to LAMC for evaluation. If possible, the material involved in the exposure will be ascertained, and the information will be given to the medical staff.

Other potential exposures will necessitate evacuation of the area, if appropriate, or under any of the following conditions:

- Irritation of the eyes, breathing passages, or skin
- Difficulty in breathing
- Nausea, lightheadedness, vertigo, or blurred vision.

The affected person will be transferred to the occupational medical facility or to LAMC. An industrial health and safety, radiation protection, or HAZMAT representative will attempt to ascertain what, if any, exposure occurred and what corrective measure is appropriate.

E.9 EVACUATION [20.4.1 NMAC § 264.52(f)]

A facility will be evacuated upon the voice command to evacuate the area or upon the sounding of the evacuation or fire alarm. The IC may call for sheltering in place when evacuation is impractical due to significant airborne hazards. Shelter in place may be possible in a designated area or in a building where all exterior windows and doors may be closed and outdoor air ventilation equipment turned off. Once the airborne hazard has decreased, personnel would then be evacuated.

E.9.1 Emergency Process Shutdown Prior To Evacuation

Personnel are instructed to shut down equipment prior to evacuating a building/area unless an immediate building/area evacuation is announced or signaled. To ensure efficient shutdown, training and exercises addressing the shutdown process are performed. In the case of an immediate evacuation, a selected team may shut down designated equipment in an evacuated area. The team will be equipped with proper equipment and PPE. If they are on location, industrial hygiene and safety, radiation protection, and/or HAZMAT personnel will provide advice and assistance. Process-shutdown procedures apply mainly to hazardous or mixed waste treatment units and are addressed, as appropriate, in Attachment E of TA-specific permit applications, permit modification requests, or permit renewal applications.

E.9.2 Evacuation Plan

Emergency situations may warrant the shutdown and evacuation of areas or buildings in order to protect personnel and property, to anticipate the emergency condition, or to enhance the appropriate response. Table E-5 lists the criteria for evacuation, persons responsible for initiating evacuations, and reentry conditions. Figure E-3 shows evacuation routes and assembly/muster areas for the proposed container storage/treatment unit at the TRUWF facility.

To initiate the evacuation of a building/area, the evacuation or fire alarm is sounded and/or the public address (PA) system may be used. Evacuation alarms cannot be silenced and reset by site personnel. Only the Fire Alarm Maintenance Section and the LACFD Battalion Chief can silence and reset alarms. To evacuate a portion of a building or area, use of the PA system may be more appropriate. The PA system will notify the occupants of the area to be evacuated and will advise personnel throughout the building of the existence of a problem in a specific area. Once evacuation has been initiated and if conditions allow, personnel will turn off all equipment that could contribute to the hazard if left unattended. All personnel will then proceed from the affected area to the assembly/muster area.

In the event of evacuation of a building, an outbuilding, or an outlying work area, the responsible Group Leader (or his/her designee) will determine a control point at the closest safe location (e.g., considering wind direction). The designated area will be outside the affected area and will serve as an assembly/muster area where the Group Leader (or designee) can oversee evacuation operations and work to prevent further spread of the hazard.

As personnel exit an affected building/area, a primary sweep of the building/area will be performed to ensure that all personnel have evacuated. If the building/area is evacuated, a Group Leader designee will take attendance at the assembly/muster area and report personnel accountability to the IC. The evacuation procedure is as follows:

- The person discovering the accident or emergency will call 911 to ensure that line management and EM&R personnel are notified.

- Site-specific BEPs and/or emergency action procedures will be followed concerning evacuation, sweep, personnel accountability, and equipment shutdown procedures.

A responsible on-site person may direct the initial evacuation and the central alarm system may be activated. EM&R personnel will be notified immediately and will dispatch the Duty Emergency Manager. A responsible on-site person may implement the evacuation process until the Duty Emergency Manager arrives at the scene to assume that responsibility.

E.10 SALVAGE AND CLEANUP [20.4.1 NMAC § 264.56(g) AND (h)]

Appropriate representatives from the ENV groups will survey the affected area before salvage and cleanup begin. They will conduct visual inspections and sampling, as appropriate, of the affected area to determine whether cleanup is complete. If gases or fumes, electrical or radiological problems, or other conditions present a hazardous situation, personnel or selected teams equipped with proper PPE will reenter the area to perform designated decontamination tasks, repairs, and salvage to allow the return to normal operations. After an emergency, the IC will turn the operation over to a designated Recovery Manager, who will:

- Provide for proper handling of recovered waste, contaminated soil or surface water, or any other material that results from a spill, fire, or explosion. Contaminated material will be managed appropriately and temporarily stored at one of the hazardous or mixed waste storage areas at LANL. Waste management personnel will be responsible for determining the final disposition of the waste. This determination will be made in compliance with hazardous waste management regulations.

- Arrange to monitor for damage or improper operation of the unit and associated equipment as a result of the emergency or of plant shutdown in response to the emergency.

- Arrange for site cleanup procedures to be completed and ensure that no waste that may be incompatible with the released material is treated or stored in the same area.

- Ensure that emergency equipment is cleaned, decontaminated, and fit for its intended use before operations are resumed. Equipment will be inspected visually and then sampled, if necessary, to determine the type and degree of contamination and to determine appropriate cleanup measures.

Prior to resuming operations, the appropriate facility management at LANL will verify that the previously mentioned tasks have been performed. The owner/operator (DOE NNSA/LASO) will notify appropriate state and local authorities that cleanup procedures are completed and that emergency equipment is clean and fit for its intended use.

The IC assumes the coordination of post-emergency actions (particularly during the time period immediately following the emergency) until a Recovery Manager is appointed. The Recovery Manager then assumes this coordination role. The Recovery Manager is the functional equivalent of the Emergency Coordinator for post-emergency actions. The post-emergency actions include cleanup operations, vital equipment repair, or interim hazard-removal operations (such as arranging for demolition of unstable walls). The services of affected operational organizations, ENV groups, KSL, and other on-site resources will also be used to estimate cleanup costs and operational impact.

E.11 EMERGENCY RESPONSE RECORDS AND REPORTS [20.4.1 NMAC § 264.56(j)]

Any emergency that requires implementation of this plan will be documented by the Group Leader (or his/her designee) responsible for the hazardous or mixed waste unit associated with the emergency, and reported in writing within 15 days of the incident to the NMED. The incident report, submitted by DOE NNSA/LASO, will include the following data:

- Name, address, and phone number of owner or operator
- Name, address, and phone number of the facility
- Date, time, and type of incident (e.g. fire, explosion, spill)
- Name of material(s) involved
- Quantity of material(s) involved
- Extent of injuries (if any)
- Assessment of actual or potential hazards to human health or the environment
- Estimated quantity and disposition of material recovered from the incident.

In addition, LANL personnel responding to any emergency requiring implementation of this plan will record the date, time, location, and details of the incident. This information will be maintained in the facility operating record.

E.12 CONTINGENCY PLAN AMENDMENT [20.4.1 NMAC § 264.54]

This plan will be reviewed periodically by appropriate division personnel. The plan will be amended immediately if determined to be inadequate to handle releases (spills, explosions, and/or fires) and whenever:

- The facility permit is revised.

- There is change in the design or operation of the facility (e.g., quantities of waste handled and handling techniques) that increases the likelihood of an emergency and requires changes in emergency response.

- The Primary Emergency Manager changes.

- The list of emergency equipment changes significantly.

E.13 REFERENCES

EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA-SW-846, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

LANL, 2002, "Los Alamos National Laboratory Emergency Management Plan," LIR 403-00-01.0, Los Alamos National Laboratory, Emergency Management and Response Office, Los Alamos, New Mexico.

Table E-1

Response Groups and Agencies Available to the Emergency Management and Response Office for Guidance and/or Emergency Assistance

LANL[a]-Controlled Response Group	Telephone	Responsibilities
Radiation Protection Personnel	665-7797	Provides routine guidance on radiological decontamination. Provides routine site evaluation and monitoring to determine the nature and extent of contamination (radiological).
Occupational Medicine Personnel	667-0660	Provides emergency medical treatment.
Industrial Hygiene and Safety Personnel	667-5231	Provides guidance on industrial hygiene equipment and operational safety. Provides routine site evaluation/support field testing to determine the nature and extent of contamination (chemical).
Hazardous Materials Team	665-5237	Provides emergency site evaluation/field monitoring (chemical and radiological). Specifies protective clothing and equipment. Dispatches Hazardous Materials Response Team. Provides support for chemical, radiological, hazardous, and mixed waste incidents and decontamination of responders and response equipment.
Meteorology & Air Quality Personnel	665-8855	Provides information on meteorological conditions.
Water Quality and Hydrology Personnel	667-0666 or 665-0453	Provides information on hydrologic conditions.
Hazardous Waste Compliance Personnel	667-0666 or 665-0453	Provides guidance on regulatory requirements. Provide guidance on proper treatment, storage, and off-site shipment of hazardous and mixed waste. Conducts field surveys to determine spread of contamination and adequacy of cleanup.
Ecology Personnel	665-8855	Provides information on biotic conditions.
PTLA, Protection Technology Los Alamos	667-4531	Provides traffic control and security.
KSL[b]	667-2300	Dispatches maintenance personnel and equipment. Assists in waste cleanup under the direction of the Recovery Manager.
Los Alamos County Fire Department	911 662-8301	Dispatches firefighting personnel and equipment and provides Emergency Medical Services.
Los Alamos County Police Department	662-8222	Provides traffic control on public access roads.
Los Alamos Medical Center[c]	662-4201	Provides medical services. Provides and maintains Emergency Room.

[a] Los Alamos National Laboratory.
[b] KBR-Shaw-LATA.
[c] Medical services related to hazardous waste injuries are provided under the direction of Occupational Medicine Personnel.

Table E-2
Los Alamos National Laboratory-Wide Emergency Equipment

Hazardous Materials (HAZMAT) Vehicles and Associated Emergency Equipment:

HAZMAT vehicles and trailers are located at Technical Area (TA) 64, Building 39 (TA-64-39). They are available to the Hazardous Materials Response Team for emergency response to all of the TAs at Los Alamos National Laboratory (LANL). HAZMAT is responsible for maintaining the supplies of appropriate emergency equipment in each vehicle and trailer.

The HAZMAT vehicles and trailers are equipped with safety and emergency equipment, personal protective clothing, and other supplies, which may include, but are not limited to, some or all of the following:

Assorted personal protective equipment, T-shirts, and gloves
Safety goggles, safety glasses, and face shields
Boots and booties
Totally encapsulating suits and boots
Level A and B suits
Flash suits
Self-contained breathing apparatus (SCBA) and SCBA bottles
Respirators and cartridges
Hazardous chemical reference books and other reference materials
Shovels
Siphon pumps
Assorted spill kits and sorbents
Neutralizing solutions: acids, bases, and caustics
Two-way radios, cellular phones, facsimile, and other communication equipment
Bottles of leak detector and leak repair kits
Emergency repair packs
HAZMAT bags
Gas detectors and chemical monitoring equipment
Radiological monitoring equipment
Sponges and cleaners
Warning signs and barricade tape
Traffic control barriers
Flashlights
Cameras and film
Knives
Portable power supplies
Warning and signal horns
Harnesses and belts
Decontamination equipment
Sampling equipment
Lifting equipment and vetter bags
Assorted tools, tape, and other supplies
Non-sparking tools
Biological detection equipment
Chemical vacuums
Sandia foam
Plugging and diking equipment
Sample van equipped with a glovebox and analysis equipment

Table E-2 (Continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Supplemental emergency equipment and personnel available from the Los Alamos County Fire Department (LACFD):

Supplemental emergency equipment available from the LACFD may include, but is not limited to, some or all of the following:

Fire engines
Mini-tankers with compressed air foam capability
Modular ambulances
Rescue vehicles
Crash-Fire-Rescue (CFR) unit
Water tankers with compressed air foam capability
Incident Command vehicles
SCBA units
SCBA air tanks
Remote air system for confined space rescue
Ladder truck with pump
Personnel with Hazardous Material First Response Operational Level training
Personnel with Basic Emergency Medical Technician training
Personnel with Advanced Life Support training

Table E-2 (Continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Supplemental emergency equipment and personnel available from KBR-Shaw-LATA (KSL):

Supplemental emergency equipment available from KSL may include, but is not limited to, some or all of the following:

TRANSPORTATION EQUIPMENT:

Pickups, 1/2 through 3/4 ton
Trucks, 1 through 3 ton
Vans, panels, and carryalls
Buses

SPECIAL EQUIPMENT:

Graders
Loaders
Snowplows and snow blowers
Bulldozers
Scrapers
Semitrailers
Chain saws
Street flushers
Mobile transceivers
Generators
Handsets (2-way)
Pageboys (1-way)
Welders
Mobile site logistics support equipment/associated heavy equipment
Fully equipped spill response unit
Utilities equipment and emergency utility support
Fuel trucks
Light banks
Dump trucks
Backhoes
Potable water trucks
Cranes
Forklifts

TRAINED PERSONNEL:

Heavy equipment operators
Dispatchers
Mechanics
Power saw operators
Radio and telephone operators
Truck drivers
Rodent/Pest Control personnel
HAZMAT response/cleanup personnel
Welders
Electricians

Table E-2 (Continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Emergency equipment and personnel at the Occupational Medicine Clinic:

At TA-3 (SM-1411) Central Clinic:

Emergency equipment and supplies available from Occupational Medicine Personnel may include, but are not limited to, some or all of the following:

PERSONNEL:

Physicians
Physician's Assistants
Nurses
X-ray Technician
Clinical Laboratory Technicians
Clinical Testing Technicians
Clinical Psychologist
Counselors

SPECIAL EQUIPMENT-PORTABLE:

Multichannel emergency receiver-base station
Two-way radio on the State Med Net, the LANL Emergency Management channel, and the LANL Health-Safety Net
Cardiac monitors and defibrillators
Crash cart emergency equipment with E-tank oxygen (O_2)
Portable physicians' bag with medications
Portable suction unit
Portable stretchers (ambulance, gurney, folding)
Wheelchairs
O_2 tanks
Manual resuscitators
Intravenous (IV) stands
IV solutions
Otoscopes/ophthalmoscopes
Portable sphygmomanometers
Stethoscopes
Anticontamination apparel
Eye irrigation solution
First-aid kits
Extrication and cervical collars, crutches, canes
Suture sets
Protective apparel
Morgan lens irrigation sets
Decontamination equipment (portable)

Table E-2 (Continued)

Los Alamos National Laboratory-Wide Emergency Equipment

Emergency equipment and personnel at the Occupational Medicine Clinic (Continued):

At TA-3 (SM-409) Central Clinic (continued):

SUPPLIES-GENERAL:

Bedding/pillows
Rescue blankets
Burn blankets
Thermal/icing pouches
Multitrauma dressings, surgical and first aid supplies
Disposable ice bags

SPECIAL FACILITIES - NONPORTABLE:

Fully equipped decontamination room at the Occupational Medicine Clinic
Completely equipped emergency room with ambulance entrance
Emergency lighting system
Complete X-ray suite
Protective clothing and wound counters
12-lead electrocardiograph
Fully equipped crash cart with Life Pak defibrillator/external pacer, intubation equipment, emergency medications
Fully equipped decontamination room at Los Alamos Medical Center (LAMC) adjacent to the LAMC emergency room

TRANSPORTATION:

Full ambulance service is available within minutes to the central facility.

COMMUNICATION:

Base station on State Medical Net and Los Alamos County Fire Department trunked radio system.

Table E-3 [a]
Emergency Equipment at
Transuranic Waste Facility (TRUWF), Container Storage/Treatment Unit

FIRE CONTROL EQUIPMENT:

ABC fire extinguishers will be located in the TRUWF (TA-52-190) within the main storage area, the indoor shipping and receiving area, the characterization trailer parking area, and the treatment/repackaging/resizing area.

Description of General Capabilities:
The fire extinguishers will be portable, manually-operated units and can be used by any employee in case of fire.

Fire alarm pull boxes and push button stations will be available in the main storage and staging area, the size reduction, decontamination, and repackaging area, and the receiving and shipping area at the TA-52 TRUWF.

Description of General Capabilities:
Fire alarms can be activated by any employee in the event of fire to notify the Central Alarm Station.

The sprinkler systems will automatically activate in the event of a fire and will be located at the treatment/repackaging/resizing area. The facility will have a wet pipe sprinkler system with an alarm.

Automatic thermal alarms will be located in gloveboxes in the size reduction, decontamination, and repackaging area.

Fire hydrants are located outdoors on the north, south, and west sides of TA-52-190.

Description of General Capabilities:
The fire hydrants will supply water at adequate volume and pressure (i.e., approximately 800 gallons per minute and 90 pounds per square inch) to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart v, 264.32, revised October 1, 2003.

SPILL CONTROL EQUIPMENT:

Any drum found to contain liquid waste will be protected using secondary containment pallets. Spill control stations and/or portable spill kits will be located in the main storage and staging area; the size reduction, decontamination, and repackaging area; and the receiving and shipping area at the TA-52 TRUWF as necessary.

Description of General Capabilities:
Spill kits may include items such as: bags of absorbent, absorbent pads or socks, and an inventory of tools and supplies.

Refer to footnote at end of table.

Table E-3 [a] (continued)
Emergency Equipment at
Transuranic Waste Facility (TRUWF), Container Storage/Treatment Unit

COMMUNICATION EQUIPMENT:

Public address (PA) systems will be used locally to notify personnel of an emergency. Personnel may use building and cellular telephones for communication.

Description of General Capabilities:
PA telephones may be used for internal communication and are available for use by any employee.

Telephones will be available that will be capable of handling incoming/outgoing calls and paging. Two-way radios are available from the Nuclear Materials Technology Facility Incident Command located at TA-52-190, for personnel working in the facility.

Description of General Capabilities:
External telephones may be used to notify LANL support agencies outside of TA-52-190 and are also available for use by any employee.

Alarms at TA-52-190:
The fire alarm will be a zone-wide whooping sound.

If a drop-box pushbutton station is used, a zone-wide, high-pitched constant tone will be activated and then switch to the standard whooping sound.

Description of General Capabilities:
Fire and evacuations alarms will be activated in the event of a fire or in case of an evacuation. When activated, the fire alarm notifies the Central Alarm Station.

The facility will have a Continuous Air Monitoring System (CAMS) to detect and warn workers of the presence of contamination.

DECONTAMINATION EQUIPMENT:

A change room equipped with showers will be available during retrieval, characterization, treatment and drum venting operations. Eyewash stations will also be available onsite during these operations. The facility will have one self–contained hard-piped decontamination shower located in the treatment, decontamination and repackaging area of the building.

Description of General Capabilities:
Safety showers and eyewashes are available for decontamination of personnel who receive a chemical splash to the skin or eyes.

Material Safety Data Sheets (MSDS) will be available in the administrative area at TA-52-190. Specific MSDSs may be obtained prior to working with any hazardous waste to determine if the application of water is indicated for decontamination.

Refer to footnote at end of table.

Table E-3 [a] (continued)
Emergency Equipment at
Transuranic Waste Facility (TRUWF), Container Storage/Treatment Unit

PERSONAL PROTECTIVE EQUIPMENT:

Appropriate personnel protective equipment (specified in a Health and Safety Plan or Integrated Work Document) will be worn during retrieval, characterization, treatment and drum venting operations. Personnel involved in waste handling will be required to wear protective coveralls and steel-toed shoes. Hard hats and gloves will be worn as prescribed in the Health and Safety Plan.

OTHER:

If transportation is needed for evacuation, vehicles may be obtained through the Emergency Management and Response Group.

[a] Equipment types and locations are subject to change.

Table E-4
Waste Analysis Parameters and Test Methods[a]

Parameter	Test Method	Reference[b]
Ignitability	Pensky-Martens closed-cup method Setaflash closed-cup method Ignitability of solids	(L, S) SW1010, SW1020A (S) SW1030 (L, S) ASTM D93-02a
Reactivity	Test method to determine hydrogen cyanide released from waste Test method to determine hydrogen sulfide released from waste	(L, S) SW, Section 7.3
Corrosivity	Electrometric (pH of aqueous solution)	(L) SW9040B
Toxicity characteristic (TC)	Toxicity characteristic leaching procedure (TCLP) extraction	(S) SW1311
TC Metals:	Flame atomic absorption spectroscopy (FLAA), Gas chromatography/mass spectrometry (GC/MS), Cold vapor atomic absorption spectroscopy (CVAA)	
Arsenic		(L, S) SW7060A[c], SW7061A
Barium		(L, S) SW7080A, SW7081[c]
Cadmium		(L, S) SW7130[d], SW7131A[c]
Chromium		(L, S) SW7190[d], SW7191[c]
Lead		(L, S) SW7420[d], SW7421[c]
Selenium		(L, S) SW7740[c], SW7741A
Silver		(L, S) SW7760A[d], SW7761[c]
Mercury	Manual cold-vapor technique	(L) SW7470A, (S) SW7471A[e]
Volatile organics	Gas chromatography (GC)/mass spectrometry (MS) GC/MS capillary column technique	(L, S) SW8260B
Semivolatile organics	GC/MS GC/MS capillary column technique	(L, S) SW8270D[f] (S) SW8275A
Organochlorine pesticides	Thermal extraction/GC/MS	(L, S) SW8081A
Chlorinated herbicides	GC	(L, S) SW8151A
Cyanide, free and total	Distillation and colorimetric ultraviolet	(L, S) SW9010B, SW9012A
Total chromium	Colorimetric method for hexavalent chromium	(L, S) SW7196A
Sulfide	Colorimetric titration	(L, S) SW9030B

Table E-4 (Continued)

Waste Analysis Parameters and Test Methods[a]

Parameter	Test Method	Reference[b]
Total RCRA metals[f,g]	Acid digestion	(L) SW3010A, (S) SW3050B
	Inductively coupled plasma atomic emission spectroscopy	(L, S) SW6010B
Arsenic		(L, S) SW6010B
Barium		(L, S) SW6010B
Cadmium		(L, S) SW6010B
Chromium		(L, S) SW6010B
Lead		(L, S) SW6010B
Selenium		(L, S) SW6010B
Silver		(L, S) SW6010B
Mercury	Manual cold-vapor technique	(L) SW7470A, (S) SW7471A
Free liquids	Paint Filter Liquids Test	(L, S) SW9095A

[a] At Los Alamos National Laboratory, current analytical capabilities include limited analyses of mixed waste samples. These analyses include gross alpha, beta, and gamma screening.

[b] "A" (e.g., A006) refers to U.S. Environmental Protection Agency, 1984, "Sampling and Analysis Methods for Hazardous Waste Combustion," *EPA-600/8-84-002*.
"ASTM" refers to American Society for Testing and Materials standards.
"SW" refers to U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
(L) refers to liquid waste.
(S) refers to solid waste.

[c] Method being integrated into Method 7010, per the May 1998 SW-846 Draft Update IVA

[d] Method being integrated into Method 7000B, per the May 1998 SW-846 Draft Update IVA

[e] Method being integrated into Method 7471B, per the May 1998 SW-846 Draft Update IVA

[f] See also atomic absorption methods. Total metals may be substituted for TCLP metals, if appropriate.

[g] RCRA = Resource Conservation and Recovery Act.

Table E-5

Evacuation Determination and Reentry Conditions

Reason for Evacuation	Evacuation Determination Made by	Reentry Conditions[a]
Fire	[1]Fire or evacuation alarm, Group Leader or alternate, Lead Engineer, Senior Staff Member present, Senior Technician, or Emergency Manager	Following survey by the person designated by the IC[b]
Explosion	Same as 1 above	Same as above
Loss of ventilation	[2]Group Leader or alternate, Senior Staff Member, Lead Engineer, or Senior Technician	Same as above
Loss of electric power	Same as 2 above	Same as above
Extensive contamination	Same as 2 above or a Radiation Protection Representative	Same as above
Airborne contamination	Same as 2 above or Radiation Monitor	Same as above
Escape or release of toxic or hazardous gas or fumes	Group Leader or alternate, Senior Staff Member, Lead Engineer, Senior Technician, or Emergency Manager	Same as above
Bomb or bomb threat	EM&R[c] or PTLA[d] representative, R&D[e] Section Leader or alternate, Senior Staff Member, or Lead Engineer	Same as above

[a] All reentries are authorized by the EM&R Incident Commander.
[b] "IC" refers to the Incident Commander as defined in 29 CFR § 1910.120.
[c] "EM&R" refers to the Emergency Management and Response Personnel.
[d] "PTLA" refers to Protection Technology Los Alamos.
[e] "R&D" refers to the Research and Development Section.

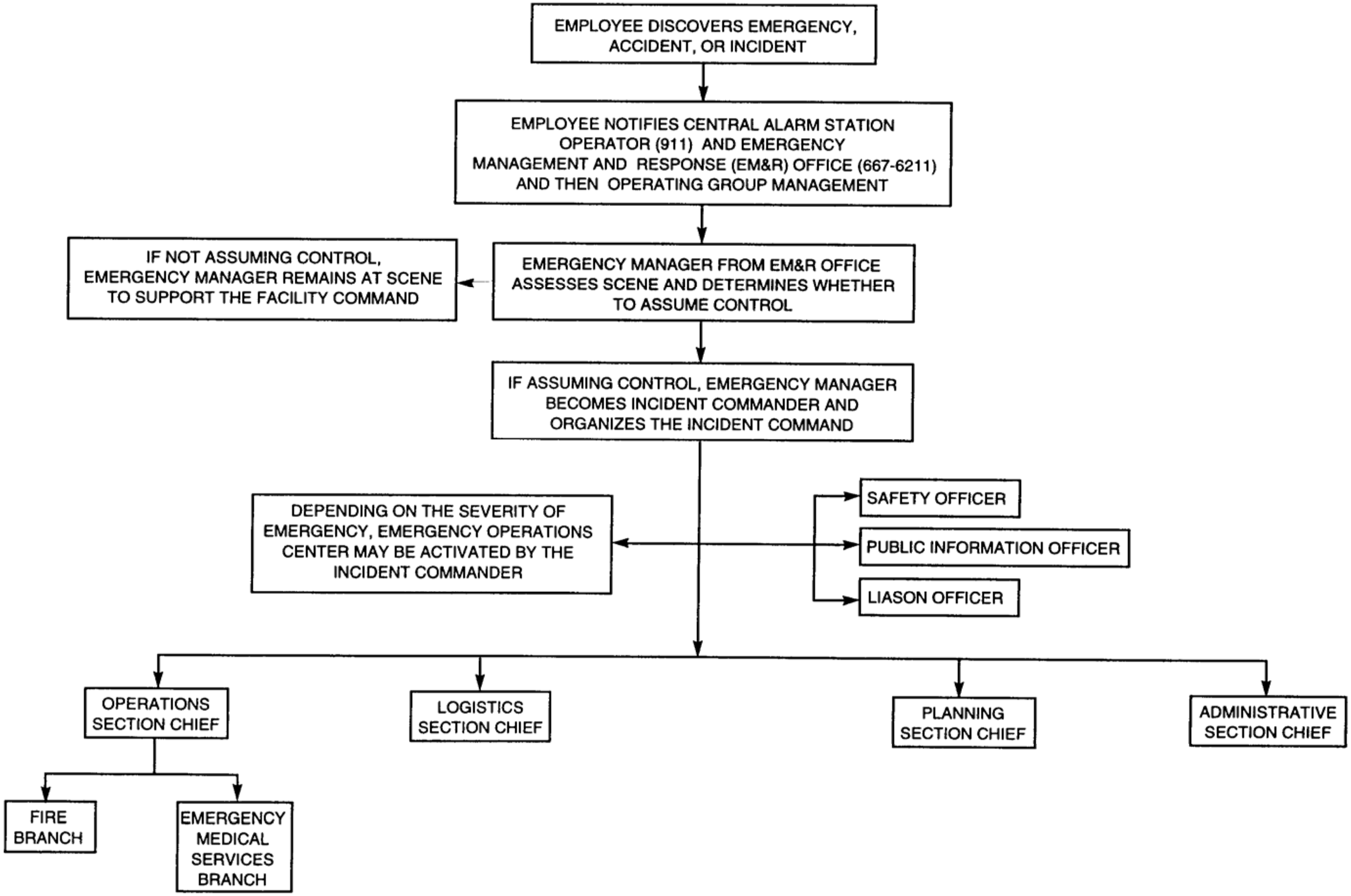

Figure E-1

General Hazardous and Mixed Waste Emergency Notification Structure

Document: TRUWF Permit Modification
Revision No.: 0.0
Date: August 2007

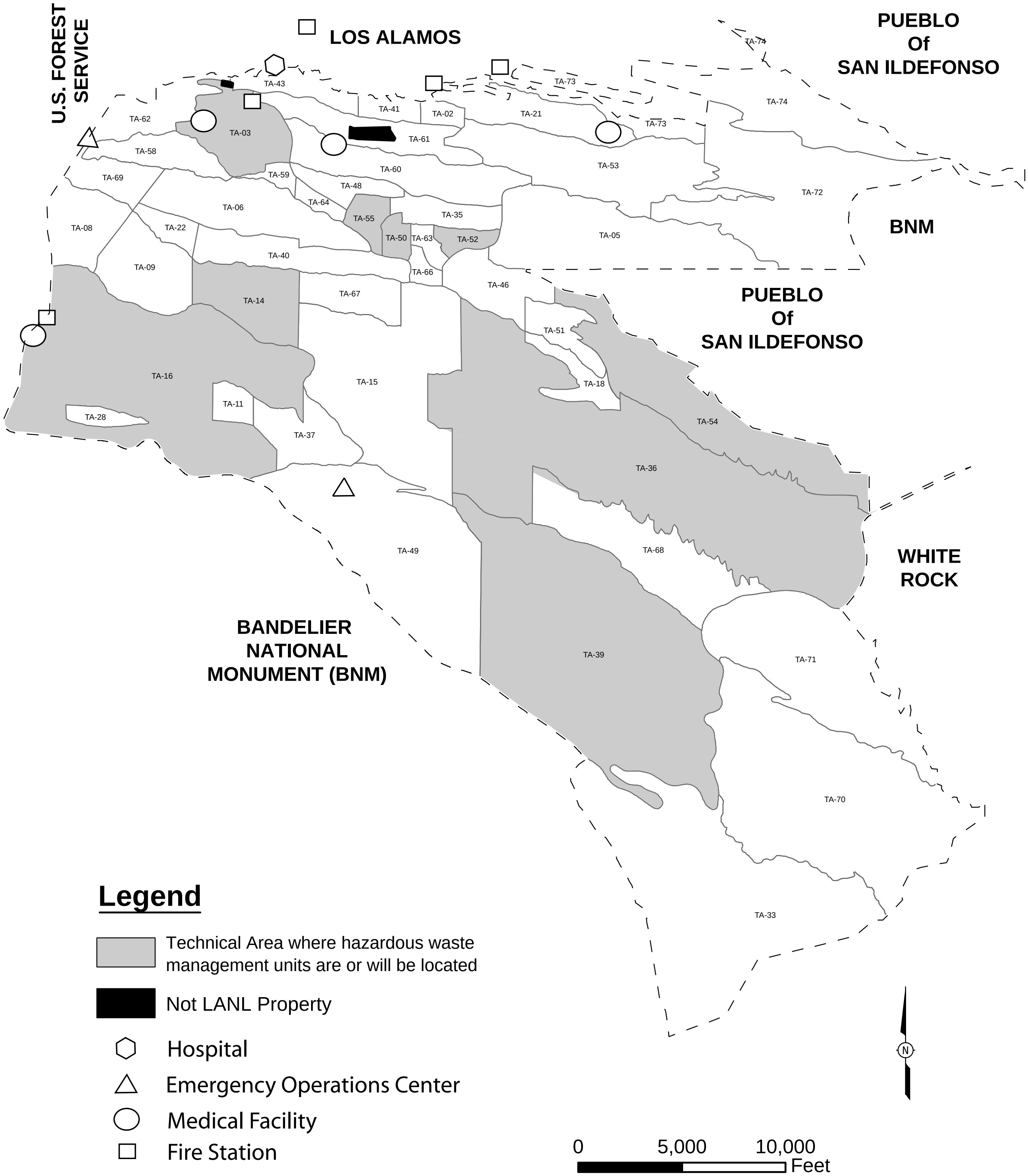

Figure E-2

Emergency Facilities

Created by ERSS GIS TEAM. Map Number 06-0108 September12, 2005
State Plane Coordinate System New Mexico Central Zone North American Datum 1983 (ft)
This map was created for work processes associated with the Environmental &Remediation Support Services. All other uses for this map should be confirmed with LANL EP-ERSS staff.
Boundary of Department of Energy Property I Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; infrastructure Planning Office. 10 February 2006
Boundary of Department of Energy Property In and Around the Los Alamos National Laboratory; Los Alamos National Laboratory, SSMO Site Planning & Project Initiation; 01 February 2003 as captured 07 September 2004.

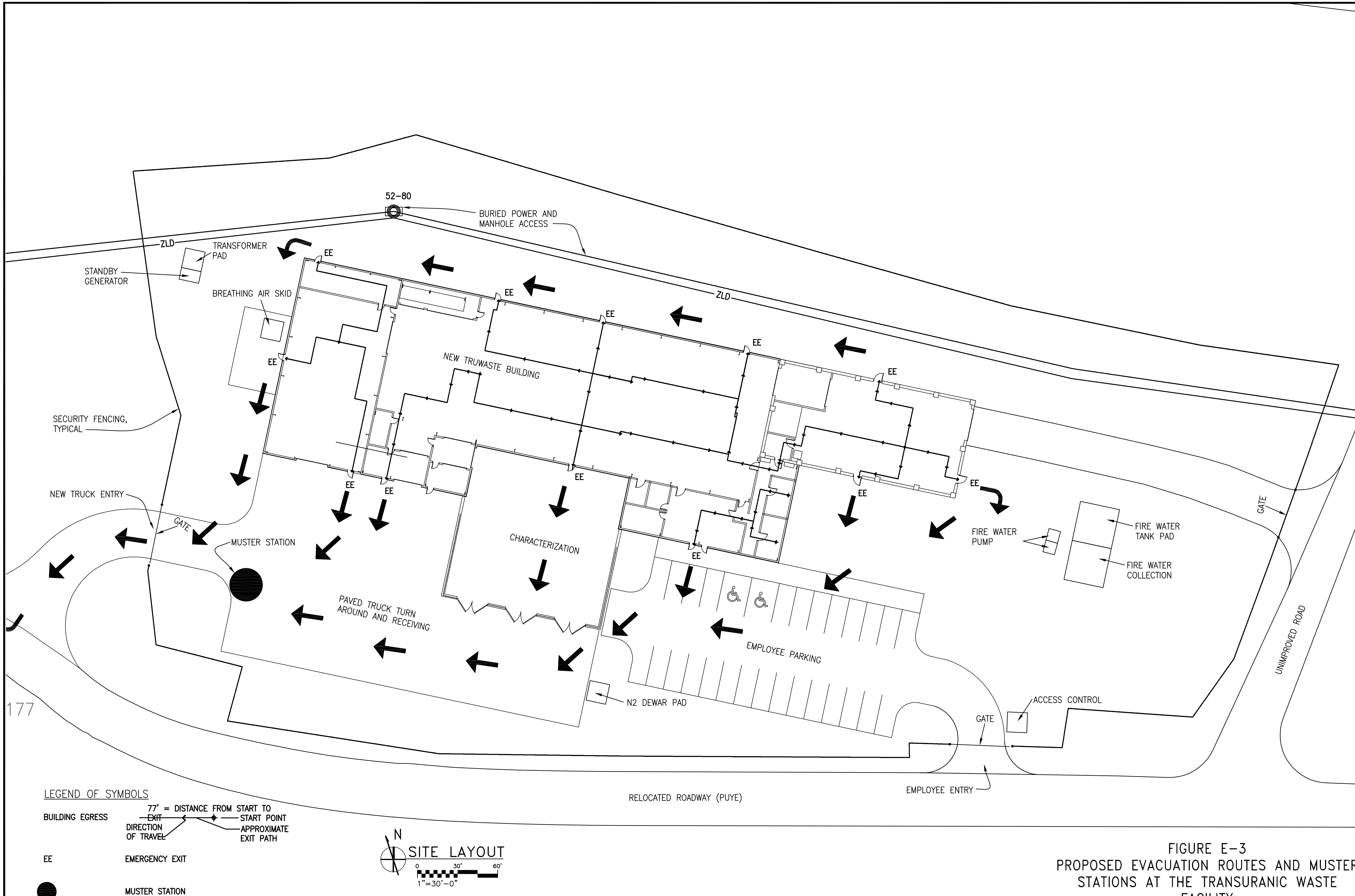

FIGURE E-3
PROPOSED EVACUATION ROUTES AND MUSTER STATIONS AT THE TRANSURANIC WASTE FACILITY

APPENDIX F

CLOSURE PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF SUPPLEMENTS

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CFR	Code of Federal Regulations
COLIWASA	composite liquid sampler
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ESL	Ecological Screening Levels
HWB	Hazardous Waste Bureau
LANL	Los Alamos National Laboratory
NIOSH	National Institute of Occupational Safety and Health
NMED	New Mexico Environment Department
PPE	personal protective equipment
P&T	Packaging and Transportation
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SSL	Soil Screening Levels
SW-846	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
TA	Technical Area
TRUWF	Transuranic Waste Facility

F.1 INTRODUCTION

The information provided in this closure plan is submitted to address the closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart V (20.4.1.500 NMAC), incorporating the Code of Federal Regulations (CFR), Title 40, Part 264, Subparts G, I, J, and X, as revised October 1, 2003 [10-1-03], for waste management units that will be operated at the Los Alamos National Laboratory (LANL) under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act. This closure plan describes the activities necessary to close the hazardous waste storage/treatment unit proposed at the LANL Technical Area 52 Transuranic Waste Facility (TRUWF). General information for the closure activities at the TRUWF storage/treatment unit is presented in this closure plan. Specific information on closure decontamination, sampling strategies, and analytical requirements for indoor portion and the outdoor portion of the container storage/treatment unit at TRUWF is included in Supplements F.1 and F.2.

Until closure is complete and has been certified in accordance with 20.4.1.500 NMAC, §264.115 [10-1-03], a copy of the approved closure plan, any approved revisions, and closure activity documentation associated with the closure will be on file with LANL hazardous waste compliance personnel and at the U.S. Department of Energy (DOE) Los Alamos Site Office.

F.2 GENERAL CLOSURE INFORMATION

F.2.1 Closure Performance Standard

As required by 20.4.1.500 NMAC, §264.111 [10-1-03], the TRUWF storage unit will be closed to meet the following performance standards:

- Minimize the need for further maintenance;
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, or surface waters, or to the atmosphere; and

- Comply with the closure requirements of 20.4.1.500 NMAC, Part 264, Subparts G and I [10-1-03], including but not limited to, the requirements of 20.4.1.500 NMAC, §264.178 [10-01-03].

This will be accomplished by removal of hazardous and mixed (hazardous waste with a radioactive component) waste from the storage/treatment unit; decontamination, if necessary, of the surfaces and equipment that may have come into contact with the wastes; and/or disposal of contaminated structures or equipment. Verification sampling may be performed after the removal of site structures to assess the potential for residual contamination at the closure site if any evidence is found that indicates there may have been a potential release of hazardous constituents from the unit. If sampling indicates contamination, the level of such contamination will be evaluated for further decontamination activities or management of all remaining unit structures as contaminated waste using appropriate LANL waste management procedures. Decontamination activities will ensure the removal of hazardous waste residues from the TRUWF storage/treatment unit to established cleanup levels as agreed upon with the New Mexico Environment Department (NMED) or as outlined in Section F.5.5 of this closure plan.

F.2.2 Partial and Final Closure Activities

This closure plan has been written for partial closure rather than final closure of the entire LANL facility. Partial closure will consist of closing an individual waste management unit, while leaving the other regulated hazardous/mixed waste management unit at LANL in service. Partial closure of each unit (hereinafter referred to simply as “closure”) will be deemed complete when 1) all surfaces and equipment have been decontaminated, or otherwise properly dispositioned, if necessary; 2) closure has been certified by an independent, professional engineer licensed in the State of New Mexico; and 3) closure certification has been submitted to and approved by the NMED. Final closure of the LANL facility will occur when the remaining hazardous/mixed waste management units at LANL are closed. Final closure will consist of assembling documentation on the closure status of each unit, including all previous partial closures as well as land-based units that have been or are being addressed via coordination with corrective action projects. Final closure will be deemed complete when the information has been submitted to the NMED and approved.

F.3 DESCRIPTION OF UNIT TO BE CLOSED

LANL is located in Los Alamos County, an incorporated county, in north-central New Mexico, approximately 60 miles north of Albuquerque and 25 miles northwest of Santa Fe. LANL is divided into TAs. The TRUWF will be located at TA-52 in the north-central portion of LANL on a mesa between a branch of Mortandad Canyon on the north and Pajarito Canyon on the south. The remainder of this describes the proposed waste management unit at the TRUWF to which this closure plan applies.

F.3.1 Transuranic Waste Facility Waste Management Unit

The TRUWF storage/treatment unit is addressed in this closure plan. Information on the hazardous component(s) of the wastes stored at the TRUWF including a figure of the unit showing waste management areas is provided in the "Los Alamos National Laboratory General Part A Permit Application," Revision 5.1 (LANL, 2007) and in Appendices A and G of this permit modification request submittal.

F.3.1.1 TRUWF Container Storage/Treatment Unit

Container storage within buildings at TRUWF will consist of one unit encompassing much of the proposed building as well as the characterization, shipping and receiving area outside the southern portion of the building. The TRUWF is scheduled to begin construction in 2010 and will begin storing and treating hazardous waste upon completion of construction in 2012. The storage/treatment unit will be used to store mostly newly generated MTRUW in solid form. Waste containers with potential liquids and other types of mixed or non-mixed hazardous waste may also be managed at the TRUWF (e.g., MLLW or hazardous waste). Secondary containment will be used to store liquid waste within the unit. The TRUWF may also be used to conduct treatment within waste containers. Treatment that will occur at the TRUWF includes container based absorption of liquids, neutralization, cementation, and puncturing of aerosol cans. Details on these treatment activities are provided in Section 2 and Appendix G of this permit modification request submittal.

F.3.2 Estimate of Maximum Waste in Storage Unit

The estimated volumes for the maximum inventory of wastes managed at any one time and the total waste inventory over the estimated lifespan for the individual storage unit associated with the TRUWF are proposed to be 3,176,250 gallons. The lifetime of this unit is estimated from the year 2012 to the year 2045.

F.3.3 Description of Waste Managed

The TRUWF waste management unit will be used for storage of hazardous, mixed and mixed transuranic waste in both liquid and solid form. Due to the scope of waste management activities at the TRUWF, the wastes will include corrosive liquids, sludge, debris, and chemical wastes with metals and volatile and semi-volatile organic constituents. Specific hazardous waste constituents that will be managed are described by U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers. These are reflected in the "Los Alamos National Laboratory General Part A Permit Application," Revision 5.1 (LANL, 2007) submitted as part of this permit modification request. A detailed description of the waste streams managed at LANL is presented in the Waste Analysis Plan in Appendix B of this permit modification request package. At the time of closure for each hazardous waste management unit at LANL, the history of the unit will be reviewed to determine the specific waste constituents that apply for each of the units.

F.4 CLOSURE SCHEDULE

Closure of the TRUWF storage unit will occur by 2100. This closure plan is intended to address closure requirements for the unit within the authorized timeframe of the current Hazardous Waste Facility Permit.

Written notification will be provided to the NMED 45 days before the start of closure activities for the TRUWF. However, pursuant to 20.4.1.500 NMAC, §264.112(e) [10-1-03], removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure. Closure activities will begin according to the requirements of 20.4.1.500 NMAC, §264.112(d)(2) [10-1-03]. Treatment, removal, or disposal of hazardous wastes will begin in accordance with the approved closure plan, as required by 20.4.1.500 NMAC, §264.113(a) [10-1-03], within 90 days after final receipt of waste at the TRUWF. This timeframe will be met as long as facilities are available for storage, treatment, or disposal of these wastes. In the event that closure activities cannot begin within 90 days, LANL will notify the Secretary of the NMED in accordance with the extension requirements in 20.4.1.500 NMAC, §264.113(a) [10-1-03]. In addition, the demonstrations in 20.4.1.500 NMAC, §264.113(a)(1) and (b)(1) [10-1-03], will be made in accordance with 20.4.1.500 NMAC, §264.113(c) [10-1-03]. Closure activities and reporting requirements will be completed within 180 days of receipt of the final volume of waste at the unit. Closure will be conducted in accordance with the schedule presented in Table F-1. In the event that closure of the TRUWF cannot proceed according to schedule, LANL will notify the Secretary of the NMED in accordance with extension request requirements in 20.4.1.500 NMAC, §264.113(b) [10-1-03].

F.5 GENERAL CLOSURE PROCEDURES

Closure activities at the TRUWF will involve removal of hazardous/mixed wastes; proper management and disposition of hazardous waste residues, contaminated structures, and contaminated equipment associated with the unit and subsequent appropriate disposition; and verification that the closure performance standards have been achieved. The following sections describe the general closure procedures applicable to the TRUWF closure activities.

F.5.1 Security

Due to the nature of proposed operations at the TRUWF, site security at the TRUWF storage/treatment unit will be maintained by the DOE for as long as necessary to prohibit public access. The security fence at TRUWF will be maintained to prevent public access. Details on security and access control at TRUWF are available in Appendix G of this submittal.

F.5.2 Removal of Waste

Prior to initiation of closure activities, all containerized wastes will be removed from the storage unit scheduled for closure. Containers may be removed from each location with forklifts. Small containers may be handled manually or with dollies. Containers will be placed on flatbed trucks, trailers, or other appropriate vehicles for transport. Appropriate shipping papers will accompany the wastes during transport. Containers holding hazardous or mixed wastes will be moved to an approved on-site container storage unit or a permitted off-site treatment, storage, or disposal facility.

At closure, all remaining hazardous/mixed waste and hazardous waste residues will be removed from the TRUWF. Unit structures, liners, bases, and equipment contaminated with hazardous/mixed waste or hazardous waste residues will be decontaminated or removed/dispositioned. All waste material will be controlled, handled, characterized, and dispositioned in accordance with LANL waste management procedures. Table F-2 provides a list of the potential waste materials that may be generated during closure, possible waste type(s), and disposal options.

F.5.3 Preliminary Closure Procedures

F.5.3.1 Safety Precautions

In accordance with LANL safety procedures, job hazards associated with closure activities will be identified, controls developed, and workers briefed before closure activities are conducted. Personnel involved in closure activities will wear personal protective equipment (PPE) specified by LANL industrial hygiene and health physics personnel, and will follow good hygiene practices to protect themselves from exposure to hazardous and/or mixed waste. The level of PPE required will depend upon the physical hazards present and the levels of radiological and/or chemical contamination detected, if any. If surveys conducted by LANL industrial hygiene and health physics personnel indicate no detectable contamination levels, minimum PPE requirements will consist of coveralls, booties, gloves, steel-toed/composite-toed shoes, and safety glasses or face shields. Additional PPE will be required (e.g., hard hats, ear plugs) if other safety issues are identified. Contaminated PPE will be decontaminated or managed in accordance with applicable waste management regulations.

All workers involved in closure activities will be required to have appropriate training as required by site-specific work procedures. Workers who will manage hazardous/mixed waste or waste constituents during closure activities will follow the training requirements in the appropriate LANL RCRA training plan.

F.5.3.2 Pre-closure and Structural Assessment

Before starting closure decontamination and sampling activities, the operating and inspection records for the waste management unit will be reviewed to determine any previous finding(s) or action(s) that may influence closure activities or potential sampling locations. Goals of this review will be to determine the specific hazardous waste constituents of concern; determine potential sampling locations for the storage unit by identifying any spills or chronic conditions in the operating record that would indicate the type and location of released constituents; and differentiate equipment or other materials that will undergo decontamination from those to be recycled or reused, or managed as waste. Tables in Supplements F.1 and F.2 list potential constituents of concern for the TRUWF storage/treatment unit. Paths forward for equipment and surfaces at the unit, locations for potential soil sampling, and locations and types of decontamination verification sampling (if determined to be necessary) will be identified during this assessment. In addition, background samples or data derived from LANL studies developed under the LANL corrective action program or other programs will be reviewed to determine levels or concentration thresholds applicable for the purposes of closure.

Mechanical systems (piping, heating, ventilation, air conditioning, ductwork, and modular panelized system, etc.) will be constructed and installed to the greatest practical extent so that they can be readily treated, disassembled, decontaminated (if required), size reduced, and packaged for disposal.

A minimum of weekly, preventive maintenance inspections will be conducted at the TRUWF while waste is in storage or waste is being treated. If any defects, deterioration, damage, or hazards affecting containment are identified, appropriate remedial actions (including sampling, repairs, maintenance, or replacement) are completed and noted in the inspection record. This information will be reviewed to determine whether these activities have resulted in conditions affecting the closure or determination of sampling needs.

Prior to beginning any decontamination activities at the TRUWF, the base or secondary containment will be inspected for any existing cracks or conditions that indicate a potential for release of contaminants. This inspection will be documented with photographs and drawings, as necessary. If a crack, gap, or stained area is present, the operating record will be reviewed to determine the possible presence or release of contamination. If contamination could be present, a wipe sample or a representative sample of the media (e.g., concrete) will be taken and analyzed, following procedures outlined in Section F.6 and in Supplements F.1 and F.2 of this closure plan, as appropriate, for the potential hazardous constituents identified during the assessment. If contamination is present above baseline/background levels, the surface flaw will be decontaminated to meet, as necessary, the applicable requirements for disposition (e.g., leaving in place, reuse, or disposal). Material may be partially or completely removed until contamination is no longer detected, or it is established that contamination present is not due to storage or treatment activities at the TRUWF.

F.5.4 General Decontamination Procedures

To the extent necessary, all contaminated equipment present at closure, surfaces, and structures will be decontaminated. Discarded materials and equipment that cannot or will not be decontaminated will be managed as waste or otherwise dispositioned in compliance with applicable regulations. Decontamination procedures specific for the storage/treatment unit at the TRUWF are further described in Supplements F.1 and F.2 of this closure plan.

If decontamination is necessary, all sampling during closure and decontamination will be conducted in accordance with quality assurance (QA)/quality control (QC) procedures defined by the latest revision of “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (SW-846) (EPA, 1986). Monitoring for contamination will occur throughout closure activities, as appropriate.

F.5.4.1 Equipment Located at the Transuranic Waste Facility

All portable equipment (if present) located at the TRUWF will be wiped down with a solution of Alconox®, or equivalent cleaner, and water. To minimize the quantity of wash solution used, it will be dispensed from buckets, spray bottles, or other types of containers. Cheesecloth, rags, or other absorbent materials will be used to wipe down the equipment after being immersed in the wash solution or after spraying solution onto the equipment. If necessary, portable berms or other devices (e.g., absorbent socks, plastic sheeting, wading pools, or existing secondary containment) designed to collect excess wash water and provide containment will collect excess wash water during the decontamination process.

F.5.4.2 Decontamination of Surfaces

Contaminated TRUWF surfaces (i.e., floors, walls, structures) will be decontaminated and/or removed and managed in accordance with appropriate waste management regulations. Decontamination of surfaces will consist of pressure washing or washing with mops, cloths, and/or other absorbent materials to remove any hazardous constituents. When mops, cloths, and/or other absorbent materials are used, the materials will be wetted in a wash solution consisting of Alconox®, or an equivalent cleaner, and water. A portable berm or other device (e.g., absorbent socks, plastic sheeting, wading pools, or existing secondary containment) designed to collect and provide containment for excess wash water will be used, as necessary. If any contaminated portion of the waste management unit cannot or will not be decontaminated to acceptable levels as described in Section F.5.5, the contaminated portion will be disposed of in accordance with appropriate waste management regulations. After decontamination of the surfaces, any excess wash water will be transferred to containers for characterization and disposition.

Decontamination of any asphalt or concrete areas may involve the asphalt or concrete being transported to and stored at other hazardous waste management locations to facilitate the closure process. If the asphalt or concrete is totally removed, or a crack that penetrated through the asphalt or concrete is identified during the pre-closure and structural assessment, soil samples may be collected from the area underlying the original material as indicated in Sections F.1.3.1.1 and F.2.3.1.1, as appropriate. Soil sampling procedures are presented in Section F.6.4.3. If the material has successfully been decontaminated or the crack did not extend to the soil, the underlying soil will be presumed to be uncontaminated and soil sampling will not be required.

When decontamination of the unit is complete, verification will be conducted as described in Section F.5.5. If sampling and analyses indicate that hazardous constituents are present above acceptable levels, as described in Section F.5.5, the wash cycles and verification analyses will continue until the surfaces, structures, or equipment have been decontaminated or the decision is made to proceed with an alternative demonstration of closure, as described in Section F.5.6. Upon determination that a surface or structure is waste, it may be removed, transported, and stored at other hazardous waste storage units to facilitate the closure process.

F.5.4.3 Decontamination Waste Management

Upon successful completion of decontamination wash down required for the closing unit, any remaining wash water will be collected, transferred to containers, sampled, and analyzed for the hazardous constituents identified in tables in Supplement F.1 and F.2, as appropriate. The results of this analysis will be used to determine if the excess wash water should be managed as hazardous or non-hazardous wastewater. The wastewater, PPE, and any other waste generated as a result of closure will be managed as outlined in Table F-2. All decontamination activities involving wash water will be conducted with secondary containment in order to prevent migration to surface soils or waters. In addition, all waste management operations will be subject to additional controls in the Contingency Plan (Appendix E of this permit modification submittal) to further prevent potential contamination should a spill or release occur. Subsequent disposition options for the decontaminated structures and equipment include reuse, recycling, or disposal.

F.5.4.4 Equipment Used During Closure

Reusable protective clothing, tools, and equipment used during decontamination activities will be cleaned with a mild wash water solution. Residue, disposable equipment, and reusable equipment that cannot be decontaminated will be containerized and managed as waste in accordance with LANL waste management procedures, depending on the regulated constituents present.

F.5.5 Verification of Decontamination

LANL proposes analysis of water and/or wipe samples for decontamination verification at the TRUWF using the following methods:

- When liquid sampling, the verification solution will be limited to an amount that is sufficient to wipe down the surface to be verified and collect the required number of samples. This will minimize dilution of hazardous constituents present at the location.
- For wipe sampling, guidance from the analytical laboratory must be obtained prior to wipe verification sampling to confirm that the solution chosen for each analysis is appropriate for the analysis to be conducted and that wipe sampling is a proper technique for the analysis.
- Sample area will be limited to a specific discrete location (e.g., a wall or portion thereof, depending on the size of the unit/equipment).
- Decontamination will be verified by comparing the discrete analytical results for liquid sampling to a baseline result (blank) obtained from the verification solution prior to its use for the verification wipe down. Comparison of wipe sample analytical results to an unused wipe media sample (blank) will be used to determine the presence or absence of contamination.

- If the result is at or below that of the blank, decontamination is verified for the discrete area sampled.
- If the result is above the blank, decontamination and verification will be repeated for the discrete location in accordance with Sections F.5.4 and F.5.5 of this closure plan; closure will be verified as described below; or the decision will be made to proceed with an alternative demonstration of closure, as described in Section F.5.6.

These proposed methods minimize dilution and establish criteria by which successful decontamination is verified. Analytical procedures will conform to the methods found in Section F.7.

F.5.5.1 Verification Criteria

Successful decontamination of the TRUWF will meet a minimum of one of the following criteria:

- No detectable RCRA-regulated constituent residues from the management of stored or treated authorized RCRA-regulated wastes are identified in samples collected during closure activities.
- Analytical results of samples collected during decontamination verification activities identify no statistically significant concentrations of RCRA-regulated constituents above baseline/background data.
- Detectable concentrations of RCRA-regulated constituents in samples collected during verification activities are at or below levels agreed upon with the NMED to be protective of human health and the environment, based on the results of risk assessment methods.
    - Comparison of the analytical results to the appropriate NMED Soil Screening Levels (SSLs) (NMED, 2006) and/or the LANL Ecological Screening Levels (ESLs) (LANL, 1999), or most current applicable document(s). If the result is below the SSL/ESL, the equipment/soil/surface will be considered free of contamination.
- Detectable concentrations of RCRA-regulated constituents that cannot be removed or decontaminated to acceptable levels, as described above, will be allowed to remain, provided that these RCRA-regulated constituents do not

pose an unacceptable risk when combined with technical or administrative control measures agreed upon with the NMED.

- Assessment of residual (i.e., above the SSL, ESL) contamination levels using an occupational risk scenario.

F.5.6 Alternative Demonstration of Closure

An alternative demonstration of closure may be justified at the TRUWF addressed in this plan if verification methods described in the previous section are not feasible. LANL proposes the following alternative demonstrations:

- All equipment/materials/surfaces of the storage unit have been recycled or disposed of in accordance with applicable regulatory requirements.
- Pursuant to 20.4.1.200 NMAC §261.3(f)(2), LANL has requested and the NMED has approved a determination that the debris is no longer contaminated with hazardous waste.
- Due diligence has been conducted to establish that contamination at the site is historical contamination (the difference between operating unit and historical operations cannot be distinguished) that should be addressed under corrective actions and not as part of the operating unit closure.

F.6 SAMPLE MANAGEMENT PROCEDURES

The following information presents general sample management and sampling equipment cleaning procedures shared in common for closure of the waste management unit described in this closure plan. Specific sampling strategies to be used for this closure to demonstrate decontamination, if necessary, are included in Supplements F.1 and F.2 of this closure plan.

Samples will be collected and transported using documented chain-of-custody and sample management procedures to ensure the integrity of the sample and provide an accurate and defensible written record of the possession and handling of a sample from the time of collection through laboratory analysis. Sample collection equipment will include sample identification labels, chain-of-custody forms, EPA-certified clean containers, clean sampling equipment, locked coolers, preservatives, and custody seals. The following provides a description of sample documentation; sample handling, preservation, and storage; and sample packaging and transportation requirements that will be followed during the sampling activities associated with the closure.

F.6.1 Sample Documentation

Sampling personnel will complete and maintain records to document sampling and analysis activities. Sample documentation will include sample identification numbers, chain-of-custody forms, analysis requested, sample logbooks detailing sample collection activities (i.e., date, time, sampling personnel, location, depths as applicable, weather conditions, geological information as applicable (QBT-3, QBT-4, etc.) unusual observations, variances, field and trip blanks, duplicates, replicates, and shipping forms (if necessary).

F.6.1.1 Chain-of-Custody

Chain-of-custody forms will be maintained by sampling personnel until the samples are relinquished to the analytical laboratory. One chain-of-custody form may be used to document all of the samples collected from a single sampling event. Several chain-of-custody forms may be required dependent upon the number of samples collected. The sample collector will be responsible for the integrity of the samples collected until properly transferred to another person. The EPA considers a sample to be in a person's custody if it is:

- In a person's physical possession,
- In view of the person in possession, or
- Secured by that person in a restricted access area to prevent tampering.

The sample collector will document all pertinent sample collection data. Individuals relinquishing or receiving custody of the samples will sign, date, and note the time on the analysis request/chain-of-custody form. A chain-of-custody form must accompany all samples from collection through laboratory analysis. The completed original chain-of-custody form will be returned by the analytical laboratory and will become a part of the permanent record documenting the sampling effort.

F.6.1.2 Sample Labels and Custody Seals

A sample identification label will be affixed to each sample container. The sample label will include the following information:

- A unique sample identification number;
- Name of the sample collector;
- Date and time of collection;
- Type of preservatives used, if any; and
- Location from which the sample was collected.

A custody seal will be placed on each sample container lid to detect unauthorized tampering with the samples. These labels must be initialed, dated, and affixed by the sample collector in such a manner that it is necessary to break the seal to open the container.

F.6.1.3 Sample Logbook

All pertinent information on the sampling effort must be recorded in a bound logbook. Information must be recorded in ink and any cross outs must be made with a single line and the change initialed and dated by the author. The sample logbook will include the following information:

- The sample location,
- Suspected composition,
- Sample identification number,
- Volume/mass of sample taken,
- Purpose of sampling,
- Description of sample point and sampling methodology,
- Date, time and year of collection,
- Name of the sample collector,
- Sample destination and how it will be transported,
- Observations, and
- Names of personnel responsible for the observations
- Depths as applicable

- Matrix (i.e., soil, water, sludge, air, etc.)
- Notation of field/trip blanks and duplicates/replicates
- Preservative as applicable
- Weather conditions
- Notation of unusual occurrences or exceedance of holding times
- Identification of field/sampling team leader and sampling team members
- Name(s) of subcontractor(s) if other than LANL
- Name of analytical lab samples being sent to
- Name of certifying professional engineer as applicable

F.6.2 Sample Handling, Preservation, and Storage

Samples will be collected and containerized in appropriate pre-cleaned (new) sample containers. Table F-3 presents the requirements in SW-846 (EPA, 1986) for sample containers, preservation techniques, and holding times. Samples that require cooling to 4 degrees Celsius will be placed in a locked cooler with ice or ice gel or in a locked refrigerator immediately upon collection.

F.6.3 Packaging and Transportation of Samples

All packaging and transportation activities will meet safety expectations, QA requirements, DOE Orders, and relevant local, state, and federal laws (including 10 CFR and 49 CFR). Appropriate LANL documents establish these requirements for packaging design, testing, acquisition, acceptance, use, maintenance, and decommissioning and for on-site, intra-site, and off-site shipment preparation and transportation of general commodities, hazardous materials, substances, wastes, and defense program materials.

Off-site transportation of samples will occur via private, contract, or common motor carrier; air carrier; or freight. All off-site transportation will be processed through the LANL Packaging & Transportation (P&T) Organization, unless the shipper is specifically authorized through formal documentation by the P&T Organization to independently tender shipments to common motor or air carriers. Shipping of samples must be conducted in compliance with DOT regulations and samples (if soils) must be screened for radioactive components prior to submitting to receiving P&T organization and shipping off-site to respective analytical laboratory.

F.6.4 Sample Collection Procedures

Samples will be collected in accordance with the most recent and appropriate LANL sampling plan incorporating guidance from the EPA (EPA, 2002) and DOE (DOE, 1995), or other approved procedures.

F.6.4.1 Liquid Sampling

For verification sampling, each discrete sample location will be wiped down with clean, deionized water. A mop, cloth, and/or other absorbent material will be immersed into the container and squeezed out prior to wiping down the discrete surface to be verified. Excess solution will be contained and collected in a bermed area, if necessary. To minimize dilution of the samples, the solution used for the wipe down will be limited to a quantity sufficient to collect the appropriate number of samples. Liquid sampling will be conducted using glass or plastic tubes, a composite liquid waste sampler, a bacon bomb, a Composite Liquid Waste Sampler (COLIWASA), a bailer, or by pouring liquid directly into sample containers.

F.6.4.2 Wipe Sampling

When surface wipe samples are used to determine if residual hazardous constituents remain within the TRUWF waste management unit, the samples will be taken in accordance with the National Institute of Occupational Safety and Health (NIOSH) *Manual of Analytical Methods*, Method 9100 (NIOSH, 1994), EPA SW-846, or other approved methodology. The appropriate use of wipe sample methods will be driven by the type of surface being sampled, the type of contaminant, the solution used, and the desired contaminant concentration detection limits. The NIOSH method includes wiping a 100 square centimeter area at each discrete location with a gauze wipe wetted with a liquid solution appropriate for the desired analysis (e.g., deionized water for lead). The solution used depends on the analysis; therefore, the analytical laboratory will be consulted prior to sampling activities to ensure that the correct solution is employed for each analysis and that wipe sampling is a proper technique for the analysis.

F.6.4.3 Soil Sampling

If necessary, soil will be sampled using a spade, scoop, auger, ring sampler, or trowel. Samples will be kept at four degrees Celsius or at their at-depth temperature or lower, protected from ultraviolet light, sealed tightly in the recommended container, and analyzed within the specific holding times listed in Table F-3.

F.6.5 Cleaning of Sampling Equipment

Reusable sampling equipment will be cleaned and rinsed prior to use. Sampling equipment rinsate blanks will be collected and analyzed only if reusable sampling equipment is used. Reusable decontamination equipment, including protective clothing and tools, used during closure activities will be scraped as necessary to remove residual material and cleaned with a mild wash water solution. Sampling equipment will be cleaned prior to each use with a wash solution, rinsed several times with tap water, and air-dried or wiped dry to prevent cross contamination of samples. As feasible, decontaminated and clean reusable sampling equipment may be stored in clean plastic storage bags or other similar bags. A disposable sampler is considered clean if still in a factory-sealed wrapper. Residue, disposable decontamination equipment, and reusable decontamination equipment that cannot be decontaminated will be containerized, managed and appropriately disposed of by an approved on-site facility.

F.7 ANALYTICAL REQUIREMENTS

The following information presents general analytical procedures approved for the closure of the waste management unit described in this closure plan. Specific analytical requirements to demonstrate decontamination, if necessary, are included in Supplements F.1 and F.2 of this closure plan.

F.7.1 Analytical Laboratory Requirements

The analytical laboratory will perform the detailed qualitative and quantitative chemical analyses specified in Supplements F.1 and F.2 of this closure plan. This analytical laboratory will have:

- A documented comprehensive QA/ QC program,
- Technical analytical expertise,
- A document control/records management plan, and

- The capability to perform data reduction, validation, and reporting.

The selection of the analytical testing methods identified in Supplement F.1 and F.2 was based on the following considerations:

- The physical form of the waste,
- Constituents of interest,
- Required detection limits (e.g., regulatory thresholds), and
- Information requirements (e.g., waste classification).

F.7.2 Quality Assurance/Quality Control

Field sampling procedures and laboratory analyses will be evaluated through the use of QA/QC samples to assess the overall quality of the data produced. QC samples evaluate precision, accuracy, and potential sample contamination associated with the sampling/analysis process, and are described in the following sections, along with information on calculations necessary to evaluate the QC results. QA/QC samples will be collected in accordance with the most recent and appropriate LANL sampling plan incorporating guidance from the EPA (EPA, 2002) and DOE (DOE, 1995), or other approved procedures. Analysis will be conducted in accordance with procedures given in SW-846 (EPA, 1986), or other approved procedures or methods.

F.7.2.1 Field Quality Control

The field QC samples that may be collected include trip blanks, field blanks, field duplicates, field replicates, and equipment rinsate blanks. Table F-4 presents a summary of QC sample types, applicable analyses, frequency, and acceptance criteria. QC samples will be given a unique sample identification number and submitted to the analytical laboratory as blind samples. QC samples will be identified on the applicable forms so that the results can be applied to the associated sample.

F.7.2.2 Analytical Laboratory QC Samples

QA/QC considerations are an integral part of analytical laboratory operations. Laboratory QA ensures that analytical methods generate data that are technically sound, statistically valid, and that can be documented. QC procedures are the tools employed to measure the degree to which these QA objectives are met.

F.7.3 Data Reduction, Verification, Validation, and Reporting

Analytical data generated by the activities described in this closure plan will be verified and validated. Data reduction is the conversion of raw data to reportable unit; transfer of data between recording media; and computation of summary statistics, standard errors, confidence intervals, and statistical tests.

F.7.4 Data Reporting Requirements

Analytical results will include all pertinent information about the condition and appearance of the sample-as-received. Analytical reports will include:

- A summary of analytical results for each sample;
- Results from QC samples such as blanks, spikes, and calibrations
- Reference to standard methods or a detailed description of analytical procedures; and
- Raw data printouts for comparison with summaries, false positives, sample qualifiers (i.e., U, J, B, etc.), method qualifiers (i.e., P, PM, IC, etc.)

The laboratory will describe off-normal sample preparations that occur during the analysis in sufficient detail so that the data user can understand how the sample was analyzed.

F.8 AMENDMENT OF THE CLOSURE PLAN

In accordance with 20.4.1.500 NMAC, §264.112(c) [10-1-03], LANL will submit a written change in the approved closure plan whenever:

- There are changes in operating plans or facility design that affect the closure plan, or
- There is a change in the expected date of closure, or
- Unexpected events occur during closure that requires modification of the approved closure plan.

LANL will submit a written request for a permit modification with a copy of the amended closure plan at least 60 days prior to the proposed change in unit design or operation or no later than 60 days after an occurrence of an unexpected event that affects the closure plan. If the unexpected event occurs during closure, the permit modification will be requested within 30 days of the occurrence. The Secretary of the NMED may request a modification of the closure plan under the conditions presented in the bulleted items above. LANL will submit the modified plan in accordance with the request within 60 days of notification or within 30 days of notification if a change in facility condition occurs during the closure process.

F.9 CLOSURE COST ESTIMATE, FINANCIAL ASSURANCE, AND LIABILITY REQUIREMENTS

In accordance with 20.4.1.500 NMAC, §264.140(c) [10-1-03], LANL, as a federal facility, is exempt from the requirements of 20.4.1.500 NMAC, Part 264, Subpart H [10-1-03], to provide a cost estimate, financial assurance mechanisms, and liability insurance for closure actions.

F.10 CLOSURE CERTIFICATION REPORT

Upon completion of the closure activities at the TRUWF, a closure certification report will be prepared and submitted to the Secretary of the NMED. The report will document the closure and contain the following:

- A copy of the certification described in Section F.2.2 of this closure plan.
- Any significant variance from the approved activities and the reason for the variance.
- A summary of all sampling results, showing:
  - -Sample identification
  - -Sampling location
  - -Datum reported
  - -Detection limit for each datum
  - -A measure of analytical precision (e.g., uncertainty, range, variance)
  - -Identification of analytical procedure
  - -Identification of analytical laboratory.
- A QA/QC statement on analytical data validation and decontamination verification.

- The location of the file of supporting documentation, including:

  -Field logbooks

  -Laboratory sample analysis reports

  -QA/QC documentation

  -Chain-of-custody forms.

- Storage or disposal location of regulated hazardous/mixed waste resulting from closure activities.

- A certification of accuracy of the report.

F.11 NEW MEXICO ENVIRONMENT DEPARTMENT CLOSURE ASSESSMENT

LANL will notify the NMED Hazardous Waste Bureau (HWB) prior to the pre-closure and structural assessment of the waste management unit, described in Section F.5.3.2, to provide an opportunity to participate in the unit's physical condition review. LANL may also arrange for other on-site reviews of closure activities at reasonable times upon request by NMED representatives. Upon submittal of the closure certification report described in Section F.10 of this closure plan, LANL will arrange an on-site closure review with representatives of the HWB or equivalent NMED representatives to assess the completion of the closure activities for the waste management unit. LANL may also arrange for other on-site reviews of prior closure activities during the closure period at reasonable times upon request by NMED representatives.

F.12 REFERENCES

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Table F-1

Closure Schedule for the Storage/Treatment Unit at the Transuranic Waste Facility

Activity	Maximum Time Required [a]
Submit amended closure plan, if necessary.	-90 Days
Notify the New Mexico Environment Department (NMED) of intent to close.	-45 Days
Conduct pre-closure and structural assessment.	-25 Days
Final receipt of waste.	Day 0
Remove stored waste.	Day 5
Decontaminate surfaces and equipment.	Day 20
Sample excess decontamination materials for disposal. Perform equipment swipes or monitoring, as necessary.	Day 20
Perform verification sampling.	Day 30
Evaluate analytical data from verification sampling.	Day 50
Perform additional decontamination, if necessary.	Day 55
Perform additional verification sampling, if necessary.	Day 60
Evaluate additional analytical data.	Day 75
Perform final cleanup and disposal (i.e., removal of decontaminated equipment and decontamination waste).	Day 140
Prepare closure certification report.	Day 150
Certify closure.	Day 175
Submit final report to NMED.	Day 180

[a] The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously and/or may not require the maximum time listed. Extensions to this schedule may be requested, as needed.

Table F-2

Potential Waste Materials, Waste Types, and Disposal Options

Potential Waste Materials	Waste Types	Disposal Options
Personal protective equipment (PPE)	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	The PPE will be treated to meet Land Disposal Restriction (LDR) treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	Technical Area 54 (TA-54) Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or the Waste Isolation Pilot Plant (WIPP), as appropriate.
Decontamination wash water	Non-regulated liquid waste	Sanitary sewer
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Radioactive liquid waste	Radioactive Liquid Waste Treatment Facility (RLWTF)
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Verification water	Non-regulated liquid waste	Sanitary sewer
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Radioactive liquid waste	RLWTF
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Metal buildings	Non-regulated solid waste	Subtitle D landfill or recycled
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	TA-54 Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.

Table F-2 (continued)

Potential Waste Materials, Waste Types, and Disposal Options

Potential Waste Materials	Waste Types	Disposal Options
Discarded asphalt	Non-regulated solid waste	Subtitle D landfill, recycled, or reused
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	TA-54 Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Discarded concrete	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	TA-54 Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Discarded waste management equipment	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	TA-54 Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.
Sampling equipment	Non-regulated solid waste	Subtitle D landfill
	Hazardous waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.
	Low-level radioactive solid waste	TA-54 Area G or off-site radioactive waste disposal facility
	Mixed waste	Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.

Table F-3

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container Type and Materials	Preservation	Holding Time
Metals			
TCLP Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver	Aqueous Media: 500-mL Wide-Mouth-Polyethylene or Glass with Teflon Liner	Aqueous Media: HNO_3 to pH <2 Cool to 4°C	180 Days
	Solid Media: 125-mL Glass	Solid Media: Cool to 4°C	
TCLP/Total Mercury	Aqueous Media: 500-mL Wide-Mouth-Polyethylene or Glass with Teflon Liner	Aqueous Media: HNO_3 to pH <2 Cool to 4 °C	28 Days
	Solid Media: 125-mL Glass	Solid Media: Cool to 4°C	
Volatile Organic Compounds			
Target Compound Volatile Organic Compounds	Aqueous Media: Two 40-mL Amber Glass Vials with Teflon-Lined Septa	Aqueous Media: HCl to pH<2 Cool to 4 °C	14 days
	Solid Media: 125-mL Glass or Two 40-mL Amber Glass Vials with Teflon-Lined Septa	Solid Media: Cool to 4°C Add 5 mL Methanol or Other Water Miscible Organic Solvent to 40-mL Glass Vials	
Semi-Volatile Organic Compounds			
Target Compound Semi-volatile Organic Compounds	Aqueous Media: Four 1-L Amber Glass with Teflon-Lined Lid	Aqueous Media: Cool to 4 °C	Seven days from field collection to preparative extraction. 40 days from preparative extraction to determinative analysis.
	Solid Media: 250-mL Glass	Solid Media: Cool to 4°C	

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations.
[b] Information obtained from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, U.S. Environmental Protection Agency, 1986 and all approved updates.

°C = degrees Celsius
HNO_3 = nitric acid
HCl = hydrochloric acid
L = Liter
mL = milliter
TCLP = Toxicity Characteristic Leaching Procedure

Table F-4

Recommended Quality Control Sample Types, Applicable Analyses, Frequency, and Acceptance Criteria

QC Sample Type	Applicable Analysis [a]	Frequency	Acceptance Criteria
Trip Blank	VOC	One set per shipping cooler containing samples to be analyzed for VOCs	Not Applicable
Field Blank	VOC/SVOC, metals	One sample daily per analysis	Not Applicable
Field Duplicate	Chemical	One for each sampling sequence	Relative percent difference less than or equal to 20 percent
Equipment Rinsate Blank[b]	VOC/SVOC, metals	One sample daily	Not Applicable

[a] For VOC and SVOC analysis, if blank shows detectable levels of any common laboratory contaminant (e.g., methylene chloride, acetone, 2-butanone, toluene, and/or any phthalate ester), sample must exhibit that contaminant at a level 10 times the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5 times the quantitation level to be considered detectable.
[b] Collected only if reusable sampling equipment used.
QC = quality control
VOC = volatile organic compound
SVOC = semi-volatile organic compound

SUPPLEMENT F.1

SPECIFIC DECONTAMINATION, SAMPLING, AND ANALYSIS ACTIVITIES FOR THE CLOSURE OF THE INDOOR PORTION OF THE TRANSURANIC WASTE FACILITY (TRUWF) CONTAINER STORAGE/TREATMENT UNIT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	foot/feet
LANL	Los Alamos National Laboratory
TA	Technical Area
TRUWF	Transuranic Waste Facility

SPECIFIC DECONTAMINATION, SAMPLING, AND ANALYSIS ACTIVITIES FOR CLOSURE OF THE INDOOR PORTION OF THE TRANSURANIC WASTE FACILITY CONTAINER STORAGE/TREATMENT UNIT

F.1.1. INTRODUCTION

This attachment describes specific decontamination, sampling strategies, and analytical requirements applicable to closure of indoor portion of the Los Alamos National Laboratory (LANL) Transuranic Waste Facility (TRUWF) container storage/treatment unit. General closure procedures for the waste management units are presented in the closure plan (Appendix F). The general procedures include removal and appropriate disposition of the waste inventory in the unit prior to the beginning of closure, and a pre-closure and structural assessment of the unit, as described in Section F.5.3.2 of the closure plan, for conditions that may adversely affect decontamination and verification sampling activities.

The waste management unit addressed in this attachment is the indoor portion of the TRUWF. The TRUWF will be located at Technical Area (TA) 52, Building 190. Indoor storage at the TRUWF will include a main storage area; indoor shipping and receiving area; and a packaging, repackaging, decontamination, and size reduction area. Table F.1-1 identifies the category, U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers, and specific constituents of concern for the wastes stored/treated at the TRUWF.

Closure activities at the TRUWF will include decontamination, recycling, reuse, and/or disposal of portable equipment; decontamination of floors and/or walls of the container storage/treatment unit; reuse, recycling, and/or disposal of concrete (based on information in the operating record); and disposal of waste materials generated during closure activities.

Decontamination will be conducted as described in Section F.5.4 of the closure plan (Appendix F) and in Section F.1.2 herein. Sampling will be conducted in accordance with the most recent LANL sampling and analysis plan incorporating guidance from the EPA (EPA, 2002) and the U.S. Department of Energy (DOE) (DOE, 1995). Section F.1.3 in this supplement and Section F.6 of the closure plan describe sampling activities and sample collection procedures, respectively. Analysis will be conducted in accordance with procedures given in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (EPA, 1986), or other approved procedures or methods. Analytical requirements are provided in Section F.1.4 herein and in

Section F.7 of the closure plan. All waste generated will be managed in accordance with applicable regulatory requirements and all waste will be removed from the waste management unit as specified in Section F.5.2 of the closure plan.

F.1.2. SPECIFIC DECONTAMINATION PROCEDURES

To the extent necessary, all contaminated equipment present at closure, surfaces, and structures will be decontaminated. Sampling and analysis will be performed, as necessary, to verify that decontaminated equipment, surfaces, and structures meet the verification criteria specified in Section F.5.5 of the closure plan. Discarded materials and equipment that cannot or will not be decontaminated will be dispositioned appropriately.

Many of the materials and equipment associated with the closure of the TRUWF will be handled as solid and potentially hazardous wastes when removed as described in this attachment. In these cases, these wastes will be characterized to meet applicable waste acceptance criteria using appropriate LANL waste management procedures.

F.1.2.1. Equipment Decontamination

The decontamination needs for equipment present in the TRUWF will be reviewed during the pre-closure and structural assessment described in Section F.5.3.2 of the closure plan. In most cases, mixed waste will be stored in the TRUWF and any detected radioactivity above background levels will serve as an indicator for potential contamination by hazardous constituents. Any portable equipment in the TRUWF storage/treatment areas will be swiped or monitored using radioassay procedures or equipment to determine the presence of contaminants before the equipment is removed. Depending upon the results of this assay, the final use or disposition of the equipment will be determined based upon the appropriate regulations or DOE policies. In other cases, the potential for contamination by hazardous waste or hazardous constituents will be determined based upon the review of the operating record for the waste management unit.

Prior to decontamination of the main surfaces at the TRUWF, contaminated portable equipment (if present) to be removed from the areas will be wiped down, when appropriate, with a wash water solution in accordance with the general procedures described in Section F.5.4.1 of the closure plan. The equipment may include items such as pallets and miscellaneous waste management equipment (e.g., drum dollies, glove boxes).

F.1.2.2. Surfaces/Structures Decontamination

The surfaces and structures (e.g., floors and walls) of the indoor areas will be decontaminated if determined to be necessary during the pre-closure and structural assessment discussed in Section F.5.3.2 of the closure plan. Only the floor where hazardous/mixed waste was stored and the adjacent walls will be decontaminated; the walls will be decontaminated to a height of one foot (ft) above the highest level of waste previously stored in the unit. After decontamination of the floors and walls, any present containment system (e.g., sumps, berms) will be wiped down and any excess wash water will be transferred to containers for characterization and disposition. Decontamination of container storage/treatment unit surfaces and structures will be performed in accordance with the general procedures described in Section F.5.4.2 of the closure plan. After the decontamination process, the excess wash water will be collected, sampled for analysis, and stored in appropriate containers at the site. Each surface or structure may undergo several wash cycles; however, the option to remove the material and manage it as waste may be exercised at any time.

F.1.3. SAMPLING ACTIVITIES

All general sample management, documentation, handling, preservation, storage, and packaging and transportation procedures for the closure of the TRUWF are described in Section F.6 of the closure plan. The following specific information applies to the sampling strategy and approach for closure of the TRUWF. Samples will be collected from each of the discrete locations according to the methods and procedures provided in Section F.6.4 of the closure plan and analyzed for the appropriate hazardous constituents identified during the pre-closure and structural assessment described in Section F.5.3.2 of the closure plan.

F.1.3.1. Sampling Strategy/Approach

Sampling will be conducted to verify that decontamination efforts described herein and in Section F.5.4 of the closure plan were effective at removing hazardous waste residues.

F.1.3.1.1. Soil Sampling Strategy

Storage within the indoor portion of the TRUWF will include storage on secondary containment, when liquids are present, and will be located within the main building structure to prevent run-on from flooding or precipitation. The concrete floors making up the units will be coated with a chemical-resistant epoxy primer and paint, which will effectively prevent the migration of any liquids through the concrete and into the environment. Pending the results of the pre-closure and structural assessment described in Section F.5.3.2 of the closure plan, these features will have prevented the release of hazardous constituents to the surrounding environment. Therefore, soil sampling will not be applicable for the indoor areas of the TRUWF unless the structural assessment and operating record indicate otherwise. In that case, LANL will notify the New Mexico Environment Department to discuss further proposals, such as utilizing the soil sampling techniques contained in Section F.6.4.3 of the closure plan.

F.1.3.1.2. Verification Sampling Strategy

Verification samples will be collected from each of the locations where decontamination activities described in Section F.1.2 were performed. Liquid or wipe sampling will be used for decontamination verification of surfaces and structures (e.g., walls, concrete floors, and equipment). Verification sampling will be conducted for the floor and then the walls to prevent cross contamination of the samples and allow for the identification of contaminated areas. After decontamination, at least one sample for every 12-ft x 5-ft area will be collected, with no fewer than two samples taken from the floor of the main storage area and the repackaging/size reduction area. At least one sample will be taken from the floor of the shipping receiving area and the characterization area. The decontaminated walls will also be sampled every 12-ft X 5-ft. Samples will be collected from discrete locations according to the applicable procedure in Section F.6.4 of the closure plan and analyzed by an independent laboratory for the appropriate hazardous constituents identified during the pre-closure and structural assessment described in Section F.5.3.2 of the closure plan. Table F.1-1 identifies specific hazardous waste constituents of concern for the TRUWF. Tables F.1-1 and F.1-2 will be modified, if necessary, at the time of notification of closure to incorporate changes based on the operating record review that will be conducted for the TRUWF.

In some cases, equipment removed from the TRUWF may not be amenable to liquid wash down procedures due to its size or composition. This equipment may include items such as analytical instrumentation. In such cases, the use of wipe samples to determine whether hazardous waste constituents are present may be appropriate. The use of radioactive swipe samples as surrogates may also be employed for the closure of the TRUWF where the preliminary review of the operating records indicate only mixed waste containers were stored.

Wipe samples will be collected in accordance with the procedure in Section F.6.4.2 of the closure plan.

F.1.4. ANALYTICAL REQUIREMENTS

All general analytical requirements, quality assurance/quality control, and data requirements procedures for closure of the TRUWF container storage/treatment unit are described Section F.7 of the closure plan.

Analytical methods to be used for decontamination verification during the TRUWF container storage/treatment unit closure activities are summarized in Table F.1-2. Each sample will be analyzed for the constituents identified in Table F.1-1, as appropriate. Analytes, test methods/instrumentation, target detection limits, and rationale for metals and organic analyses are also presented in Table F.1-2.

F.1.5. WASTE MANAGEMENT

Decontamination and sample collection activities will be conducted with waste minimization goals in mind. All waste material generated will be controlled, handled, characterized, and disposed of in accordance with LANL waste management procedures. Table F-3 in the closure plan provides a list of the waste materials that could be generated during closure and potential disposal options.

F.1.6. REFERENCES

DOE, 1995. “DOE Methods for Evaluating Environmental and Waste Management Samples,” DOE/EM-0089T, Rev. 2. Prepared for the U.S. Department of Energy by Pacific Northwest Laboratory, Richland, Washington.

EPA, 1986 and all approved updates. “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA-*SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

EPA, 2002. “RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment,” EPA530-D-02-002, August 2002, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C.

Table F.1-1[a]

Hazardous Waste Constituents of Concern at the Transuranic Waste Facility[b]

Category	EPA Hazardous Waste Numbers	Specific Constituents
Toxic Metals		
Volatile Organic Compounds		
Semi-Volatile Organic Compounds		

[a] This table will be populated after storage at the unit occurs
[b] Based on the unit operating record.
EPA = U.S. Environmental Protection Agency

Table F.1-2

Summary of Proposed Analytical Methods

Analyte	EPA SW-846 Analytical Method [a]	Test Methods/ Instrumentation	Target Detection Limit [b]	Rationale
Metal Analysis				
Arsenic	7060A [c], 7061A	FLAA, GFAA	10 ug/L	Determine the metal concentration in the samples.
Barium	7080A [d], 7081 [c]	FLAA, GFAA	200 ug/L	
Cadmium	7130 [d], 7131A [c]	FLAA, GFAA	2 ug/L	
Chromium	7190 [d], 7191 [c]	FLAA, GFAA	10 ug/L	
Lead	7420 [d], 7421 [c]	FLAA, GFAA	5 ug/L	
Mercury	7470A, 7471A [e]	CVAA	0.2 ug/L	
Selenium	7740[c], 7741A	FLAA, GFAA	5 ug/L	
Silver	7760A[d], 7761 [c]	FLAA, GFAA	10 ug/L	
Organic Analysis				
Target compound list VOCs	8260B	GC/MS	10 mg/L	Determine the VOCs concentration in the samples.
Target compound list SVOCs	8270D [c]	GC/MS	10 mg/L	Determine the SVOCs concentration in the samples.

[a] U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” SW-846.
[b] Detection limits listed for metals are for clean water. Detection limits for organics are expressed as practical quantitation limits. Actual detection limits may be higher depending on sample composition and matrix type.
[c] Method being integrated into Method 7010, per the May 1998 SW-846 Draft Update IVA.
[d] Method being integrated into Method 7000B, per the May 1998 SW-846 Draft Update IVA.
[e] Method being revised to 7471B per the May 1998 SW-846 Draft Update IVA.

CVAA = Cold-vapor atomic absorption spectroscopy
FLAA = Flame atomic absorption spectroscopy
GC/MS = Gas chromatography/mass spectrometry
GFAA = Graphite furnace atomic absorption spectroscopy
mg/L = milligrams per liter SVOC = semi volatile organic compounds
ug/L = micrograms per liter.
VOC = volatile organic compounds

SUPPLEMENT F.2

SPECIFIC DECONTAMINATION, SAMPLING, AND ANALYSIS ACTIVITIES FOR THE CLOSURE OF THE OUTDOOR PORTION OF THE TRANURANIC WASTE FACILITY (TRUWF) CONTAINER STORAGE/TREATMENT UNIT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	feet
in.	inch/inches
LANL	Los Alamos National Laboratory
TA	Technical Area
TRUWF	Transuranic Waste Facility

SPECIFIC DECONTAMINATION, SAMPLING, AND ANALYSIS ACTIVITIES FOR CLOSURE OF THE OUTDOOR PORTION OF THE TRANSURANIC WASTE FACILITY OUTDOOR CONTAINER STORAGE/TREATMENT UNIT

F.2.1. INTRODUCTION

This attachment describes specific decontamination, sampling strategies, and analytical requirements applicable to closure of the outdoor portion of the proposed Los Alamos National Laboratory (LANL) Technical Area 52 Transuranic Waste Facility (TRUWF) Container Storage/Treatment Unit. General closure procedures for the TRUWF hazardous waste management unit is presented in the closure plan (Appendix F). The general procedures include removal and appropriate disposition of the waste inventory in the unit prior to the beginning of closure, and a pre-closure and structural assessment of the unit, as described in Section F.5.3.2 of the closure plan, for conditions that may adversely affect decontamination and verification sampling activities.

The waste management unit addressed in this attachment is the outdoor storage area of the TRUWF, which will consist of an asphalt and concrete pad that will not be lined or coated and will be located on the southwestern end of the proposed TRUWF. The TRUWF outdoor storage pad will mostly be used to temporarily store loaded waste trucks prior to shipment to an off-site treatment, storage, or disposal facility. The trailer parking area will also be located on the southern side outside the TRUWF to conduct characterization and certification activities. This curbed and fenced area will have sufficient characterization capabilities to perform certifications on transuranic wastes. Table F.2-1 identifies the category, U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers, and specific constituents of concern for the wastes stored at this unit.

Closure activities at the TRUWF will include decontamination, reuse, recycling, and/or disposal of transportainers and/or portable equipment; decontamination, reuse, or removal portions of the storage pad (based on information in the operating record); removal of soil if determined to be contaminated above acceptable levels (based on information in the operating record or determined through analysis); and disposal of soils and/or waste materials generated during closure activities.

Decontamination will be conducted as described in Section F.5.4 of the closure plan (Appendix F) and in Section F.2.2 herein. Sampling will be conducted in accordance with the most recent LANL sampling and analysis plan incorporating guidance from the EPA (EPA, 2002) and the U.S. Department of Energy (DOE) (DOE, 1995). Section F.2.3 in this supplement and Section F.6 of the closure plan describe sampling activities and sample collection procedures, respectively. Analysis will be conducted in accordance with procedures given in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) (EPA, 1986), or other approved procedures or methods. Analytical requirements are provided in Section F.2.4 herein and in Section F.7 of the closure plan. All waste generated will be subsequently reclaimed, recycled, or disposed of in accordance with applicable regulatory requirements. All wastes will be removed from the permitted unit as specified in Section F.5.2 of the closure plan.

F.2.2. SPECIFIC DECONTAMINATION PROCEDURES

To the extent necessary, all contaminated equipment, surfaces, structures, and media present at closure will be decontaminated. Sampling and analysis will be performed, as necessary, to verify that decontaminated equipment, surfaces, structures, and media meet the verification criteria specified in Section F.5.5 of the closure plan. Discarded materials and equipment that cannot or will not be decontaminated will be dispositioned appropriately.

F.2.1.1. Equipment Decontamination

Prior to decontamination of the outdoor storage pad at the TRUWF, any contaminated pallets and other portable miscellaneous waste management equipment (e.g., drum dollies) will be wiped down with a wash water solution in accordance with the general procedures described in Section F.5.4.1 of the closure plan.

F.2.1.2. Portable Structure Decontamination

If transportainers or other portable structures are used for storage on the outdoor storage pad at the TRUWF, normal operations will not expose outer surfaces of transportainers to waste. Therefore, if there is no evidence of outer surface contamination by a spill or leakage from interior spills, the outer surfaces will not be decontaminated. If the pre-closure and structural assessment indicates outer surfaces of a structure(s) may be contaminated, those surfaces will be decontaminated in accordance with the procedures described below.

If determined to be necessary, decontamination of internal surfaces of transportainers will involve removing any contamination through washing the surfaces with appropriate decontamination solutions until decontamination is achieved. Decontamination of internal surfaces will be performed in accordance with the general procedures described in Section F.5.4.2 of the closure plan. The walls of the structure will be decontaminated to a height of 5 ft. The floor will also be decontaminated. After the decontamination process, the used wash water will be collected, sampled for analysis, and stored in appropriate containers at the site pending determination of appropriate disposition.

F.2.1.3. Storage Pad Decontamination

Review of operating records, analytical results, and visual inspection will be relied on to determine if the asphalt pad outside the TRUWF is potentially contaminated by hazardous constituents resulting from waste management operations. If records indicate that no release of hazardous waste to soils has occurred, decontamination will not be conducted. Suspected areas of contamination will be removed from the pad or washed with a wash water solution. Removal, containerization, and disposal of contaminated asphalt is likely to be the option of choice. If decontamination of the pad is chosen, decontamination will be conducted as outlined in Section F.5.4.2 of the closure plan. The used wash water will be collected and transferred from the portable berm used to contain excess wash water to a container for waste characterization sampling.

After decontamination of the asphalt pad, used wash water may exhibit high levels of organic compounds due to leaching of the asphalt during washdown. If this occurs, record reviews (e.g., manufacturer's specifications, Material Safety Data Sheets) and additional analyses may be performed to determine if leaching organics from the asphalt contributed to the organic compound concentration in the used wash water. If the asphalt is the source of organic contamination, baseline concentrations for the verification solution will be adjusted accordingly. If decontamination verification cannot be demonstrated, the container storage pad may be evaluated using an alternative demonstration of closure. If all alternative demonstrations of closure fail, the container storage pad will be removed.

F.2.1.4. Contaminated Soil Removal

Record reviews and visual inspection of soils along the margins of the outdoor storage area at the TRUWF will be conducted during the pre-closure and structural assessment and used to identify areas where soil contamination from waste management activities may have occurred. If records indicate that no release of hazardous waste to soils has occurred and no staining is seen, no soil sampling will be conducted. If required, soil sampling in any areas that are suspected to be contaminated as a result of storage at the outdoor area will be conducted following sample collection procedures in Section F.6.4.3 of the closure plan. For example, soil sampling would be conducted in areas where the operating records indicate that a release of hazardous waste from storage activities the surrounding soil has occurred and/or areas where a crack in the asphalt penetrated through the asphalt. A statistically representative number of soil samples will be collected from contaminated area(s) to a 6-inch (in.) depth. Sampling locations to determine the extent of contamination will be chosen using a biased sampling approach, including areas with historical evidence of releases, visual staining, and any other information that indicates potential contamination. These samples will be compared to background/baseline concentrations. Background samples will be established using analysis results from soil samples collected from appropriate areas before closure activities begin or, if available, established baseline concentration levels for the area (e.g., using corrective action program analytical data).

If contamination resulting from container storage activities is discovered above acceptable levels as described in the verification criteria listed in Section F.5.5 of the closure plan, the contaminated soils will be removed for proper disposal. Soil sampling results that are above background/baseline levels will be used to identify the extent of soil contamination. Contaminated soils will be removed in layers and verification sampling will be conducted in accordance with Section F.2.3.1.1 following removal of each layer. This procedure will be used to minimize the amount of soil removed. If analysis from the verification indicates it does not meet acceptable levels after removal of each layer, more soil will be removed and verification sampling will be repeated, or the decision will be made to proceed with an alternative demonstration of closure, as described in Section F.5.6 of the closure plan.

F.2.3. SAMPLING ACTIVITIES

All general sample management, documentation, handling, preservation, storage, and packaging and transportation procedures for the closure of the TRUWF are described in Section F.6 of the closure plan. The following specific information applies to the sampling location strategy and approach for closure of the TRUWF. Samples will be collected from discrete locations according to the methods and procedures provided in Section F.6.4 of the closure plan and analyzed for the appropriate hazardous constituents identified during the pre-closure and structural assessment described in Section F.5.3.2 of the closure plan. Table F.2-1 identifies potential hazardous waste constituents of concern for the TRUWF. Samples will be analyzed by an independent analytical laboratory for the constituents included in Table F.2-1, as necessary, using the methods outlined in Table F.2-2. Tables F.2-1 and F.2-2 will be modified, if necessary, at the time of notification of closure to incorporate changes based on the operating record review that will be conducted for the container storage/treatment unit.

F.2.1.5. Sampling Strategy/Approach

Verification sampling will be conducted to verify that decontamination efforts described herein and in Section F.5.4 of the closure plan were effective at removing hazardous residues. Soil sampling may initially be conducted to establish the presence or absence of contamination.

F.2.1.5.1. Soil Sampling Strategy

Sampling locations to determine the extent of contamination will be chosen using a biased sampling approach, based on historical evidence of releases, physical evidence of distressed vegetation, visual staining, and any other information that indicates potential contamination. Soil samples will be collected using the procedures in Section F.6.4.3 of the closure plan. At least two and up to eighteen samples will be collected to a 6-in. depth around the perimeter of the pad. Individual locations and depths will be determined during the pre-closure and structural assessment of the unit, as described in Section F.5.3.2 of the closure plan. Analytical results will be compared to background samples and/or baseline concentration levels, as described in Section F.2.4.

F.2.1.5.2. Verification Sampling Strategy

Verification samples will be collected from each of the locations where decontamination activities were performed. Liquid or wipe sampling will be conducted using the procedures in Sections F.6.4.1 and F.6.4.2 of the closure plan; sampling results will be used for decontamination verification of the asphalt pad, portable structure walls and floors, or equipment. Soil sampling will be conducted for soil verification sampling. For the characterization trailers, one sample will be collected for every 12-ft x 5-ft area, and on the pad one sample will be collected for every 12-ft x 12-ft area. No fewer than two samples will be collected and analyzed for the hazardous constituents identified by the pre-closure and structural assessment, described in Section F.5.3.2 of the closure plan. Verification sampling will be conducted for the walls of the transportainer and then the floor to prevent cross contamination of the samples. If required to verify that contaminated soil removal was effective, at least two and a maximum of eight verification samples will be collected within the outdoor storage pad area when soil removal is complete.

F.2.4. ANALYTICAL REQUIREMENTS

All general analytical requirements, quality assurance/quality control, and data requirements procedures for closure of the outdoor storage area at the TRUWF are described Section F.7 of the closure plan. Analytical methods to be used for decontamination verification during the outdoor storage area closure activities are summarized in Table F.2-2. Each sample will be analyzed for the constituents identified in Table F.2-1, if applicable. Analytes, test methods/instrumentation, target detection limits, and rationale for metals and organic analyses are also presented in Table F.2-2.

F.2.5. WASTE MANAGEMENT

Decontamination and sample collection activities will be conducted with waste minimization goals in mind. All waste generated will be controlled, handled, characterized, and disposed of in accordance with LANL waste management procedures. Closure activities may generate different types of waste materials, which are listed with potential disposal options in Table F-2 of the closure plan.

F.2.6. REFERENCES

DOE, 1995. “DOE Methods for Evaluating Environmental and Waste Management Samples,” DOE/EM-0089T, Rev. 2. Prepared for the U.S. Department of Energy by Pacific Northwest Laboratory, Richland, Washington.

EPA, 1986 and all approved updates. “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA-*SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

EPA, 2002. "RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment," EPA530-D-02-002, August 2002, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C.

Table F.2-1[a]

Hazardous Waste Constituents of Concern at the Transuranic Waste Facility[b]

Category	EPA Hazardous Waste Numbers	Specific Constituents
Toxic Metals		
Volatile Organic Compounds		
Semi-Volatile Organic Compounds		

[a] This table will be populated after storage at the unit occurs
[b] Based on the unit operating record.
EPA = U.S. Environmental Protection Agency

Table F.2-2

Summary of Proposed Analytical Methods

Analyte	EPA SW-846 Analytical Method [a]	Test Methods/ Instrumentation	Target Detection Limit [b]	Rationale
Metal Analysis				
Arsenic	7060A [c], 7061A	FLAA, GFAA	10 ug/L	Determine the metal concentration in the samples.
Barium	7080A [d], 7081 [c]	FLAA, GFAA	200 ug/L	
Cadmium	7130 [d], 7131A [c]	FLAA, GFAA	2 ug/L	
Chromium	7190 [d], 7191 [c]	FLAA, GFAA	10 ug/L	
Lead	7420 [d], 7421 [c]	FLAA, GFAA	5 ug/L	
Mercury	7470A, 7471A [e]	CVAA	0.2 ug/L	
Selenium	7740[c], 7741A	FLAA, GFAA	5 ug/L	
Silver	7760A[d], 7761 [c]	FLAA, GFAA	10 ug/L	
Organic Analysis				
Target compound list VOCs	8260B	GC/MS	10 mg/L	Determine the VOC concentration in the samples.
Target compound list SVOCs	8270D [c]	GC/MS	10 mg/L	Determine the SVOC concentration in the samples.

[a] U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” SW-846.
[b] Detection limits listed for metals are for clean water. Detection limits for organics are expressed as practical quantitation limits. Actual detection limits may be higher depending on sample composition and matrix type.
[c] Method being integrated into Method 7010, per the May 1998 SW-846 Draft Update IVA.
[d] Method being integrated into Method 7000B, per the May 1998 SW-846 Draft Update IVA.
[e] Method being revised to 7471B per the May 1998 SW-846 Draft Update IVA.

CVAA = Cold-vapor atomic absorption spectroscopy
FLAA = Flame atomic absorption spectroscopy
GC/MS = Gas chromatography/mass spectrometry
GFAA = Graphite furnace atomic absorption spectroscopy
mg/L = milligrams per liter
SVOC = semi volatile organic compounds
ug/L = micrograms per liter
VOC = volatile organic compounds

APPENDIX G

CONTAINER STORAGE AND MANAGEMENT

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

%	percent
20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
CAM	continuous air monitor
CAS	Central Alarm Station
cm	centimeter
DOT	U.S. Department of Transportation
ft	feet/foot
gal	gallon
HAZMAT	hazardous materials
HENC	high efficiency neutron counter
HEPA	high-efficiency particulate air
HSGS	head space gas sampling
HVAC	heating, ventilating, and air conditioning
in.	inches
LACFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
m^3	cubic meters
NDT	non-destructive testing
PA	public address
PPE	personal protective equipment
ppmw	parts per million by weight
RTR	real-time radiography
sf	square feet
SWB	standard waste box
TA	technical area
TE	thermal equilibrium
TRU	transuranic

LIST OF ABBREVIATIONS/ACRONYMS (continued)

TRUPACT	Transuranic Waste Package Transporter
TRUWF	Transuranic Waste facility
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

APPENDIX G
CONTAINER STORAGE

The information provided in this section is submitted to address the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.15 and 20.4.1 NMAC, Subpart V, Part 264, Subpart I, revised October 1, 2003 [10-01-03] for the proposed Technical Area (TA) 52 Transuranic Waste Facility (TRUWF). The TRUWF will be a waste processing facility and its primary designed use will be for storing and preparing waste in containers for shipment to off-site facilities for final disposition. The main waste type managed will be non-liquid although activities at the TRUWF will include those necessary to prepare potentially liquid containing wastes to meet waste acceptance criteria (WAC) for off-site facilities.

This section provides detailed descriptions of the container storage/treatment unit to be located at the TRUWF and the waste management procedures to be used there. Detailed conceptual design engineering drawings are provided as Figures G-2, G-3, and G-4 for informational purposes only. Table G-1 summarizes applicable regulatory references for container storage and the corresponding location where the requirement is addressed in this document. As the TRUWF is a proposed unit, these descriptions represent those available at this point in the project and may be revised as determined to be necessary subject to approval before construction begins.

G.1. CONTAINER STORAGE AT THE TRANSURANIC WASTE FACILITY

The TRUWF will be located at TA-52, Building 190 in the north central portion of Los Alamos National Laboratory (LANL) on a mesa between a branch of Mortandad Canyon on the north and Pajarito Canyon on the south. Construction of the requested permitted building is currently scheduled to begin in 2010 to facilitate meeting the integrated near- and long-term waste management needs at LANL. Completion of the project is currently scheduled for 2012. This hazardous waste management unit will be located on approximately 7 acres and will be approximately 28,000 square feet (sf). The TRUWF will be located on a previously undeveloped parcel of land and in close proximity to facilities where wastes expected to be managed at the unit are generated. The following sections provide general information on hazardous waste container storage and treatment in containers, general dimensions of the unit, containment features, and materials of construction for the TRUWF to satisfy the requirements of 20.4.1 NMAC §270.15(a)(1) and (2) [10-01-03].

G.1.1. Container Storage Unit

The TRUWF will be capable of storing 105,875 gallons (gal) of waste. Figure 2-1 of this permit modification request provides a layout of the storage configuration and capacity for the TRUWF. The TRUWF will be made up of four general areas: the main staging and storage area; the characterization and certification area; the size reduction, decontamination, and repackaging area; and the shipping and receiving area. The following descriptions present each of the four areas.

G.1.1.1. Main Staging and Storage Area

The main staging and storage area will be the largest part of the TRUWF (Figure A-3 of this permit modification request). This area will serve as central storage for waste containers at the facility. From this area, containers may be transferred between the various other areas within the TRUWF and, potentially, to other LANL waste facilities as needed. Containers will be stored in this area between processes and before final shipment to off-site treatment or disposal facilities. The area will also be used to assemble and weigh containers as well as shrink-wrap drums prior to loading in the shipping area.

G.1.1.2. Characterization and Certification Area

A main function of the proposed TRUWF will be to characterize and certify all transuranic (TRU) waste and containers to meet Waste Isolation Pilot Plant (WIPP) WAC. Waste generators will provide characterization and records as required to meet the TRUWF WAC but the TRUWF will perform additional characterization and certification functions sufficient to ensure compliance with the WIPP WAC. These functions will be similar to those performed in the characterization trailers at TA-54 Area G Pad 10 and will involve the use of the same or similar trailer mounted characterization equipment. A trailer parking area will be located on the southern side outside the TRUWF to conduct characterization and certification activities (Figure A-3). This curbed and fenced area will have sufficient characterization capabilities to perform physical, radiological, and chemical content testing on TRU waste containers. Non-destructive testing (NDT) including real-time radiography (RTR), high efficiency neutron counter (HENC), and thermal equilibrium (TE)/ head space gas sampling (HSGS) will be performed in this area. Head space gas samples will be shipped off-site for analysis.

G.1.1.3. Size Reduction, Decontamination and Repackaging

The TRUWF will have the ability to repackage, size reduce, decontaminate, and treat waste in containers in a proper health and safety environment. These procedures will generally occur within this area of the facility. These activities are necessary under the WIPP Certification Program because a percentage of the waste containers' contents will have to be visually examined for certification or NDT may suggest anomalies that require inspection to identify noncompliant materials that must be removed. Quality assurance based sampling on a random basis will also require opening and visual examination of container contents. Any of these operational functions will require container opening, sorting, and repackaging capabilities. A small number of waste containers may be too large to ship as they are and will require size reduction. Container based treatment activities may also be necessary to prepare individual containers to meet off-site waste acceptance criteria (See Section G.2). Activities involving treatment, repackaging, and size reduction may require glove bags, modular panelized containment systems, and special heating, ventilating, and air conditioning (HVAC)/ high-efficiency particulate air (HEPA) equipment. In some cases, some of these operations may occur within other areas of the facility if using proper portable anti-contamination equipment in addition to those which occur in this portion of the facility.

G.1.1.4. Shipping and Truck Staging Area

The shipping and truck staging area will be located within the western part of the TRUWF as well as on the asphalt area outside. The TRUWF will receive and load waste containers and prepare the certification paperwork and transport documentation required for shipment off-site. In the case of mixed transuranic waste shipped to WIPP, this area will receive empty Transuranic Waste Package Transporter (TRUPACT) II containers, load them with WIPP certified waste containers, and prepare the documentation for transport. A 10 ton bridge crane will be present to hoist and load container assemblies into waste containers. The outside truck staging area will be used to temporarily store waste transport trucks as required for shipping schedules or contingencies.

G.1.1.5. Facility Layout and Construction

The main storage area and the indoor portion of shipping and receiving operations will be within a pre-engineered metal building. The characterization trailer parking area will be outside the main storage area on the southern side of the building. The design concept for the areas where sealed waste containers are handled (the main storage area, the indoor shipping and receiving operations area, and the trailer parking area), will be about 23,000-sf of floor space. These operations will not have special HVAC equipment because the Type A waste containers and standard waste boxes (SWBs) will provide adequate confinement for storage operations. The waste containers will be stored with adequate aisle space and may be stacked as outlined in Section 2.3 of this permit modification submittal. The outdoor characterization and certification area, on the southern side of the building will consist of a fenced and curbed area where characterization trailers will be parked to perform physical, radiological, and chemical content testing on TRU waste containers. The western portion of the outdoor storage area will be utilized for loaded waste truck parking, truck turn around, and receiving. Waste trucks will be parked in the paved area on the southwestern side of the TRUWF if a shipment of waste is delayed for departure after loading or other scheduling problems develop.

The metal building containing the main storage area and indoor shipping and receiving operations will be a pre-engineered structure constructed of a steel frame, steel wall/roof panels, with a concrete floor (sealed with a protective coating). Interior partitions will be concrete masonry unit block and drywall on metal studs. The building will be HEPA filtered and have monitoring systems to alert operations to contamination, but will not have special HVAC equipment engineered into the building. The overall features are meant to facilitate easy decontamination should a leak occur, and to prevent the spread of contamination to the environment.

The eastern portion of the facility will be a concrete containment building for treatment, size reduction, decontamination, and packaging operations and will be approximately 5000-sf. This area will include operations that open waste containers, sort and manipulate contents, and conduct all treatment activities as outlined in Section G.2. Operations in this area will pose a risk of release of radiological materials to the environment and workers resulting from a spill or other upset. Thus, the area will be provided with a nuclear safety qualified structure, fire suppression, and confinement HEPA ventilation systems. The structure will be constructed of reinforced concrete and contain a modular, steel and plastic panelized containment system to facilitate safe handling of the waste. Within the containment system, separate confinements (such as glove boxes, glove bags, and tents) will be constructed (during operations) where waste packages will be opened and the wastes will be sorted, treated, disassembled, sized reduced, decontaminated, and repackaged. This area will be HEPA filtered and also contain various monitoring systems.

G.1.2. Container Handling and Inspection [20.4.1 NMAC §§ 264.171, 264.173, and 264.174]

Handling and inspection requirements for containers stored within the TRUWF container storage/treatment unit are presented in Sections 2.5 and 2.7 respectively, of this permit modification submittal. This information is provided to meet the requirements of 20.4.1 NMAC §§ 264.171, 264.173, and 264.174 [10-01-03].

G.2. TREATMENT IN CONTAINERS

The information provided in this section is submitted to address the applicable treatment processes that will occur in the TRUWF for containerized waste. The TRUWF will accept waste containers from generators across the LANL site. These containerized wastes will be characterized and accepted at the TRUWF using generator knowledge of the waste and may be packaged in generator supplied containers. In some cases, the waste may need further management to meet the WAC for off-site facilities, to resolve waste item discrepancies, or to prepare waste and containers for acceptable transport. This may involve the use of relatively small scale treatment activities to be performed at the TRUWF. These treatment activities will typically be limited to individual waste items or only a portion of the waste contents in a container.

Treatment methods that will be used at the TRUWF may include absorption, neutralization, cementing or grouting, and puncturing of aerosol cans. The most common treatment method that is anticipated is absorption of liquids. These methods of treatment will be conducted at the TRUWF within waste containers and may be performed individually and in conjunction with each other to treat the waste in the most effective manner possible to meet off-site waste acceptance criteria. When more than one treatment will be performed on a waste, individual operations, as outlined below, may be combined. Treated waste may be consolidated with other treated waste provided that the wastes are compatible. These treatment processes may also be conducted during waste repackaging and/or resizing operations. All treatment will be conducted with the use of a glove bag, tent, and/or in the modular panelized containment system to provide containment. HVAC/HEPA equipment will also be used as necessary for containment purposes.

G.2.1. Absorption

The treatment objective of absorption will be to use a suitable absorbent material to absorb any free liquid waste in order to meet the WAC for the off-site facility. Prior to absorption, the compatibility of the liquid with absorbent being used will be addressed and documented, as required. Absorbent materials will also be checked for compatibility with waste types based on process knowledge and stored accordingly. The volume of liquid waste to be treated and amount of appropriate absorbent [selected based upon visual examination, process knowledge, acceptable knowledge, or other appropriate means (e.g., water miscibility)] will be estimated. The absorption/treatment processes are generally described below.

If treatment will be occurring for liquids that will not be removed from the original storage container, absorbent will be added directly to the container and the container will then be closed. If the free liquid will be transferred from the original container and placed in a second container, absorbent will be added to the second container either prior to or after the liquid waste is added to the container. A sufficient volume of free liquid will be removed so that the free liquid remaining in the original container can be treated through the addition of absorbent or will not need further treatment.

In some cases drum liners or other smaller containers located within the original waste container will have to be removed from the original container prior to treatment (e.g., condensate between the liner and the container). The addition of the absorbent will occur by placing it into the drum liner or the small container and then repackaging the liner or container into the original container or a new waste container.

Transfer of liquids will primarily be through the use of equipment (e.g., disposable pipettes, pumps, ladles, drip pans, etc.) or pouring to remove the liquid from the original container into another container. Waste transfer or adding absorbent to liners or small containers will occur in a drip pan or other type of secondary containment device. Standardized and approved procedures will be used to minimize the spread of hazardous waste components during waste transfer, removal of waste, or waste treatment. When absorbent is added to a container, the absorbent and waste may be mixed, if required. Any free liquid remaining in the original container will be treated via absorption, cementation, and/or neutralization as necessary. Treated waste will be visually inspected for signs of free liquids. If no free liquids are present, the treatment will be considered successful. If the absorption is not fully effective, the cause of the process failure will be evaluated. If insufficient absorbent was used, the process may be repeated with additional absorbent.

G.2.2. Neutralization

The treatment objective of neutralization will be to adjust the pH of liquid waste to a desired range for absorption or cementation. The desired pH, which depends on the waste type and determines the specific absorption agent(s) to be used, will be established prior to conducting treatment. The weight or volume of the waste will be determined and recorded and a pH measurement will be taken. The appropriate types and amounts of neutralizing agents will be weighed/measured out and added. The primary acidic neutralizing agents will include acids, such as citric acid. The primary basic neutralizing agents will include bases, such as calcium carbonate. The treatment agents and waste will be mixed according to the method and duration specified in the operating instruction. A pH measurement will be taken to verify results against the pH end-point established as specified in the operating instruction and to confirm treatment effectiveness. If the neutralization is not effective, the cause of the process failure shall be evaluated. If insufficient reagents were used, the process may be repeated with additional reagents. Once neutralized, the liquid may be mixed with appropriate absorbents or cemented, unless the neutralizing agent is also an absorbent.

G.2.3. Cementation

The treatment objective of cementation will be to solidify a waste stream through the process of mixing the waste with cement or a cement material. In some cases, cement may be added to a previously cemented waste if the waste matrix has released liquids. Cementation may be performed within the original container or liquid/sludge waste may be transferred to another container where cement and other supplemental cementitious materials are added. The mixture of waste and cement material will be blended using a drum mixing unit or other approved method to create a grout. The grout solidification matrix that is formed will be allowed to cure for a sufficient period of time within a closed container and then prepared for shipment to an off-site facility for further treatment or disposal. The inert material that will generally be used will be Portland cement. Some waste containers may require that absorbent be added to the waste container prior to the addition of cement to provide a drier matrix and allow identification of the proper combination of ingredients to ensure a successful stabilization effort.

G.2.4. Can Puncture

The treatment objective of aerosol can puncturing will be to remove the potential for reactivity of the aerosol can and render it non-hazardous. Occasionally during RTR scans or visual examination, an aerosol can will be found within a waste container. The aerosol can will be removed and punctured using a waste puncturing system that will capture any liquids released from the punctured can as described below. The can will then be placed into the waste container that it was removed from or a new container. The resulting liquids will be captured within the puncturing system and will be consolidated with other liquids from the same puncturing process or other treated wastes at the TRUWF. The following presents the general steps that will be used in puncturing aerosol cans:

- Absorbent will be placed into the drum containing the puncturing unit prior to use.
- The puncturing unit will be threaded directly onto a drum where aerosol cans will be punctured.
- The can will be placed into the unit and will be punctured per manufacturer's specification.
- The resultant liquid will be collected within the drum and may be commingled with other compatible liquids resulting from the puncturing process.
- The punctured can will be removed from the puncturing unit when it has been given enough time to drain of liquids.
- The punctured can will be placed within the original waste drum or a new drum.
- Additional absorbent may be placed into the drum containing liquids from the puncturing unit to ensure that there are no free liquids present.
- Absorbed liquids from the puncturing process may be commingled with absorbed liquids from other treatment processes at the TRUFW, provided that the wastes are compatible.
- The drum will then be prepared for shipment to an off-site facility.

G.3. SECURITY AND ACCESS CONTROL AT TRANSURANIC WASTE FACILITY [20.4.1 NMAC §270.14(B)(4) AND §270.14(B)(19)(VIII) AND 20.4.1 NMAC §264.14]

The hazardous waste management unit at TA-52, Building 190 will be provided security by both its location on the mesa north of Puye Road and because the facility will be contained within a security fenced area with gates. Security within the facility will be provided by a system of facility access controls (badge readers and administrative controls) to ensure that only authorized personnel are granted access. These access controls will also ensure that all facility personnel can be identified and located in an emergency. Guard stations will control public access on Pajarito Road east and west of TA-52. Therefore, only properly identified LANL and Department of Energy employees authorized to enter the facility or individuals under their escort will have access to the TRUWF.

Any access to the TRUWF will be limited by an access control station where check-in or badge-in will be required prior to entrance. The security fence will be at least 8 feet (ft) high and be a chain link type fence with steel pipe fence posts. Fence tops will have at least three strands of barbed wire angled away from the protected area to prevent a person from scaling the fence. At least two vehicle access gates will be integrated into the fence line. These gates, when opened, shall provide at least a 16 foot wide clearance to enable vehicle access. Gates will be locked when the facility is not operational.
TA-52 will be patrolled by LANL security personnel during both operational and non-operational hours to ensure that the gates are locked and that unauthorized entry does not occur. In accordance with 20.4.1 NMAC §270.14(b)(19)(viii) [10-01-03], the proposed locations of the security fences, entry gates, and entry stations are shown on Figure G-1. In addition to the fence and entry gates, cliffs and canyons on the northern side of TA-52 will provide natural barriers to discourage unauthorized entry.

Warning signs stating "Danger – Unauthorized Personnel Keep Out," will be posted on the perimeter fences at approximately 40 to 110- foot intervals and will be able to be seen from any approach to TA-52. The legends on the signs will be bilingual (i.e., English and Spanish) and will also indicate "No Trespassing by Order of the United States Department of Energy." The signs will be legible from a distance of 25 feet. Signs for any confined areas, if necessary, may be reduced in size, but will be legible to personnel who require access to these areas.

G.4. PREPAREDNESS AND PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C]

The following sections present waste management techniques that will be used at TA-52 to comply with the preparedness and prevention requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C [10-01-03]. Additional information on the communication and alarm equipment available at LANL is presented in Appendix E of this submittal and in the LANL permit renewal documentation. A list of the emergency equipment available for use at the hazardous waste management unit at the TRUWF is provided in Tables E-2 and E-3 of Appendix E of this document. The TRUWF will be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, in accordance with 20.4.1 NMAC § 264.31.

G.4.1. Required Equipment [20.4.1 NMAC §264.32]

The TRUWF will be equipped with multiple audible and visual safety-alarm systems to alert personnel in the event of an emergency and to evacuate the area. These alarm systems will be located both inside and outside the facility and will be monitored and controlled by the facility monitor/control system. The facility monitor/control system will be in operation 24 hours a day and will be located in the access control station at the TRUWF. Specific facility monitor/control system equipment to be located at the TRUWF is discussed below.

Emergency equipment will be located throughout the TRUWF and will include internal communications, alarm systems, fire alarms, spill kits, and decontamination equipment. Detailed information on the required emergency and safety equipment located at the TRUWF is provided below. For additional information on equipment that will be located at the TRUWF, see Table E-3 in Appendix

E of this permit modification application. Water flow, valve tamper switches, manual pull stations, smoke detection and trouble signals will all be monitored.

Fire-alarm pull boxes and/or drop box push-button alarms will be located pursuant to National Fire Protection Association (NFPA) standards in the TRUWF where waste management activities will be conducted. Fire-alarm pull boxes may be used by personnel to activate a local fire alarm when a fire or other emergency is discovered. Once manually activated, an alarm will sound in the TRUWF access control station and at the Los Alamos County Fire Department (LACFD).

The TRUWF will be equipped with fire-suppression alarm systems and/or smoke detectors. The fire-suppression alarms will be activated when water flow is detected in the sprinkler pipes of the fire-suppression system. The smoke detectors, once activated, also sound an alarm. Upon activation of the fire-alarm system, an alarm will sound and red lights will flash to alert personnel of emergency conditions. All fire-alarm pull boxes, heat and smoke detection systems, and automatic fire-suppression systems that will be located at the TRUWF will be connected to the LACFD through LANL's Central Alarm Station (CAS).

A general evacuation alarm will also be present at the TRUWF for other emergencies requiring evacuation. In addition to the alarms described above, a public address (PA) system may also be used to announce an evacuation at the TRUWF. The PA system will be able to be heard throughout the TRUWF and will be activated by the access control station.

Continuous air monitors (CAM) will be located at various locations throughout the TRUWF. CAMs will be used as additional leak detection for the waste management unit addressed in this permit application by detecting any airborne alpha contamination that would be present if a spill or leak of mixed waste were to occur. Fixed head monitors and personnel monitors may also be used to detect contamination.

TA-52, Building 190 will be equipped with both local paging and conventional telephones to provide adequate communication and to summon external emergency assistance, if necessary. Local paging telephones and speakers and/or conventional telephones will be located at or near the hazardous waste management unit addressed in this permit application. Local paging telephones will be used to page on-site personnel within the local paging area and may be used in the event of an emergency to communicate the location and nature of hazardous conditions to personnel in the area. Personnel working within any area of the TRUWF will also have the ability to use conventional telephones or cellular telephones to call the access control station to summon emergency assistance from the Emergency Management and Response Office, local police and fire departments, and state emergency response teams, if necessary.

Fire control equipment will be readily available for the waste management unit addressed in this permit application. Depending on the size of the fire and the fuel source, portable fire extinguishers will be available and may be used by trained on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. The TRUWF will be equipped with heat and smoke detection systems and/or automatic, heat-activated fire-suppression systems to aid in the timely response in the event of fires in the TRUWF.

Fire hydrants are located in accordance with NFPA standards. Water will be supplied to the fire hydrants by a municipal water system which will provide adequate volume and pressure (i.e., greater than 1,000 gal per minute and 90 pounds per square inch static pressure) to multiple water hoses in the event of a fire. The LACFD will supply all water hoses needed in the event of a fire at the TRUWF.

There will be several spill kits available at the TRUWF to mitigate containable spills. These kits will typically contain sorbents, neutralizers, personal protective equipment (PPE), and other equipment essential for containment of spills. Trained personnel will use the spill kits only if they know what has been spilled and they are sure their actions will not put themselves or others at risk. In addition to the spill kits, shovels for cleanup will be available at the TRUWF. Oversized drums and sorbents will also be stored at various locations throughout the TRUWF. Emergency personnel will provide additional spill control equipment and assistance upon request depending on the size and severity of the spill.

Personnel decontamination equipment that will be available at the TRUWF will include safety showers and eye wash stations located inside and outside the TRUWF. Additional decontamination equipment may be provided by emergency personnel. Material safety data sheets will be available at operations areas and will provide useful exposure information.

G.4.2. Testing and Maintenance of Equipment [20.4.1 NMAC §264.33]

All communications and alarm systems, fire protection, and decontamination equipment at TRUWF will be inspected, tested, and/or maintained as provided according to the inspection schedule detailed in

Appendix C of this permit modification submittal. The frequency of inspection will be adequate to ensure proper operation in the event of an emergency. Maintenance, repair and replacement of emergency equipment will be performed as required.

G.4.3. Access to Communications or Alarm Systems [20.4.1 NMAC §264.34]

Whenever waste is being handled in the TRUWF hazardous waste management unit, all personnel involved will have immediate access to an internal alarm or emergency communication devices, either directly or through visual or voice contact with another individual. These devices will include fire alarms, evacuation alarms, paging telephones, radios, and cellular telephones. In the event of an emergency, communication equipment at the TRUWF will allow personnel to contact the access control station, the operating group management, HAZMAT personnel, and/or the CAS operator. In addition to communications and alarm systems, the TRUWF personnel may carry pagers so that they can be contacted by the access control station and other LANL emergency support personnel at all times.

G.4.4. Aisle Space Requirements [20.4.1 NMAC §264.35]

Waste containers in the TRUWF storage units will be arranged in rows with a minimum aisle space of 24 inches (in.). Storage configuration within a row will depend upon the type of container, its size, and its weight restrictions. Fifty-five-gal. drums and larger containers will be arranged in rows on pallets and may be stacked to a maximum of three containers high, unless size and weight restrictions prohibit stacking due to safety concerns. Smaller containers will be stacked to a maximum of ten ft high.

G.4.5. Support Agreements with Outside Agencies [20.4.1 NMAC §264.37(a)]

LANL maintains support agreements with outside agencies for emergency response assistance. Information regarding these support agreements is provided in the most recent General Part B Permit Application (LANL, 2003).

G.5. HAZARDS PREVENTION [20.4.1 NMAC, SUBPART V, PART 264, SUBPART C; 20.4.1 NMAC §270.14(B)(8)]

A description of the preventive procedures, structures, and equipment that will be located at the TRUWF is presented below. This information is provided in accordance with the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart C, and 20.4.1 NMAC §270.14(b)(8) [10-01-03].

Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards, undue exposure of personnel to hazardous and mixed waste, and releases to the environment.

G.5.1. Preventing Hazards in Unloading [20.4.1 NMAC §270.14(b)(8)(i)]

Flatbed trucks, trailers, forklifts, or other appropriate vehicles may be used to transport waste containers to and from the waste management unit at the TRUWF. Forklift operators may use a boom, if necessary, to improve handling capabilities. Small containers may be handled manually or with a dolly. The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while moving containers.

G.5.2. Preventing Runoff [20.4.1 NMAC §270.14(b)(8)(ii)]

Runoff from the indoor waste management unit at the TRUWF to other areas of the facility or to the environment will be prevented. Secondary containment will be provided where potential liquid-bearing containers are stored. Secondary containment systems (e.g. pallets) will be utilized, as needed, and will have sufficient capacity to contain at least 10 percent (%) of the volume of potential liquid-bearing containers or the volume of the largest container stored in the system, whichever is greater, pursuant to the requirements of 20.4.1 NMAC §264.175(b)(3) [10-01-03]. Runoff control of liquids resulting from fire-suppression activities and from leaks or spills will be accomplished by using a vacuum truck, a portable pump, a HEPA vacuum, and/or sorbents, depending on the volume and location of accumulated liquid. Accumulated liquids will be removed or managed as soon as necessary to prevent overflow of the collection system. For leaks and spills, liquid volumes should be sufficiently controlled through the use of secondary containment systems as described above to prevent run-off from the facility. In the event of potentially large amounts of run-off liquids from fire suppression activities, the building fire water collection system and outside fire water collection tank will be designed in accordance with NFPA and U.S. Department of Energy standards.

The outside characterization trailers will provide for waste storage in built-in secondary containment or secondary containment pallets during characterization activities and thus, any waste spills or leaks will be contained within the trailers. Waste stored in the outside shipping and truck staging area will be protected within covered secondary containment pallets or in shipping containers. All containers of waste that will be stored within the outdoor shipping area will be covered by a canopy or tarp to prevent contact with precipitation. Loaded TRUPACT II containers or waste trucks may also be stored in the outdoor shipping area until shipment to the off-site facility occurs. TRUPACT II containers are leak-resistant containers with an acceptable leak rate of 2.6 x 10^{-7} cubic centimeters of helium per second, which prevents the containerized waste within the TRUPACT II containers from contact with precipitation. Any leaks or spills which escape this containment will be mitigated as soon as possible in accordance with the facility's inspection and contingency plan. Run-off from precipitation or fire suppression activities from these two outside areas will be collected by a central drain and directed to a storm water sampling station.

G.5.3. Preventing Water Supply Contamination [20.4.1 NMAC §270.14(b)(8)(iii)]

The waste management unit at the TRUWF will be located, designed, constructed, operated, and maintained in a manner that will ensure the prevention of water supply contamination. The unit will be located mostly inside the building and outside storage of liquids will occur only with secondary containment. In the event of a release, the materials in question will be removed as quickly as possible and packaged in an appropriate container. Given these conditions, there is little or no potential for deposition or migration of waste constituents into the groundwater or other water supplies as a result of waste-handling operations that will occur at the TRUWF. In addition, the depth to groundwater at the nearby TA-55 is approximately 1,200 ft (LANL, 1998) and the average annual precipitation in the Los Alamos area (including both rain and water equivalent or frozen precipitation) is 48 centimeters (cm). The evaporation of freestanding water exceeds the annual precipitation. Permeability rates for soils at TA-55 range from 1.5 to 5.0 cm per hour (cm/hr) in the top layers to 0.15 to 5.0 cm/hr in the lower layers. Available water-holding capacity ranges from 0.14 to 0.21 percent (Nyhan et al., 1978). Collectively, the depth to the regional aquifer and the annual moisture deficit significantly limit the potential for contaminants to migrate to the groundwater in the unlikely event that contaminants reach the permeable ground surface surrounding the TRUWF. In addition, all water supply lines to the TRUWF will be under pressure and will be equipped with backflow prevention devices. Pursuant to the requirements of 20.4.1 NMAC §270.14(b)(8)(iii) [10-01-03], no impact to water supplies is expected.

G.5.4. Mitigating Effects of Power Outages [20.4.1 NMAC §270.14(b)(8)(iv)]

Electrical power will be supplied at the TRUWF to operate ventilation systems, the PA system, various instruments, and other electrical equipment. In the event of a power failure, portable generators will be available. These generators may be used as temporary power sources at the waste management unit at the TRUWF. Evacuation alarms, equipped with a battery backup, will be located throughout the TRUWF and will continue to operate for eight hours during a power failure. Operations at the waste management unit will be discontinued temporarily if electrical power is not restored quickly or if container-handling equipment fails. Neither a power nor an equipment failure would affect containment at the TRUWF waste management unit.

The facility will have a standby generator that will provide power to the necessary equipment to put the facility into a safe mode in the event of a power outage. Systems attached to the generator include the breathing air skid, HEPA filtration systems, exhaust fans, any modular paneled containment system, lighting, fire alarm system, area alarms, and freeze protection for the fire water skids.

G.5.5. Preventing Undue Exposure [20.4.1 NMAC §270.14(b)(8)(v)]

To prevent undue exposure of personnel to hazardous or mixed waste, personal protective equipment appropriate for the waste being handled will be worn by all on-site personnel at the TRUWF involved in waste management activities. Workers involved in waste handling at the TRUWF will be required to wear protective work uniforms and steel-toed/composite-toed shoes, as appropriate. Hard hats and gloves may also be worn while equipment is being operated and when containers are being loaded or unloaded. The different levels of PPE are defined by the Occupational Safety and Health Administration as follows:

- *Level D*: Coveralls; safety boots; safety glasses or goggles; hard hat; and appropriate gloves
- *Level C*: Full-face, air-purifying respirator with appropriate cartridges for the chemicals or hazards present; chemical-resistant suits; chemical-resistant safety boots or booties; and inner and outer gloves
- *Level B*: All Level C equipment plus self-contained breathing apparatus in place of a Level C full-face respirator
- *Level A*: All Level B equipment, plus a fully-encapsulating chemical-resistant suit.

Most waste-handling operations at the TRUWF container storage/treatment unit will require that personnel handling wastes or working in the unit will wear modified Level D PPE, (safety glasses and hard hats are not always required depending on the associated work hazards identified in job-specific hazard control plans). Modified Level D may include any item in Level D. There are instances where an increased level of PPE is required, such as during treatment activities, an emergency, or an unusual hazardous situation. If a situation arises during an emergency and an increased level of PPE is required, the PPE will be compatible with the wastes present. All personnel that use PPE are trained and qualified to use the equipment properly.

All personnel involved in waste-handling operations in the TRUWF will be required to have training appropriate for their work. Training requirements are presented in Appendix D of this permit modification submittal. Personnel will also be required to review job hazards prior to performing waste-handling activities. Sampling plans, hazard control plans (which address monitoring equipment), and work authorizations will be required, in accordance with LANL safety procedures. Personal monitoring equipment will be established using the job hazard review process. Together, the required training, plans, and work authorizations will help to prevent undue exposure to personnel.

G.5.6. Preventing Releases to the Atmosphere [20.4.1 NMAC §270.14(b)(8)(vi)]

Releases to the atmosphere are not anticipated from the TRUWF container storage/treatment unit addressed in this permit modification submittal. Containers will be kept closed during handling and storage except when, upon inspection, it is determined that a container currently in storage needs to be over packed or repackaged in a new container, or during waste characterization, waste treatment, or verification activities or when it is necessary to add or remove waste. Inspections will be conducted to ensure the integrity of all stored containers as described in Appendix C of this document.

Treatment and repackaging operations will be contained in pre-engineered metal or plastic structures to provide containment. An external secondary confinement structure will surround the internal primary confinement structure. Both primary and secondary confinement structures will be equipped with an air filtration system that includes a HEPA ventilation system that will prevent the release of particulates to the environment.

Waste characterization trailers that will be located in the southern portion of the TRUWF container storage/treatment unit will include glove boxes and hoods for managing waste. The waste characterization facilities transportainers will provide external confinement for those operations. The equipment and the transportainers will have HEPA filtration systems to contain potential releases.

Mixed transuranic waste containers will be vented with one or more filters to allow any gases that are generated by radiolytic and microbial processes within a waste container to escape, thereby preventing over pressurization within the container. The HEPA-grade vent filters will prevent the escape of any radioactive particulates. A ventilation alarm system and/or other air monitoring equipment will be located in the vicinity of waste management activities located in the TRUWF. In the event of an unexpected release, all personnel working within or near the area will be notified immediately to evacuate.

The facility will have an active HEPA filtration system to control potential releases to the atmosphere. The ventilation technique used to prevent accidental contamination releases from the building will be to maintain a negative pressure. This will be achieved by providing exhaust ventilation only or to exhaust more air (approximately 5%) than is being supplied where air conditioning is required. In both instances, leakage through the building envelope is maintained inward by the negative pressure and all air leaving the building envelope is treated prior to release, typically with a HEPA filter train. To prevent releases when doors are opened, airlocks are provided at each entrance to the building and between various sections of the building (i.e.; between the main storage area, the shipping area, and the treatment/repackaging/size-reduction area). These airlocks are constructed by building a room at the entry door. Besides the entry door located on the exterior wall of the building, a second door from the room leads into the building interior. These doors are interlocked to ensure that both doors cannot be opened simultaneously which, in conjunction with the negative pressure in the building, prevents potential releases when a door is opened.
The air leakage around the door cracks is also accounted for in the design of airlocks. To ensure the ventilation system adjusts to changes in leakage rates, a variable frequency drive will be used on the exhaust fans. The drive will increase the speed of the fan if the negative pressure in the building rises above the appropriate set point which maintains the required face velocity at openings to prevent release of contaminants.

G.6. CONTAINMENT SYSTEMS [20.4.1 NMAC §§270.15(A)(1-5) AND 270.15(B)(1-2)]

Liquid that might accumulate at the TRUWF container storage/treatment unit will be contained within a secondary containment system such as a secondary containment pallet until the liquid is removed. All secondary containment systems are designed to contain at least 10% of the volume of potential liquid-bearing waste containers or the volume of the largest container, whichever is greater, pursuant to the requirements of 20.4.1 NMAC § 264.175(b)(3) [10-01-03]. Any accumulated liquids are removed in as timely a manner as is necessary to prevent overflow of the collection system, pursuant to 20.4.1 NMAC § 264.175(b)(5). Any accumulated liquids are removed with a vacuum truck, a HEPA vacuum, a portable pump, or by other means, as appropriate and depending on the waste type and volume. The collected liquids are then transferred to appropriate containers and characterized. If the accumulated liquids are from an identified source or from precipitation, snowmelt, or water generated during fire-suppression activities, the resulting material will be characterized as a newly-generated waste using acceptable knowledge or will be analyzed, as applicable, for the hazardous waste constituents known to be components of the source. If the accumulated liquids are from an unidentified source, the resulting material will be analyzed for the appropriate potential parameters listed in Table E-4 of Appendix E in this permit modification request package. Containers of collected liquids will be stored with secondary containment, pending analytical results that determine how the liquids will be managed. This method of removal and analysis of accumulated liquids fulfills the requirements of 20.4.1 NMAC § 270.15(a)(5) [10-01-03], for prevention of overflow.

Secondary containment at the TRUWF container storage/treatment unit will primarily be provided by self-containment pallets, covered self-containment pallets, or single-drum pallets. Each containment system is described below.

- Self-Containment Pallet: Molded high-density polyethylene base with a fiberglass grating that elevates the containers over a reservoir that is capable of containing leaks and spills from the containers.
- Covered Self-Containment Pallet: Molded, chemical-resistant, high density polyethylene with a removable polyethylene grating and a hinged two-part cover, which is impervious to precipitation. Supplement G-1 provides detailed information on the covered self-containment pallets.
- Single-Drum Containment Pallet: An 85-gal container made of heavy-duty polyethylene designed to hold one 55-gal drum.

Containers holding hazardous waste in the storage/treatment unit will be protected from potential contact with accumulated liquids by either being elevated or stored in an area that is designed and operated to remove accumulated liquids. Drummed waste containers are placed on pallets or stored in self-containment structures. Standard waste boxes may be placed on pallets. Large waste boxes are typically elevated by design. All waste items in TRUWF will either be placed on pallets, elevated with blocks, or are elevated by design.

G.7. SPECIAL REQUIREMENTS FOR IGNITIBLE, REACTIVE, AND INCOMPATIBLE WASTES [20.4.1 NMAC §§ 264.17(A) AND (B), 264.176, AND 264.177(A),(B), AND (C); 20.4.1 NMAC §§ 270.14(B)(9) AND 270.15(D)]

Containers holding ignitable or reactive wastes will be located at least 50 ft from the LANL property line at all times and will be protected from sources of ignition or reaction. The distance to the nearest facility boundary is approximately 2,500 ft. Waste management practices at the TRUWF container storage/treatment unit will minimize the possibility of accidental ignition. There will be no sources of open flames allowed within the unit. Cutting and welding activities will not be conducted in the vicinity of waste containers. Ignitable and reactive wastes will be segregated and separated by distance to minimize the possibility of spontaneous ignition and will be stored inside the building to minimize exposure to hot surfaces and radiant heat. Only non-sparking tools are used in handling ignitable waste containers, and lightning protection will be installed for the building. Smoking will not be allowed in the TRUWF. “No Smoking” signs will be conspicuously placed wherever there is a potential hazard from ignitable or reactive waste, as required by 20.4.1 NMAC § 264.17(a) [10-01-03]. Precautions will be taken to prevent reactions that may generate extreme heat or pressure, fire or explosions, or violent reactions and to prevent reactions that may damage the structural integrity of the TRUWF including segregating and separating (by distance) ignitable and reactive wastes that will be stored in the building. Precautions will be taken to prevent reactions that may produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment, or produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions including keeping containers closed during storage and venting containers of mixed transuranic waste. Together, these measures will meet the requirements of 20.4.1 NMAC §§ 264.17(a) and (b) and 264.176 [10-01-03].

Incompatible wastes will be segregated and separated during storage in accordance with 20.4.1 NMAC § 264.177(c) [10-01-03]. All waste will be segregated and stored in accordance with DOT compatibility groups. These DOT compatibility groups are: flammables (Class 3), oxidizers (Class 5.1), combustible and noncombustible miscellaneous hazardous material (Class 9), corrosives (Class 8), poisons (Class 6), radioactive (Class 7), acids (Class 8), reactives (Class 4), and non-regulated materials. Incompatible wastes will be separated and segregated from other wastes and materials by means of a berm, dike, wall, or other specific means (e.g., secondary containment pallets, modular sheds, distance). In addition, no incompatible wastes will be mixed, and no waste will be placed in a container that previously held an incompatible waste, as required by 20.4.1 NMAC §§ 264.177(a) and (b), and 20.4.1 NMAC § 270.15(d) [10-01-03].

G.8. AIR EMISSION STANDARDS FOR CONTAINERS

The hazardous wastes that will be stored in containers at the TRUWF may be subject to 20.4.1.500 NMAC (incorporating the Code of Federal Regulations [CFR], Title 40, Part 264, Subpart CC, “Air

Emission Standards for Tanks, Surface Impoundments, and Containers") based on the applicability criteria specified in 40 CFR § 264.1080. Subpart CC standards for containers, as currently set forth by the U.S. Environmental Protection Agency, require that containers of hazardous waste be covered so that there are no detectable emissions of volatile organic compounds to the air. Inspection and monitoring requirements are also specified.

As indicated in 40 CFR § 264.1080(b)(6), these standards are not currently applicable to containers that are used solely for management of radioactive mixed waste in accordance with all regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act. The standards are also not applicable to containers of hazardous waste with less than 500 parts per million by weight (ppmw) volatile organics, containers of less than 0.1 cubic meters (m^3) (approximately 26 gal) capacity, or that have received waste prior to the effective date of the regulation (December 6, 1996). The following management standards apply for hazardous wastes managed at LANL that do not meet any of the exemptions listed in 40 CFR §264.1080(b).

Generator information will be used to determine whether the concentration of volatile organics in a waste stream at the point of generation is less than 500 ppmw, or is equal to or greater than 500 ppmw, which is the threshold concentration for Subpart CC requirements. In the event that this information is not available, the waste will be characterized in accordance with Appendix B of this permit modification submittal prior to being received at the TRUWF. Any hazardous waste that is newly-generated through the treatment or re-characterization of waste at the TRUWF will be characterized for the volatile organic content in accordance with Appendix B of this permit modification request submittal.

Three levels of air emission controls based on container design capacity are established in 40 CFR § 264.1086(b). The TRUWF hazardous waste storage procedures will require Level 1 controls based upon container design capacities. Containers of greater than 0.1 m^3 and less than 0.46 m^3 (approximately 119 gal.) capacity and that meet U.S. Department of Transportation (DOT) specifications under 49 CFR, Part 178, will be kept closed during storage pursuant to 40 CFR § 264.1086(c)(3). Containers undergoing waste characterization activities may be opened for access for the purposes described in 40 CFR § 264.1086(c)(3). As required by 40 CFR § 264.1086(c)(4), these containers are subject to a visual inspection and monitoring program. On or before acceptance of the waste container at the TRUWF, the container will be inspected to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position, in accordance with 40 CFR § 264.1086(c)(1)(ii). This inspection will be documented in uniform hazardous waste manifests. Pursuant to the Inspection Plan in Appendix C of this permit modification submittal, containers will be inspected at least weekly at the TRUWF to ensure that the containers remain closed during storage, thereby exceeding the requirements of 40 CFR § 264.1086(c)(4)(ii).

G.9. RECORDKEEPING REQUIREMENTS

Recordkeeping requirements applicable to the container storage/treatment unit at the TRUWF, will consist of the biennial report, unmanifested waste report, and additional reports. These reports are discussed in the most recent version of the LANL General Part B Permit Renewal Application (LANL, 2003).

G.10. REFERENCES

LANL, 1998, "Hydrogeologic Workplan," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

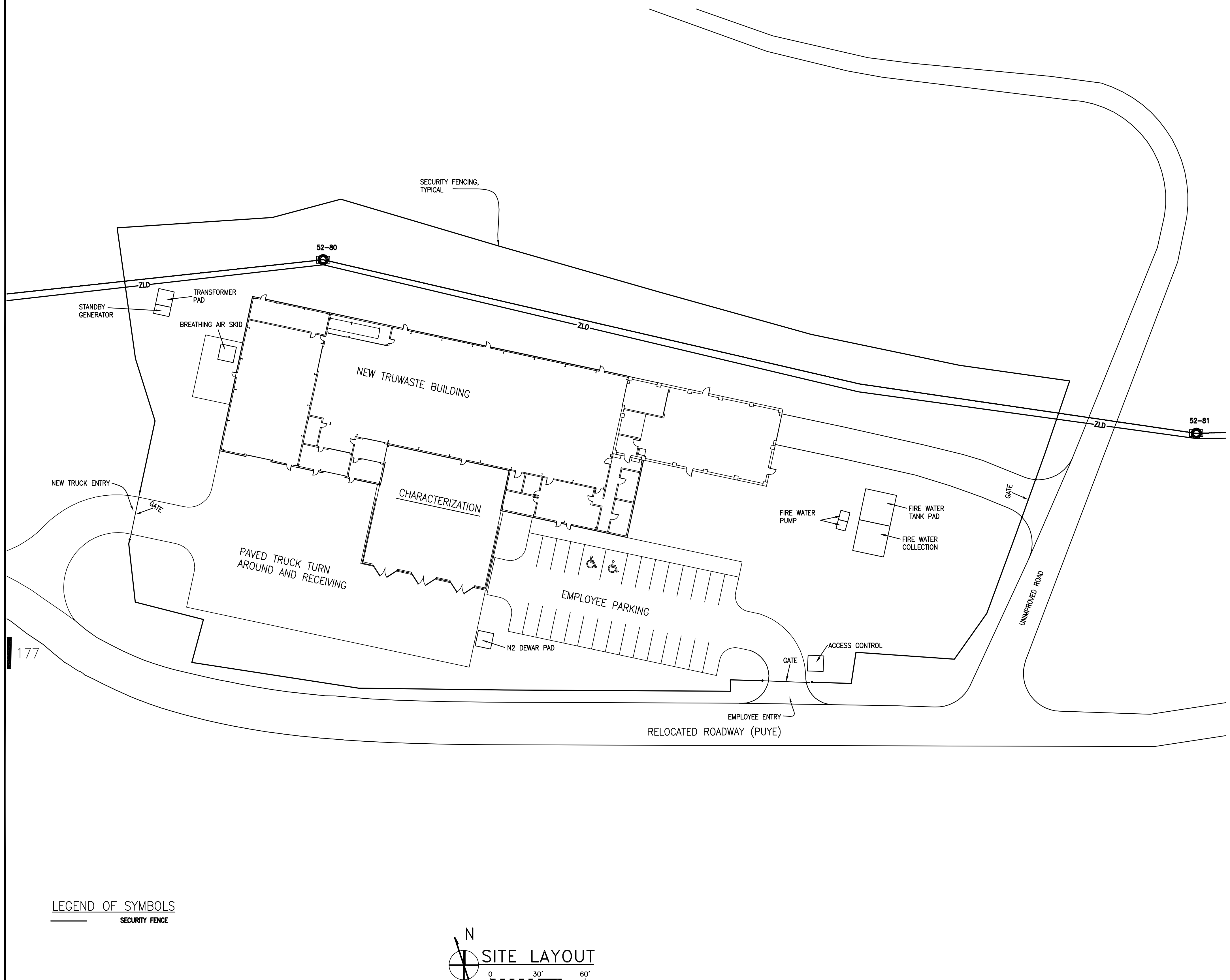
LANL, 2003, "Los Alamos National Laboratory General Part B Permit Renewal Application, Revision 2.0," LA-UR-03-5923, August 2003, Los Alamos National Laboratory, Los Alamos New Mexico.

Nyhan, J.W., L.W. Hacker, T.E. Calhoun, and D.L. Young, 1978, "Soil Survey of Los Alamos County, New Mexico," LA-G779-MS, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table G-1
Use and Management of Containers
Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Modification
§270.15	Specific information requirements for containers:	G.0
§270.15(a)	A description of the containment system to demonstrate compliance with §264.175 including at a minimum:	G.1
§270.15(a)(1)	Basic design parameters, dimensions, and materials of construction	G.1
§270.15(a)(2)	How the design promotes drainage or how containers are kept from contact with standing liquids in the containment system	G.2
§270.15(a)(3)	Capacity of the containment system relative to the number and volume of containers to be stored	G.1
§270.15(a)(4)	Provisions for preventing or managing run-on	G.7
§270.15(a)(5)	How accumulated liquids can be analyzed and removed to prevent overflow	G.6
§270.15(b)	For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with §264.175(c) including:	G.1
§270.15(b)(1)	Test procedures and results or other documentation or information to show that the wastes do not contain free liquids	G.1
§270.15(b)(2)	A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids	G.1
§270.15(c)	Sketches, drawings, or data demonstrating compliance with §264.176 (location of buffer zone and containers holding ignitable or reactive wastes) and §264.177(c) (location of incompatible wastes), where applicable	G.8
§270.15(d)	Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with §264.177(a) and (b) and §264.17(b) and (c)	G.8
§270.15(e)	Information on air emission control equipment as required in §270.27	G.9
§270.27(a)	Specific information requirements for air emission controls	G.9
§270.27(a)(2)	Identification of each container area subject to the requirements of §264, Subpart CC and certification by the owner or operator that the requirements are met	G.9
§270.27(a)(3)	Documentation that each enclosure used to control air emissions from containers are in accordance with the requirements of §264.1086(b)(2)(I) includes information prepared by the owner or operator or manufacturer or vendor describing the enclosure design and certification that the enclosure meets the specifications listed in §265.1087(b)(2)(ii)	NA[a]
§270.27(a)(5)	Documentation for each closed-vent system and control device installed in accordance with the requirements of §264.1087 that includes design and performance information as specified in §270.24 (c) and (d)	NA
§270.27(a)(6)	An emission monitoring plan for both Method 21 and control device monitoring methods. The plan must include:	NA
§270.27(a)(7)	Implementation schedule	NA

a NA = not applicable



177

FIGURE G-1
LOCATION MAP SHOWING SECURITY FENCES, ENTRY GATES, AND ACCESS CONTROL AT THE PROPOSED TRANSURANIC WASTE FACILITY

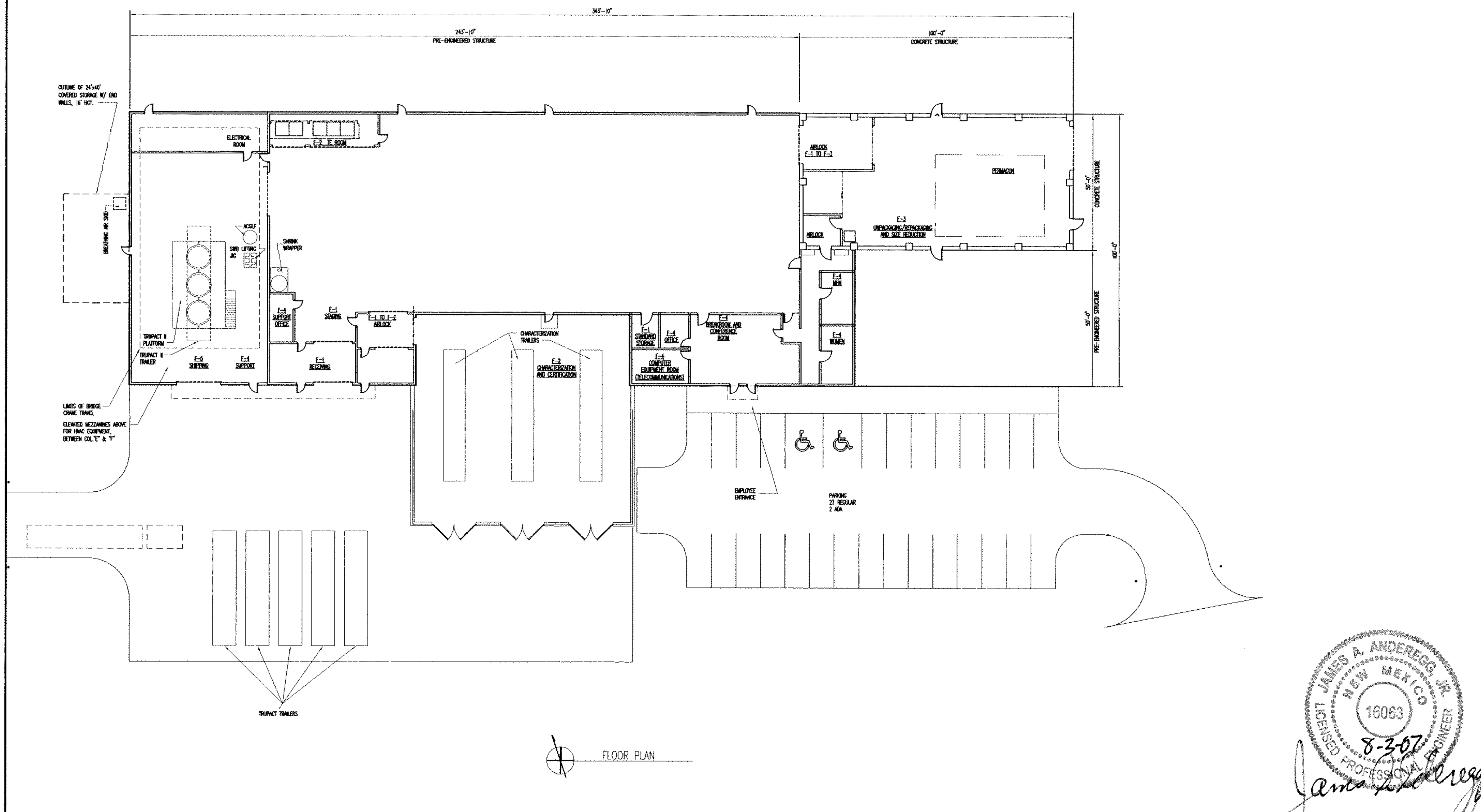
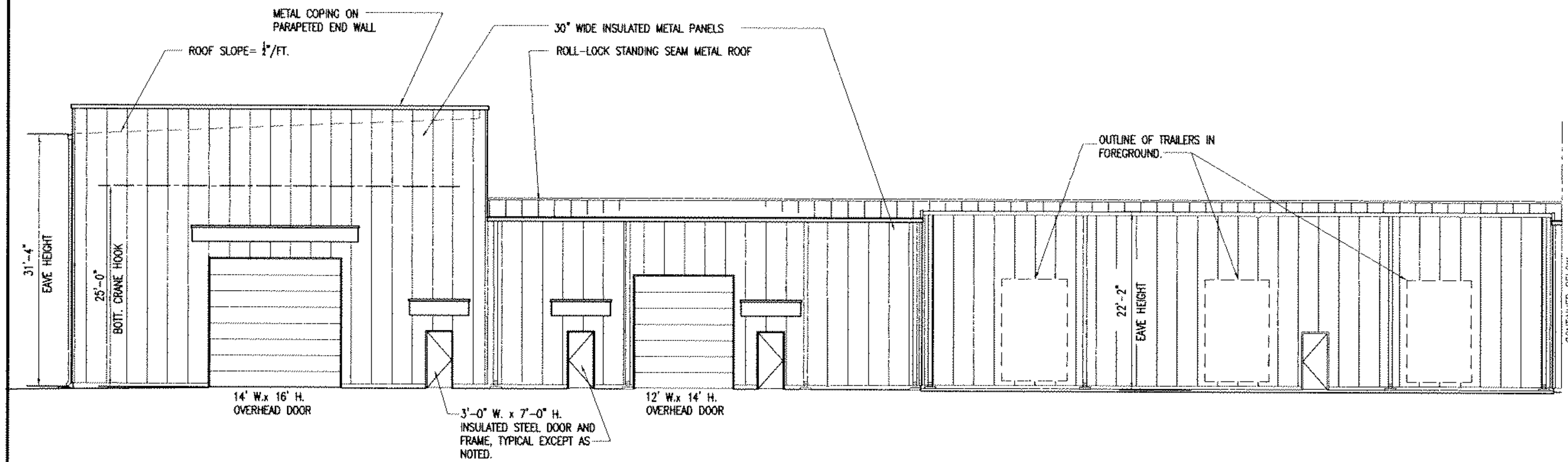
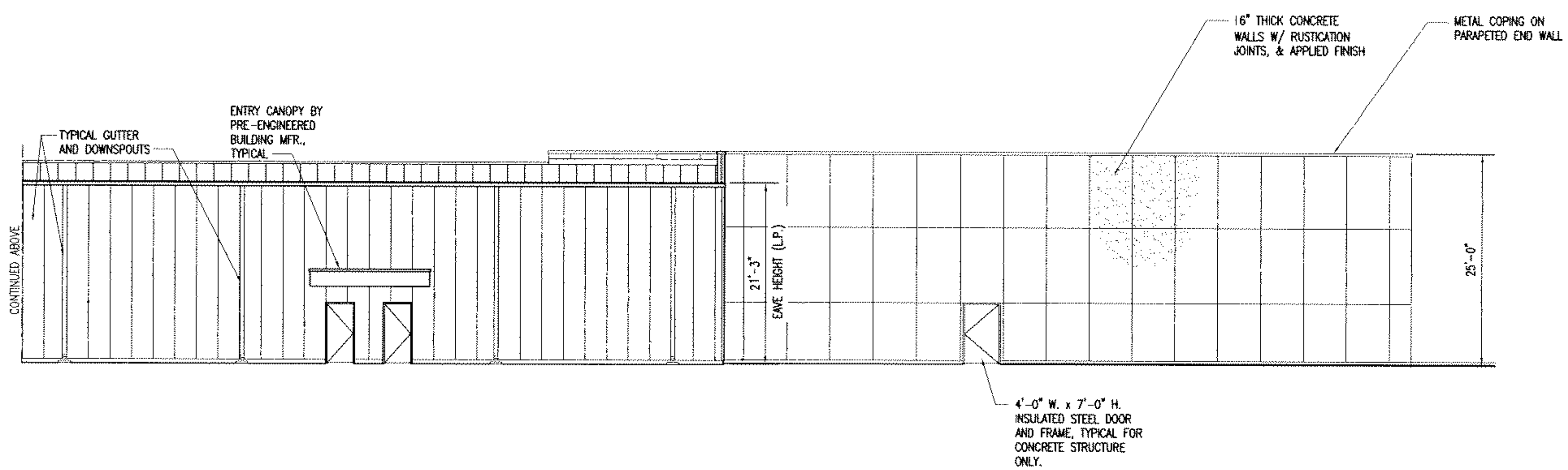


FIGURE G-2
PROPOSED TRANSURANIC WASTE
FACILITY CONTAINER
STORAGE/TREATMENT UNIT FLOOR PLAN



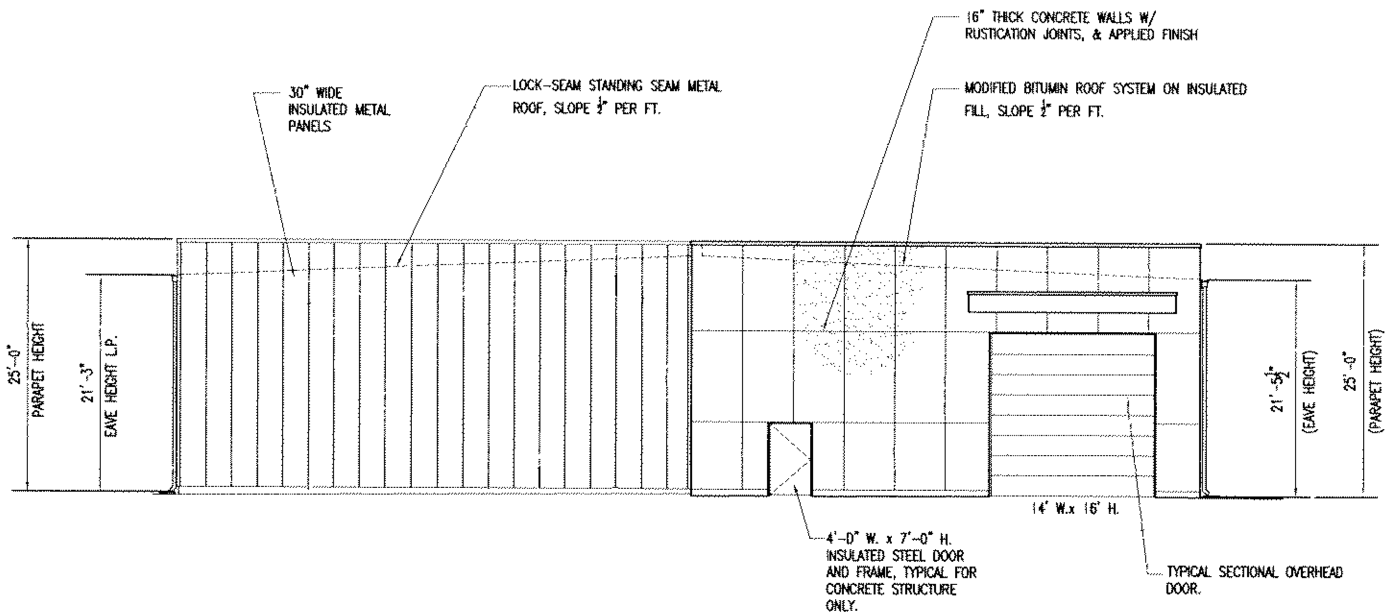
SOUTH EXTERIOR ELEVATION



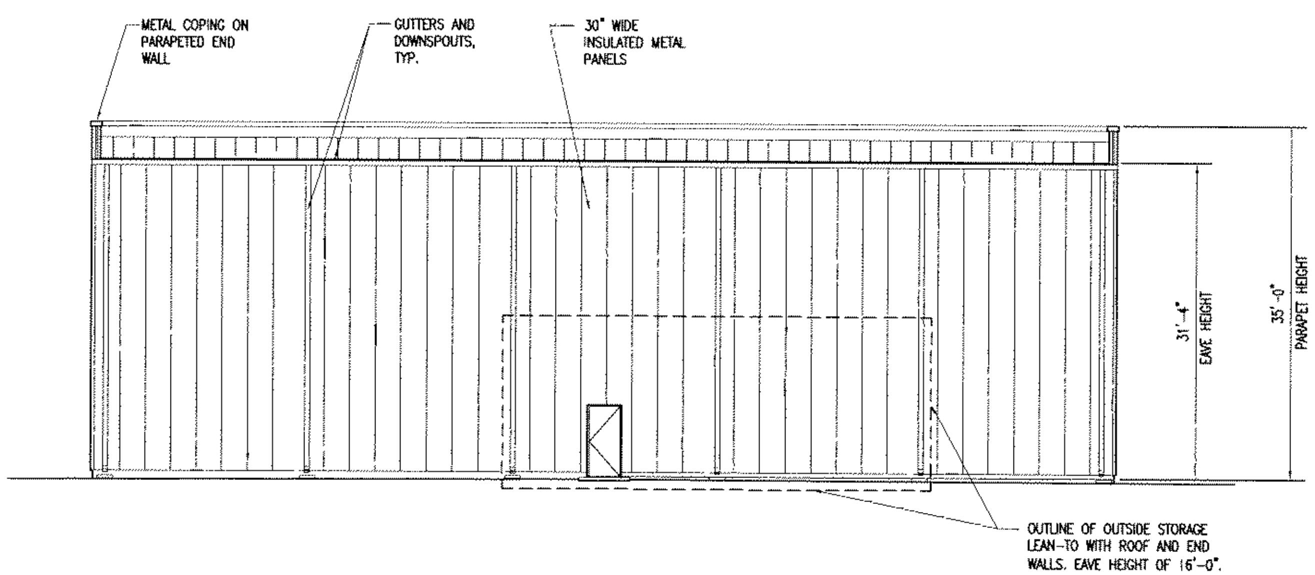
SOUTH EXTERIOR ELEVATION

JAMES A. ANDEREGG, JR.
NEW MEXICO
16063
LICENSED PROFESSIONAL ENGINEER
8-3-07

FIGURE G-3
PROPOSED TRANSURANIC WASTE
FACILITY STORAGE BUILDING
ELEVATIONS (SOUTH)



EAST EXTERIOR ELEVATION



WEST EXTERIOR ELEVATION

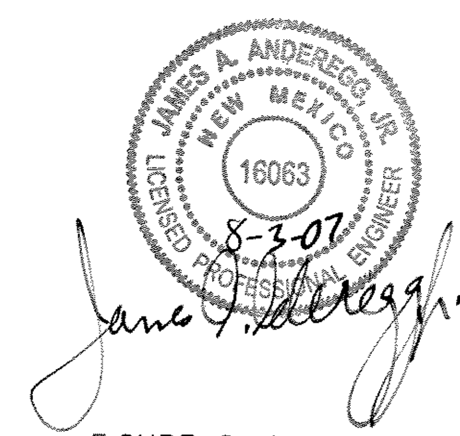


FIGURE G-4
PROPOSED TRANSURANIC WASTE
FACILITY STORAGE BUILDING
ELEVATIONS (EAST AND WEST)