RED LANL TA16/00

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

JAN 31 2000

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

JAN 2000
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Mr. John E. Kieling
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Building A
P.O. Box 26110
Santa Fe, NM 87505

Dear Mr. Kieling:

Subject: Reformat Submittal - Los Alamos National Laboratory (LANL) Technical Area 16, Part B Permit Renewal Document, Rev. 3.0, LANL Hazardous Waste Facility Permit No. NM 0890010515-1

The purpose of this letter is to provide an updated and reformatted RCRA Part B permit renewal application for the LANL TA-16 hazardous and mixed waste management units. The full title of the enclosed document is the "*Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Document*," Revision 3.0. The document is being submitted in response to the direction contained in a letter received from the New Mexico Environment Department (NMED) on November 5, 1999 (to Dr. John C. Browne and Mr. David A Gurulé from Gregory J. Lewis, Water and Waste Management Division, NMED, "Rescission of TA-16 Administrative Completeness Determination").

The original Part B permit application for TA-16 was submitted to NMED on June 29, 1995, and was entitled "*RCRA Part B Permit Application, Technical Area 16; Building 88, Container Storage Area; Flash Pad 387, Open Burn Unit; Burn Pads 388 and 399, Open Burn Units; Burn Tray 394, Open Burn Unit; Filter Vessels 401 and 406, Open Burn Units.*" Revision 3.0 is a complete replacement of the previous document. This reformat package amends the original document to match the permit renewal format developed with your office and to incorporate additional waste management related information or changes that have occurred in the facility operations since 1995. Most notably, these facility changes include the deletion of structures (TA-16-387 and TA-16-394) that are currently slated for closure. The upgrade and redesignation of TA-16-388 as a propane burner flash pad and oil/solvent burn tray, approved as a Change During Interim Status on May 12, 1999, is also described.

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TR

If you should have any questions or comments concerning this permit submittal, please contact Jody Plum of my staff at (505) 665-5042 or Jack Ellvinger, UC, at (505) 667-0633.

Sincerely,

David A. Gurulé, P.E.
Area Manager

LAAME:3JP-135

Enclosure

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Contract 003CT0008-8L
Project No. 801448.08.01
January 2000

Los Alamos National Laboratory
Technical Area 16
Part B Permit Renewal Document

Revision 3.0

Prepared by:

Los Alamos National Laboratory
Hazardous and Solid Waste Group (ESH-19)
Los Alamos, New Mexico 87545

Document:	**LANL TA-16 Part B**
Revision No.:	**3.0**
Date:	**January 2000**

Los Alamos National Laboratory
Technical Area 16
Part B Permit Renewal Document

Revision 3.0

Prepared by:
Los Alamos National Laboratory
Hazardous and Solid Waste Group (ESH-19)
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January 2000

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LIST OF ATTACHMENTS

ATTACHMENT	TITLE
A	Facility Description
B	Waste Analysis Plan
C	Inspection Plan
D	Personnel Training Plan
E	Contingency Plan
F.1	Closure Plan for Technical Area 16, Building 88, Container Storage Unit
F.2	Closure Plan for Technical Area 16 Burn Ground Unit
G	Container Management
H	Technical Area (TA) 16 Burn Ground Unit Management

LIST OF ABBREVIATIONS/ACRONYMS

CSU	container storage unit
EPA	U.S. Environmental Protection Agency
ESA	Engineering Sciences and Applications
ft	foot/feet
HE	high explosives
HRMB	Hazardous and Radioactive Materials Bureau
LANL	Los Alamos National Laboratory
MDA	Material Disposal Area
NMED	New Mexico Environment Department
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
SWMU	solid waste management unit
SWPP	Stormwater Pollution Prevention
TA	technical area

1.0 INTRODUCTION

This revised “Los Alamos National Laboratory Technical Area 16 Part B Permit Renewal Document” is submitted to address the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), revised January 1, 1997 [1-1-97], requirements specific to hazardous and mixed waste container storage operations and hazardous waste open burning operations at Technical Area (TA) 16. This permit renewal document contains much of the same information for TA-16 that was included in the “RCRA Part B Permit Application: Technical Area 16; Building 88, Container Storage Area; Flash Pads 387 and 388, Open Burn Units; Burn Pads 388 and 399, Open Burn Units; Burn Trays 388 and 394, Open Burn Units; and Filter Vessels 401 and 406, Open Burn Units," Revisions 2.0 and 2.1, submitted in June 1995 and April 1996, respectively (Los Alamos National Laboratory [LANL], 1995, 1996). The information in that application has been reformatted in this permit renewal document to meet the permitting strategy outlined by the New Mexico Environment Department Hazardous and Radioactive Materials Bureau (HRMB) in correspondence dated February 5, 1998. The information has also been updated to indicate the consolidation of the open burn and flash pad waste treatment structures into one waste management unit, identified as the TA-16 Burn Ground Unit. In addition, the updated information no longer addresses Flash Pad 387 and Burn Tray 394; these structures will undergo closure.

As presented in the February 1998 HRMB correspondence, TA-specific permit applications, permit modification requests, and permit renewal documents will cover any details and/or requirements not addressed in the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (LANL, 1998a), hereinafter referred to as the LANL General Part B. The LANL General Part B will serve in the operating permit as an "umbrella" document, covering the requirements of the New Mexico Hazardous Waste Act and implementing regulations, specifically 20 NMAC 4.1 [1-1-97], common to all TAs. Together, information provided in this document and in the LANL General Part B will meet the applicable requirements specified in 20 NMAC 4.1, Subparts V and IX [1-1-97]. This TA-16 Part B permit renewal document is organized similar to the LANL General Part B and contains six primary sections and numerous attachments. Attachments A through F in this document correspond to and supplement Appendices A through F in the LANL General Part B.

In accordance with HRMB=s permitting strategy, LANL submitted the ALos Alamos National Laboratory General Part A Permit Application≅ in April 1998 (LANL, 1998b), hereinafter referred to as the LANL General Part A. The LANL General Part A consolidated information from previous

site-wide and TA-specific Part A submittals into one comprehensive document, identifying all hazardous and mixed waste treatment, storage, and disposal facilities subject to 20 NMAC 4.1, Subparts V, VI, and IX [1-1-97], at LANL as of April 30, 1998. The LANL General Part A serves as a companion document to the LANL General Part B and TA-specific permit applications, permit modification requests, and permit renewal documents, including this TA-16 Part B permit renewal document. The LANL General Part A includes maps, figures, and lists of authorized wastes that may be referenced for the waste management structures described in this permit renewal document.

In the LANL General Part A, the LANL General Part B, and this permit renewal document, a unit to be permitted may sometimes be referred to as a "facility." The term "facility," as it appears in this context, is used only to denote building names and does not imply the regulatory meaning of "facility" as defined in 20 NMAC 4.1, Subpart I, 260.10 [1-1-97]. However, pursuant to 20 NMAC 4.1, Subpart I, 260.10 [1-1-97], 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 renewal document, as appropriate. Where applicable, regulatory citations in this document reference 20 NMAC 4.1, which adopts, with a few limited exceptions, all of the Code of Federal Regulations, Title 40, Parts 260 to 266, Part 268, Part 270, and Part 273.

Table 1-1

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋270.14(b)(1)	General facility description	Attachment A[a]
∋270.14(b)(2)	Chemical and physical analyses	Attachment B[a]
∋270.14(b)(3)	Waste analysis plan	Attachment B[a]
∋264.13(b)	Development and implementation of waste analysis plan	Attachment B[a]
∋264.13(c)	Off-site waste analysis requirements	Attachment B[a]
∋270.14(b)(4)	Security procedures and equipment	Attachments G and H
∋264.14	Security	Attachments G and H
∋270.14(b)(5)	General inspection requirements	Attachment C[a]
∋264.15(b)	General inspection requirements	Attachment C[a]
∋264.174	Container inspections	Attachment C[a]
∋264.193(i)	Tank inspections	NA[b]
∋264.195	Overfill control inspections	NA
∋264.226	Surface impoundments monitoring and inspection	NA
∋264.254	Waste pile monitoring and inspection	NA
∋264.273	Land treatment design and operating requirements	NA
∋264.303	Landfill monitoring and inspection	NA
∋264.347	Incinerator monitoring and inspection	NA
∋264.602	Miscellaneous units	Attachment C[a]
∋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
∋264.1088	Subpart CC inspection and monitoring requirements	NA
∋270.14(b)(6)	Request for waiver from preparedness and prevention requirements of 264 Subpart C	NA
∋270.14(b)(7)	Contingency plan requirements under 264 Subpart D	Attachment E[a]
∋264, Subpart D	Contingency plan and emergency procedures	Attachment E[a]
∋264.227	Surface impoundment emergency repairs; contingency plans	NA
∋264, Subpart C	Preparedness and prevention	Attachments G and H
∋270.14(b)(8)	Preparedness and prevention	Attachments G and H

Refer to footnotes at end of table.

Table 1-1 (Continued)

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋270.14(b)(8)(i)	Prevention of hazards in unloading operations (ramps and special forklifts)	Attachments G and H
∋270.14(b)(8)(ii)	Runoff prevention with berms, trenches, and dikes	2.0
∋270.14(b)(8)(iii)	Prevention of contamination of water supplies	Attachments G and H
∋270.14(b)(8)(iv)	Mitigation effects of equipment failure and power outages	Attachments G and H
∋270.14(b)(8)(v)	Prevention of undue exposure of personnel by use of personal protective equipment	Attachments G and H
∋270.14(b)(8)(vi)	Prevention of release to the atmosphere	Attachments G and H
∋270.14(b)(9)	Prevention of accidental ignition or reaction	2.0[a], Attachments G and H
∋264.17	General requirements for ignitable, reactive, or incompatible wastes	2.0[a], Attachments G and H
∋264.17(c)	Documentation of compliance with 264.17 (general requirements for ignitable, reactive, or incompatible wastes)	2.0[a], Attachments G and H
∋270.14(b)(10)	Traffic pattern, volume, and controls	Attachment A[a]
	Identification of turn lanes	NA
	Identification of traffic/stacking lanes	NA
	Description of road surface	Attachment A[a]
	Description of road load-bearing capacity	Attachment A[a]
	Identification of type and number of traffic controls	Attachment A
∋270.14(b)(11)	Facility/unit location information	Attachment A
∋264.18	Location standards	Attachment A
∋270.14(b)(11)(i)	Seismic standard applicability [264.18(a)]	Attachment A
∋270.14(b)(11)(ii)	Seismic standard requirements	Attachment A
∋270.14(b)(11)(ii)(A)	No fault within 3,000 feet (ft) with displacement in Holocene time	NA
∋270.14(b)(11)(ii)(A)(1)	Published geological studies	NA
∋270.14(b)(11)(ii)(A)(2)	Aerial reconnaissance of a five-mile radius from the facility	NA
∋270.14(b)(11)(ii)(A)(3)	Analysis of aerial photographs covering 3,000-ft radius from the facility/unit	NA
∋270.14(b)(11)(ii)(A)(4)	Reconnaissance based on walking portions of the area within 3,000 ft of the facility	NA

Refer to footnotes at end of table.

Table 1-1 (Continued)

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋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	NA
∋270.14(b)(11)(iii)	100-year floodplain standard	Attachment A[a]
∋270.14(b)(11)(iv)	If facility is within 100-year floodplain	NA
∋270.14(b)(11)(iv)(A)	Engineering analyses of hydrostatic forces expected in a 100-year flood	NA
∋270.14(b)(11)(iv)(B)	Structural engineering studies for flood protection to prevent washout	NA
∋270.14(b)(11)(iv)(C)	Detailed description of procedures to remove hazardous waste to safety before flood reaches the waste	NA
∋270.14(b)(11)(iv)(C)(1)	Timing of removal	NA
∋270.14(b)(11)(iv)(C)(2)	Location to be moved to	NA
∋270.14(b)(11)(iv)(C)(3)	Dedicated equipment and personnel to ensure removal	NA
∋270.14(b)(11)(iv)(C)(4)	Potential for accidental discharge during movement	NA
∋270.14(b)(11)(v)	Plan to show how the facility will be brought into compliance with 264.18(b)	NA
∋270.14(b)(12)	Personnel training program	Attachment D[a]
∋270.14(b)(13)	Closure and post-closure plans	Attachments F.1 and F.2[a]
∋264.112	Amendment of closure plan	Attachments F.1 and F.2[a]
∋264.118	Post-closure plan; amendment of plan	Attachments F.1 and F.2[a]
∋264.178	Closure/containers	Attachment F.1[a]
∋264.197	Closure/tanks	NA
∋264.228	Closure/post-closure/surface impoundments	NA
∋264.258	Closure/post-closure/waste piles	NA
∋264.280	Closure/post-closure/land treatment	NA
∋264.310	Closure/post-closure/landfills	NA
∋264.351	Closure/incinerators	NA
∋264.601	Miscellaneous units	Attachment F.2[a]
∋264.603	Post-closure care	Attachments F.1 and F.2[a]
∋270.14(b)(14)	Post-closure notices (264.119)	Attachments F.1 and F.2[a]
∋270.14(b)(15)	Closure cost estimate (264.142)	Attachments F.1 and F.2[a]

Refer to footnotes at end of table.

Regulatory Citation(s)	Description of Requirement	Location in this Document
	Financial assurance (264.143)	Attachments F.1 and F.2[a]

Table 1-1 (Continued)

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋270.14(b)(16)	Post-closure cost estimate (264.144)	Attachments F.1 and F.2[a]
	Post-closure care financial assurance (264.145)	Attachments F.1 and F.2[a]
∋270.14(b)(17)	Liability insurance (264.147)	Attachments F.1 and F.2[a]
∋270.14(b)(18)	Proof of financial coverage (264.149-150)	Attachments F.1 and F.2[a]
∋270.14(b)(19)	Topographic map requirements	Attachment A[a,c]
∋270.14(b)(19)(i)	Map scale and date	Attachment A[a,c]
∋270.14(b)(19)(ii)	100-year floodplain	Attachment A[a]
∋270.14(b)(19)(iii)	Surface waters	Attachment A
∋270.14(b)(19)(iv)	Land use	Attachment A
∋270.14(b)(19)(v)	Wind rose	Attachment A
∋270.14(b)(19)(vi)	Map orientation	Attachment A[a,c]
∋270.14(b)(19)(vii)	Legal boundaries	Attachment A[c]
∋270.14(b)(19)(viii)	Access controls	Attachment A
∋270.14(b)(19)(ix)	Wells	Attachment A
∋270.14(b)(19)(x)	Buildings	Attachment A
	Treatment, storage, and disposal operations	Attachment A
	Run-on/run-off control systems	2.0, Attachments A, G, and H
	Storm sewer systems	Attachment A[a]
	Sanitary sewer systems	Attachment A[a]
	Process sewer systems	Attachment A[a]
	Loading/unloading areas	Attachment A
	Fire control facilities	Attachment A[a]
∋270.14(b)(19)(xi)	Drainage barriers	2.0, Attachment A
∋270.14(b)(19)(xii)	Location of operational units	2.0, Attachment A
∋270.14(b)(20)	Other federal laws	3.0[a]
∋270.3(a)	Wild and Scenic Rivers Act	3.0[a]
∋270.3(b)	National Historic Preservation Act	3.0[a]
∋270.3(c)	Endangered Species Act	3.0[a]

Refer to footnotes at end of table.

Table 1-1 (Continued)

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋270.3(d)	Costal Zone Management	3.0[a]
∋270.3(e)	Fish and Wildlife Coordination Act	3.0[a]
∋270.3(f)	Executive Orders	3.0[a]
∋270.14(b)(21)	Notice of extension approval for land disposal facilities	NA
∋270.14(c)	Groundwater monitoring requirements	Attachment A[a]
∋270.14(c)(1)	Groundwater monitoring under 265.90 through 265.94	NA
∋270.14(c)(2)	Identification of uppermost aquifer, groundwater flow rate and direction	NA
∋270.14(c)(3)	A topographic map required under 270.14(b)(19) that identifies proposed point of compliance	NA
	Proposed location of groundwater monitoring wells under 264.97.	NA
∋270.14(c)(4)	Description of plume of contamination that has entered groundwater	NA
∋270.14(c)(4)(i)	Extent of plume indicated on topographic map	NA
∋270.14(c)(4)(ii)	Identification of constituents and concentration for Appendix IX of 264	NA
∋270.14(c)(5)	Detailed plan and an engineering report describing proposed groundwater monitoring program under 264.97	NA
∋270.14(c)(6)	No releases detected in groundwater (264.98)	NA
∋270.14(c)(6)(i)	List of proposed indicator parameters	NA
∋270.14(c)(6)(ii)	Proposed groundwater monitoring system	NA
∋270.14(c)(6)(iii)	Background values for each proposed monitoring parameter	NA
∋270.14(c)(6)(iv)	Description of proposed sampling, analyses and statistical comparisons to be used	NA
∋270.14(c)(7)	Release detected at point of compliance requires corrective action under 264.100	NA
∋270.14(d)	Information requirements for solid waste management units (SWMU)	4.0
∋270.14(d)(1)(i)	Location of SWMUs on topographic map	4.0
∋270.14(d)(1)(ii)	Types of SWMUs	4.0
∋270.14(d)(1)(iii)	Dimensions and descriptions of SWMUs	4.0
∋270.14(d)(1)(iv)	Dates of operation	4.0

Refer to footnotes at end of table.

Table 1-1 (Continued)

Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
∋270.14(d)(1)(v)	Waste types managed at SWMU	4.0
∋270.14(d)(2)	Information on releases from SWMUs	4.0
∋270.15	Containers	2.0, Attachment G
∋270.16	Tank systems	NA
∋270.16(a)	Written assessment and certification	NA
∋270.16(b)	Capacity/dimensions	NA
∋270.16(c)	Systems and controls	NA
∋270.16(d)	Piping and process flow	NA
∋270.16(e)	External corrosion protection	NA
∋270.16(f)	Installation	NA
∋270.16(g)	Secondary containment system	NA
∋270.16(h)	Request for variance from secondary containment	NA
∋270.16(i)	Spill prevention	NA
∋270.16(j)	Ignitable, reactive, or incompatible wastes	NA

[a] Requirement or information is also addressed in the "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0 (LANL, 1998a), as appropriate.

[b] NA = not applicable.

[c] Some of the topographic map requirements are addressed in the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998b).

2.0 STORAGE AND TREATMENT AT TECHNICAL AREA 16

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¶
2.1 TA-16-88 CONTAINER STORAGE UNIT¶
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This section provides a general description of the Los Alamos National Laboratory (LANL) Technical Area (TA) 16, Building 88 (TA-16-88), container storage unit (CSU), hereinafter referred to as the TA-16-88 CSU, and its waste management practices. It also provides a general description of the TA-16 Burn Ground Unit structures and general waste management practices for wastes treated at that unit. Attachment G of this permit renewal document contains more detailed information on and figures of the TA-16-88 CSU and the waste management practices associated with it. Similar information is provided in Attachment H for the TA-16 Burn Ground Unit. A summary of applicable regulatory references for these units and the corresponding location where the requirement is addressed in this permit renewal document are located in Attachments G and H, Tables G-1 and H-1.

2.1 TA-16-88 CONTAINER STORAGE UNIT

This section presents a brief description of the TA-16-88 CSU. 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 NMAC 4.1), Subpart IX, 270.15, and 20 NMAC 4.1, Subpart V, Part 264, Subpart I, revised January 1, 1997 [1-1-97] for the TA-16-88 CSU.

2.1.1 Storage Location and Capacity

TA-16 is located in the southwestern quadrant of LANL at the west end of the Pajarito Plateau, near the foothills of the Jemez Mountains (Figure A-1 in Attachment A). TA-16-88 is a single-room building located approximately 1,000 feet (ft) east of Anchor Ranch Road and 1,000 ft south of K-Site Road (Figure G-1 in Attachment G). The CSU, which measures approximately 10 ft by 15 ft, is located in the northwest corner of the building (Figure G-2 in Attachment G).

The TA-16-88 CSU has an overall storage capacity of 275 gallons and will be used to store hazardous and mixed low-level solid wastes. No liquid and/or potentially liquid-bearing wastes are stored. General dimensions, containment features, and materials of construction are provided in Attachment G of this permit renewal document to satisfy the requirements of 20 NMAC 4.1, 270.15(a)(1) and (2) [1-1-97].

2.1.2 Storage Containers

Waste containers that may be stored in the TA-16-88 CSU include 55-gallon drums, crates, and metal, fiber, or wooden boxes. Small containers and miscellaneous, irregularly-shaped containers may also be used. Overpacks may be used when a container's integrity is suspect.

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The most common container used for waste storage at TA-16-88 is the 55-gallon drum. The standard drum in use is constructed of steel and has an inner diameter of approximately 22 inches and a usable inside height of approximately 33 inches. Another type of drum that may be used at the TA-16-88 CSU is the polyethylene drum. Constructed of high-density blow-molded polyethylene, these drums come in various sizes and dimensions. Capacities range from 5 gallons up to 55 gallons. Types of closures include screw-type bungs (for closed-head containers), lever-lock rings, snap-on lids, and screw-on lids. Various types of metal boxes are also used for storage. The metal boxes (including overpacks) vary in size and typically have continuous welds both inside and outside on all four sides and on the bottom. Steel boxes are constructed of welded carbon steel and are elevated by design. Metal boxes have rubber gaskets with either bolt-on, clip-pinned, or hinged lids. Custom metal and wooden boxes may be constructed for oversized and/or unique wastes. Other fiber boxes may also be used, as appropriate.

2.1.3 Minimum Aisle Space and Storage Configuration

Waste containers in the TA-16-88 CSU are stored in rows with a minimum aisle space of 24 inches. The container storage location is demarcated with tape to alert workers to the presence of waste containers.

Storage configuration of containers within a row depends upon the type of container, its size, and its weight restrictions. Drums may be stacked to a maximum of two high. Additional information on the storage and handling of waste containers is provided in Attachment G.

2.1.4 Authorized Waste Identification

The TA-16-88 CSU will store containers of hazardous and mixed low-level solid waste bearing the appropriate U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers. The types of wastes that may be stored in the CSU are listed in the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998b), hereinafter referred to as the LANL General Part A.

2.1.5 Condition of Containers

Prior to storage, any storage container at the TA-16-88 CSU that is not in good condition (e.g., severe rusting, apparent structural defects) is overpacked or the wastes are repackaged in containers that are in good condition. This practice meets the requirements of 20 NMAC 4.1, Subpart V, 264.171 [1-1-97].

2.1.6 Compatibility of Waste with Containers

The TA-16-88 CSU will only store containers made of or lined with materials that will not react with and are otherwise compatible with the waste stored in them. This fulfills the requirements of 20 NMAC 4.1, Subpart V, 264.172 [1-1-97].

2.1.7 Management of Containers

Waste containers stored at the TA-16-88 CSU are handled in a manner that will not cause them to rupture or leak, as required in 20 NMAC 4.1, Subpart V, 264.173(b) [1-1-97]. All containers are kept closed during storage in accordance with 20 NMAC 4.1, Subpart V, 264.173(a) [1-1-97], except when waste is added to or removed from the container. Additional information on container management is located in Attachment G of this document.

2.1.8 Containment Systems

In accordance with 20 NMAC 4.1, Subpart IX, 270.15(b)(1) [1-1-97], acceptable knowledge may be used initially to verify the absence of free liquids in containers. No containers bearing suspect or known free liquids are allowed at the TA-16-88 CSU. Therefore, secondary containment (e.g., self-containment pallets) is not required. The most likely source of liquids accumulation would be from water generated during fire-suppression activities. In that case, the resulting wastewater would be removed and containerized as soon as possible and characterized as a newly-generated waste in accordance with Appendices B and E of the “Los Alamos National Laboratory General Part B Permit Application,” Revision 1.0 (LANL, 1998a), hereinafter referred to as the LANL General Part B.

2.1.9 Inspection Schedules and Procedures

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The purpose of inspections is to identify deterioration of containers and/or loss of integrity of the containment system, as required by 20 NMAC 4.1, Subpart V, 264.174 [1-1-97]. The inspections include checking the structural integrity of the containers (e.g., for bulging or warping). Inspections will be conducted in accordance with Appendix C of the LANL General Part B.

2.1.10 Special Requirements for Ignitable, Reactive, and Incompatible Wastes

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The TA-16-88 CSU is located within a building approximately one-half mile from the nearest LANL facility boundary; therefore, containers holding ignitable wastes are located at least 50 feet from the facility's property line. Stored wastes are protected from sources of ignition. Ignitable waste is separated and protected from welding activities, hot surfaces, frictional heat, and sources of sparks. Smoking is not allowed within TA-16-88 and a "No Smoking" sign is conspicuously placed at the CSU. Together, these measures meet the requirements of 20 NMAC 4.1, Subpart V, 264.17(a) and (b) and 264.176 [1-1-97]. Reactive wastes are not stored at the TA-16-88 CSU.

Incompatible wastes, if any, are kept segregated during storage to meet the requirements of 20 NMAC 4.1, Subpart V, 264.177(c) [1-1-97]. 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 NMAC 4.1, Subpart V, 264.177(a) and (b), and 20 NMAC 4.1, Subpart IX, 270.15(d) [1-1-97].

2.1.11 Closure

Should closure of the TA-16-88 CSU become necessary, closure activities would include removal of hazardous and mixed waste from the CSU and decontamination of any contaminated equipment associated with the unit. Closure will minimize the need for further maintenance, preclude the release of hazardous waste or constituents to environmental media, and be protective of human health. Detailed closure procedures for the TA-16-88 CSU are addressed in Attachment F.1 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.111 and 264.178 [1-1-97].

2.1.12 Control of Run-On and Runoff

Run-on into and runoff from the TA-16-88 CSU is very unlikely to occur. The slope surrounding TA-16-88 directs potential run-on away from the building. Figure A-12 in Attachment A of this permit renewal document shows the contours and surface drainage around TA-16-88. The CSU is fully contained within the building, the floor of the building is sealed with epoxy paint, and curbs extend upward at the walls. No water is supplied directly to the building. Only wastes in solid form are stored in the CSU, and the most likely liquids accumulation would result during fire-suppression activities. These liquids would generally be contained within the curbed portion of the building. Therefore, potential runoff from the CSU would be contained and controlled. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.175(b)(4), and 20 NMAC 4.1, Subpart IX, 270.14(b)(8)(ii) [1-1-97].

2.2 TA-16 BURN GROUND UNIT

This section presents a brief description of the TA-16 Open Burn Unit. The information provided in this section is submitted to address the applicable miscellaneous unit requirements of 20 NMAC 4.1, Subpart IX, 270.23, and 20 NMAC 4.1, Subpart V, Part 264, Subpart X [1-1-97], as well as thermal treatment unit requirements in 20 NMAC 4.1, Subpart VI, Part 265, Subpart P [1-1-97].

2.2.1 TA-16 Burn Ground Unit Structures Locations and Capacities

TA-16 is located in the southwestern quadrant of LANL at the west end of the Pajarito Plateau, near the foothills of the Jemez Mountains (see Figure A-1 in Attachment A). The TA-16 Burn Ground Unit is comprised of several open burning structures (see Figures H-1 and H-2 in Attachment H), which are described below.

The TA-16-388 Flash Pad/Burn Tray (see Figures H-3, H-4, and H-5 in Attachment H) treats waste that is contaminated with high explosives (HE). The wastes that may be treated include, but are not limited to, HE-contaminated solvents and water/solvent mixtures; oils; particulate wastes (e.g., soils and activated carbon); solid combustibles (e.g., wood, cardboard, paper, and cloth); and incombustible materials (e.g., glass, metal parts, and equipment). Because most of the waste treated at TA-16-388 is not combustible, propane burners are used to supply heat to destroy the HE contamination. The maximum treatment capacity of the TA-16-388 Flash Pad is 40,000 pounds of waste for each treatment; however, burns are usually much smaller to assure that all materials are sufficiently heated to destroy the HE. The maximum treatment capacity of the TA-16-388 Burn Tray

is listed in the LANL General Part A as 100 gallons. However, the amount of waste treated per burn is adjusted to the amount of liquid that can be treated in a single day. This amount is usually from 5 to 30 gallons, considerably less than the maximum treatment capacity.

The TA-16-399 HE Burn Tray (Figure H-6 in Attachment H) treats bulk HE to destroy the characteristic of reactivity (D003). Most HE burns very well so that no additional source of heat is needed. If any HE residue remains after burning, the waste may be burned again to ensure that all HE is destroyed. The capacity of the HE Burn Tray is 1,000 pounds per burn.

The TA-16-401 and TA-16-406 Sand Filters (Figure H-7 in Attachment H) are used to separate suspended HE from wastewater and to burn other HE solids. HE residue remains on the surface of the sand filters after wastewater is filtered. Wet HE from other sources is added, the sand filters are covered, and hot air is used to dry the HE before burning. HE normally treated on the TA-16-399 HE Burn Tray can also be burned on the sand filters if the burn tray is not available or if additional HE is needed to burn the accumulated solids. The maximum treatment capacity of each sand filter is 1,000 pounds per burn.

LANL minimizes the impact to the environment by conducting treatment operations in strictly controlled, remote areas within LANL boundaries. Treatment operations are not conducted during adverse atmospheric conditions. The operational and waste management practices for the TA-16 Burn Ground Unit are more fully described in Attachment H.

2.2.2 Authorized Waste Identification

The TA-16 Burn Ground Unit will treat hazardous wastes bearing a variety of EPA Hazardous Waste Numbers. The types of wastes that may be treated at the TA-16 Burn Ground Unit are listed in the LANL General Part A.

2.2.3 Containment Systems

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Containment is used to prevent releases during waste staging, burning, and residue management, as described below.

The TA-16-388 Flash Pad is located on a concrete pad with walls on the back and on two sides. The pad is sloped toward the back wall, so that any releases will be contained on the pad and can

be removed and properly treated or disposed. The flash pad has a retractable cover, mainly used to prevent run-on. However, the cover also acts as containment to reduce the potential for residues to be blown off the pad by wind.

The TA-16-388 Burn Tray sits in a larger tray, which provides secondary containment for spills that may occur during waste handling. The burn tray is covered when a burn is complete to reduce the likelihood of residue dispersion by wind.

The TA-16-399 HE Burn Tray is installed on a concrete pad that is surrounded by earthen berms. Wastes are staged on this pad just before a burn, so releases during staging are highly unlikely. After a burn is completed, any residue is covered until it can be removed, reducing the likelihood of ash dispersion by wind.

The TA-16-401 and TA-16-406 Sand Filters are contained in steel tanks. Any liquids introduced into the tanks are filtered and then piped directly into the HE Wastewater Treatment Facility, where they are treated. When solid HE is present on the sand filter surfaces, the sand filters are covered to ensure that the HE does not become windblown and is not accidentally detonated.

2.2.4 Inspection Schedules and Procedures

In accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.15 and 264.602 [1-1-97], the TA-16 Burn Ground Unit structures will be inspected daily when in use (i.e., when wastes are managed at the structure) and weekly when not in use. Inspection parameters are specified in Appendix C of the LANL General Part B.

2.2.5 Special Requirements for Ignitable, Reactive, and Incompatible Wastes [20 NMAC 4.1, Subpart V, 264.17(a)]

Prior to treatment at the TA-16 Burn Ground Unit, the wastes are protected from sources of ignition or reaction. Ignitable or reactive waste is separated and protected from welding activities, hot surfaces, frictional heat, and sources of sparks. Smoking is not allowed within the TA-16 Burn Ground Unit, and a “No Smoking” sign is conspicuously placed at the entrance to the Burn Ground. Together, these measures meet the requirements of 20 NMAC 4.1, Subpart V, 276.17(a) and (b) [1-1-97].

2.2.6 Closure

Should partial closure of the TA-16 Burn Ground Unit become necessary, partial closure activities would include removal of hazardous waste from the structure to be closed and decontamination of any contaminated structures and equipment. Closure will minimize the need for further maintenance, preclude the release of hazardous waste or constituents to environmental media, and be protective of human health. Detailed closure procedures for the TA-16 Burn Ground Unit are addressed in Attachment F.2 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.111 [1-1-97].

2.2.7 Control of Run-On and Runoff

The TA-16-388 Flash Pad and Burn Tray are equipped with retractable covers and secondary containment to prevent run-on and runoff. The TA-16-399 Burn Tray is equipped with a movable cover to prevent run-on into this structure. The TA-16-401 and TA-16-406 Sand Filters are both equipped with lids and are connected to the HE Wastewater Treatment Facility, which eliminates the potential for runoff from these structures.

A Storm Water Pollution Prevention (SWPP) Plan has been developed for the TA-16 Burn Ground. The plan is designed to identify any potential pollutants and to provide pollution prevention or control methods to prevent the discharge of pollutants in storm water runoff at the Burn Ground and the surrounding area. Under the SWPP Plan, the facility is required to implement best management practices to reduce the likelihood of pollutants entering the storm water discharges. The plan includes storm water run-on/runoff measures for active units as well as erosion control (e.g., rock check dams) to prevent dispersion of legacy contamination (see Figure A-13 in Attachment A).

2.3 RECORDKEEPING REQUIREMENTS

Recordkeeping requirements applicable to the TA-16-88 CSU and the TA-16 Burn Ground Unit consist of the biennial report, unmanifested waste report, and additional reports. These reports are discussed in the following sections.

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2.3.1 Biennial Report [20 NMAC 4.1, Subpart V, 264.75]

LANL will prepare and submit a biennial report to the New Mexico Environment Department (NMED) by March 1 of each even-numbered year. The biennial report will be submitted to the

NMED on EPA Form 8700-13B (revised July 1997 or update). The report will cover facility activities during the previous calendar year and will include:

- The EPA identification number, name, and address of the facility;
- The calendar years covered by the report;
- A description and the quantity of each hazardous waste the facility received during the year;
- The method of treatment, storage, or disposal for each hazardous waste;
- For generators who treat, store, or dispose of hazardous waste on site, a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated;
- For generators who treat, store, or dispose of hazardous waste on site, a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent such information is available for the years prior to 1984; and
- The certification signed by LANL or an authorized representative.

2.3.2 Unmanifested Waste Report [20 NMAC 4.1, Subpart V, 264.76]

Waste from off-site sources may be accepted on a limited basis at LANL provided that such waste is properly characterized and manifested and meets the requirements listed in Section 2.1.5 of the LANL General Part B (LANL, 1998a). If LANL accepts any wastes for treatment or storage from an off-site facility without an accompanying manifest, or without an accompanying shipping paper as described in 20 NMAC 4.1, Subpart V, 264.76 [1-1-97], LANL will prepare and submit an Unmanifested Waste Report (EPA Form 8700-131B) to the NMED within fifteen days after receiving the waste. The report will include the following:

- The EPA identification number, name, and address of the facility;
- The date the facility received the waste;
- A description and the quantity of each unmanifested hazardous waste a facility received;
- The method of treatment, storage, or disposal for each hazardous waste;
- The certification signed by LANL or an authorized representative; and
- A brief explanation of why the waste was unmanifested, if known.

2.3.3 Additional Reports [20 NMAC 4.1, Subpart V, 264.77]

In accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.77 [1-1-97], LANL will also report the following to the NMED:

- X Releases and unanticipated fires and explosions that require implementation of the contingency plan, as specified in 20 NMAC 4.1, Subpart V, 264.56(j) [1-1-97]
- X Facility closures, as specified in 20 NMAC 4.1, Subpart V, 264.115 [1-1-97]
- X As otherwise required by 20 NMAC 4.1, Subpart V, Part 264, Subparts F, BB, and CC [1-1-97].

3.0 OTHER FEDERAL LAWS

A discussion of federal laws, as required by the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart IX, 270.3 and 270.14(b)(20), revised January 1, 1997, is provided in Section 3.0 of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (LANL, 1998a).

4.0 CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

This section describes selected solid waste management units (SWMU) that have been identified at Technical Area (TA) 16 at Los Alamos National Laboratory (LANL). Because TA-16 encompasses a relatively large area and contains a large number of SWMUs, this section addresses only those SWMUs that are in the proximity of the hazardous waste management units included in this Part B permit renewal document. Information on the remaining SWMUs at TA-16 is contained in Revision 1.0 of LANL's "Solid Waste Management Units Report" (LANL, 1990), hereinafter referred to as the 1990 SWMU Report, and in the "RFI Work Plan for Operable Unit 1082," (LANL, 1993). The information in this section is being submitted in response to regulatory requirements in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(d), revised January 1, 1997 [1-1-97].

LANL uses the definition of a SWMU presented in "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515" (U.S. Environmental Protection Agency [EPA], 1994), referred to as Module VIII. This definition states that SWMUs are "any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at or around a facility at which solid wastes have been routinely and systematically released."

4.1 SWMU DESCRIPTIONS

Several types of SWMUs are present at TA-16. These SWMUs include those identified for corrective actions in Module VIII, as modified following a Class III permit modification effective December 23, 1998 (New Mexico Environment Department [NMED], 1998); and SWMUs that are active hazardous waste management units. Descriptions of the SWMUs identified for corrective action in Module VIII and those that are active units are presented below. These descriptions were compiled from the "RFI Work Plan for Operable Unit 1082" and from the 1990 SWMU Report. Brief unit and waste descriptions are also provided in Table 4-1. Figures 4-1 and 4-2 show the locations of the selected SWMUs in the vicinity of the TA-16-88 container storage unit and in the vicinity of the TA-16 Burn Ground Unit, respectively.

4.1.1 Open Burn/Open Flash Structures

TA-16-386 is an inactive flash pad at the TA-16 Burn Ground. The flash pad, identified as SWMU No. 16-010(a) in Module VIII, was built in 1951 and measures 100 feet (ft) long by 100 ft wide. It was formerly used to burn high-explosives (HE)-contaminated equipment and waste HE, but is currently used as a less-than-90-day storage area (LANL, 1990; LANL, 1993).

TA-16-387 is a flash pad that was constructed in 1951. The TA-16-387 flash pad will undergo closure as part of closure activities at Material Disposal Area (MDA) P. A closure plan for TA-16-387 has been submitted to the NMED. The pad/burn area consists of a layer of sand several inches thick in a 100-ft by 100-ft fenced area. The pad was used for flash burning HE-contaminated material under 20 NMAC 4.1, Subpart VI [1-1-97], requirements. The unit is identified as SWMU No. 16-010(b) in Module VIII.

The TA-16-388 Flash Pad/Burn Tray and the TA-16-399 HE Burn Tray are active hazardous waste management unit structures that currently operate under the requirements of 20 NMAC 4.1, Subpart VI [1-1-97], and are two of the TA-16 Burn Ground Unit structures for which this Part B permit renewal document is being submitted. TA-16-388 and TA-16-399 are identified as SWMU Nos. 16-010(c) and 16-010(d), respectively, in Module VIII. TA-16-388 and TA-16-399 were described as burn pads in the 1990 SWMU Report. These 100-ft-long by 100-ft-wide enclosed areas each consisted of a concrete pad, used for unloading explosives, and an elevated metal tray. Each burn tray was 2 ft above the ground and 16-ft long by 4-ft wide. HE was placed on the tray and burned. Each tray had a metal-covered rain guard that could be rolled back to expose the tray. Currently, TA-16-399 is operating as an HE burn tray; TA-16-388 has been converted into a flash pad/burn tray area.

TA-16-392 is a former filter bed that was constructed in 1951. The unit was converted to a burn pad in 1988 for the purpose of burning suspected uranium-contaminated objects (LANL, 1993). The unit, including its associated drainage, is identified as SWMU No. 16-010(i) in Module VIII.

4.1.2 Filter Beds/Filter Vessels

The former location of a filter bed (TA-16-393) is identified as SWMU No. 16-005(g) in Module VIII. The unit received HE-residue washwater from the basket wash facility (see Section 4.1.5) and drained the filtered washwater to an adjacent area. TA-16-393 was decommissioned and removed in 1965.

TA-16-394 was a filter bed built in 1951 to receive HE-residue washwater from the basket wash facility. A pipe drained the filtered washwater to the adjacent area southeast of the bed. The filter bed

was later modified to consist of a 12-ft-long by 12-ft-wide by 1-ft-deep metal tray filled with 6 to 8 inches of sand. This burn tray contained two elevated shallow steel pans. Oil and solvents contaminated with HE were poured into the trays and burned. This burn tray no longer operates and is identified as SWMU No. 16-010(j) in Module VIII. TA-16-394 burn tray operations have been relocated to the TA-16-388 Flash Pad/Burn Tray area and the TA-16-394 burn tray will undergo closure. A closure plan for TA-16-394 has been submitted to the NMED.

TA-16-401 and TA-16-406 are steel filter vessels at the TA-16 Burn Ground. These active hazardous waste management unit structures operate under 20 NMAC 4.1, Subpart VI [1-1-97], requirements and are designated as SWMU Nos. 16-010(e) and 16-010(f), respectively, in Module VIII. They are two of the TA-16 Burn Ground Unit structures for which a permit is being sought through this permit renewal document. SWMU No. 16-010(e) was built in 1961 to filter HE-contaminated washwater from the basket wash facility, TA-16-390. Washwater was carried from the basket wash facility to the filter vessel through a trough (TA-16-1129). This arrangement was used until 1966, when TA-16-390 was decommissioned. The original drainage system carried the filtered water from the filter vessel to a filter/treatment unit (TA-16-363). SWMU No. 16-010(f) replaced filter bed TA-16-393, which was decommissioned and removed in 1965.

4.1.3 Storage Areas

A container storage unit is located at TA-16-88. This active hazardous waste management unit currently operates under 20 NMAC 4.1, Subpart VI [1-1-97] requirements, and is one of the units for which a permit is being sought through this permit renewal document. This container storage unit does not currently have a SWMU number assigned to it. Wastes stored in this container storage unit include solid hazardous and mixed low-level waste.

A storage area was formerly located near or within TA-16-386. Barium nitrate was reportedly placed in the area in the 1940s and remained there until it was removed in the late 1960s (LANL, 1990; LANL, 1993). This area is identified as SWMU No. 16-016(c) in Module VIII.

4.1.4 Septic Tank

TA-16-385 is a septic tank that serves a water closet, a lavatory, and a floor drain at the TA-16 Burn Ground. The septic tank, which was constructed in 1963, is made of steel and has a 385-gallon capacity. Wastes managed at this unit include domestic and industrial sewage. In addition, sampling of TA-16-385 in 1988 revealed the presence of volatile organic compounds (LANL, 1990). The unit is identified as SWMU No. 16-006(e) in Module VIII.

4.1.5 Basket Wash Facility and Associated Structures

A basket wash facility (TA-16-390) was formerly located at TA-16. The building was constructed in 1951 and was used to wash HE-contaminated basket filters collected from sumps. Washwater from the operation was carried to filtering vessels via one of four transfer troughs (see below). Operations at the facility ceased in 1966 and the facility has since been decommissioned (LANL, 1990; LANL, 1993). The unit is designated as SWMU No. 16-010(h) in Module VIII.

TA-16-1129, TA-16-1134, TA-16-1135, and TA-16-1136 are all inactive troughs that formerly carried HE-contaminated or potentially HE-contaminated washwater from the basket wash facility to one of four filtering vessels. The units are identified as SWMU Nos. 16-010(k), 16-010(l), 16-010(m), and 16-010(n), respectively, in Module VIII. Each of the units is a steel, V-shaped trough that is open on the top. The units are supported by a steel frame and elevated approximately 3 ft off the ground. In addition to transporting HE-contaminated or potentially HE-contaminated washwater, SWMU No. 16-010(n) also transported washwater potentially contaminated with uranium (LANL, 1993). SWMU No. 16-010(n) was dismantled in 1988 (LANL, 1993).

4.1.6 Surface Impoundment

SWMU No. 16-008(b) is an inactive surface impoundment at the TA-16 Burn Ground. In operation from around the 1940s until the 1980s, the unit measured 60 ft long, 35 ft wide, and 4 ft deep and received liquid from two filter vessels (TA-16-401 and TA-16-406). The sludge in the surface impoundment contained HE residue, barium sulfate, and barium nitrate (LANL, 1990). The unit underwent closure in 1990. This SWMU is identified in Module VIII.

4.1.7 Disposal Area

MDA P is an inactive, 6.71-acre disposal area located near the south rim of Cañon de Valle and north of TA-16-387 (LANL, 1993). Waste disposal at MDA P began in the early 1950s and continued until 1984. Items disposed of at MDA P include wastes from the synthesis, processing, and testing of HE; photo development process wastes; residues from burning HE-contaminated equipment and debris; debris generated during demolition of S-Site; and barium-contaminated sands generated during HE burning operations (LANL, 1993). Prior to being used as a waste disposal site, the area was used to burn HE detonators. MDA P is identified as SWMU No. 16-018 in Module VIII. A closure plan for MDA P has been submitted to the NMED, and it is currently undergoing closure.

4.2 RELEASES

Some large debris items from MDA P [SWMU No. 16-018] are known to have fallen into Cañon de Valle (LANL, 1993). The extent of contamination in the canyon, if any, is unknown. MDA P is currently undergoing closure, and sampling and analytical data are being collected throughout the closure activities.

4.3 CORRECTIVE ACTIONS

Pursuant to 20 NMAC 4.1, Subpart V, 264.101(a) [1-1-97], corrective actions are required only for releases of hazardous waste or hazardous constituents. Because the SWMUs are located in areas where waste has been historically and is currently managed, they have been investigated and will be remediated, as necessary, with EPA's and NMED's approval. Any corrective action needed at TA-16 will follow the Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study process.

Table 4-1

Technical Area (TA) 16 Solid Waste Management Units (SWMU) Descriptions

SWMU No.	Unit Type	Unit Description	Waste Description
16-005(g)	Filter bed	Former filter bed (TA-16-393) and adjacent area received high-explosives (HE)-contaminated washwater from the basket wash facility. It was decommissioned and removed in 1965.	Hazardous waste
16-006(e)	Septic tank	Septic tank (TA-16-385) that serves a water closet, a lavatory, and a floor drain at the TA-16 Burn Ground.	Hazardous waste and domestic and industrial sewage
16-008(b)	Surface impoundment	Inactive surface impoundment that received liquid waste from two filter vessels (TA-16-401 and 406). The unit underwent Resource Conservation and Recovery Act (RCRA) closure in 1990.	Hazardous waste
16-010(a)	Flash pad	Inactive flash pad (TA-16-386) used to burn HE-contaminated equipment and waste HE. Currently used as less-than-90-day storage area.	Hazardous waste
16-010(b)	Flash pad	Flash pad (TA-16-387) used for flash burning HE-contaminated material under the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart IV, Part 265, requirements. Scheduled for RCRA closure.	Hazardous waste
16-010(c)	Burn pad	Burn pad (TA-16-388) used to burn HE scrap. Has been converted into a flash pad used to treat HE-contaminated material and a burn tray used to burn HE-contaminated solvents.	Hazardous waste
16-010(d)	Burn pad	Burn pad (TA-16-399) with an elevated burn tray used to burn HE scrap.	Hazardous waste
16-010(e)	Filter vessel	Sand filter (TA-16-401) used for filtering HE/water sludge from HE sumps. The residue left in the filter is burned.	Hazardous waste

Table 4-1 (continued)

Technical Area (TA) 16 Solid Waste Management Units (SWMU) Descriptions

SWMU No.	Unit Type	Unit Description	Waste Description
16-010(f)	Filter vessel	Sand filter (TA-16-406) used for filtering HE/water sludge from HE sumps. The residue left in the filter is burned.	Hazardous waste
16-010(h)	Basket wash facility	Basket wash facility (TA-16-390) used to wash HE-contaminated basket filters collected from sumps. Operations ceased in 1966 and facility has been decommissioned.	Hazardous waste
16-010(i)	Filter bed/burn pad	Former filter bed (TA-16-392) converted into a burn pad and used for burning suspected uranium-contaminated objects.	Hazardous and suspected mixed waste
16-010(j)	Filter bed/burn tray	Former filter bed (TA-16-394) modified into a burn tray used to burn HE-contaminated oil and solvents. No longer operates and is scheduled for RCRA closure.	Hazardous waste
16-010(k)	Trough	Inactive trough (TA-16-1129) that formerly carried HE-contaminated or potentially HE-contaminated washwater from the basket wash facility to a filter vessel.	Hazardous waste
16-010(l)	Trough	Inactive trough (TA-16-1134) that formerly carried HE-contaminated or potentially HE-contaminated washwater from the basket wash facility to a filter vessel.	Hazardous waste
16-010(m)	Trough	Inactive trough (TA-16-1135) that formerly carried HE-contaminated or potentially HE-contaminated washwater from the basket wash facility to a filter vessel.	Hazardous waste
16-010(n)	Trough	Inactive trough (TA-16-1136) that formerly carried HE-contaminated or potentially HE-contaminated washwater from the basket wash facility to a filter vessel. Also carried washwater potentially contaminated with uranium. The trough was dismantled in 1988.	Hazardous and suspected mixed waste

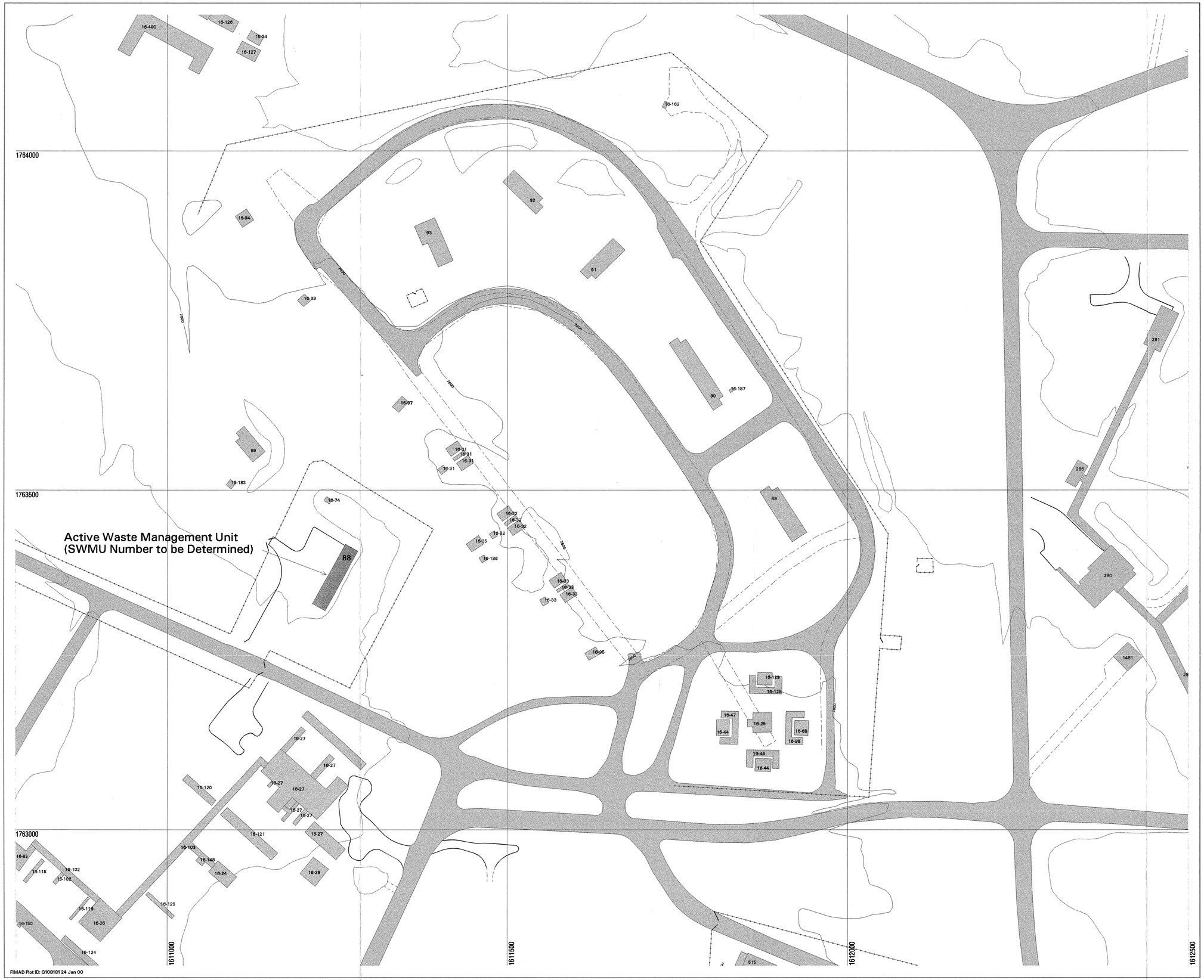
Table 4-1 (continued)

Technical Area (TA) 16 Solid Waste Management Units (SWMU) Descriptions

SWMU No.	Unit Type	Unit Description	Waste Description
16-016(c)	Storage area	Barium nitrate storage area located near or within TA-16-386. Barium nitrate was removed in the late 1960s.	Hazardous waste
16-018	Disposal area	Material Disposal Area P (inactive) located near the south rim of Cañon de Valle and to the north of TA-16-387.	Hazardous waste
TBD[a]	Container storage	Container storage located in TA-16, Building 88	Hazardous and mixed low-level waste

[a] TBD = To be determined.

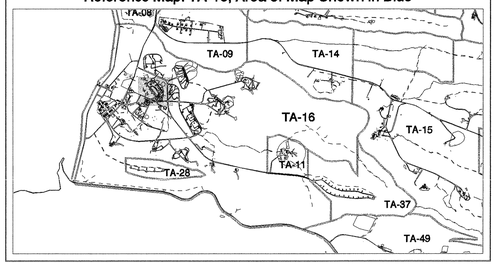
Figure 4-1: Solid Waste Management Unit (SWMU) in the Vicinity of Building 88 at Technical Area (TA) 16



Boundary, TA
Contours, 10 foot
Contours, 100 foot
Fence, Industrial
Fence, Security
SWMU Boundary
Roads, Dirt
Roads, Paved
Road/Trail
Former Structure
Permanent Structure
Temporary Structure
Structure TA-16-88

6214-A

Reference Map: TA-16, Area of Map Shown in Blue



N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 70

SCALE 1:840

0 21 42 63 84

METERS

0 70 140 210 280

FEET

Notice: The information on this map is provisional and the accuracy has not been confirmed. Feature locations are dependent on scale and symbology and should not be relied upon to establish legal claims. Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

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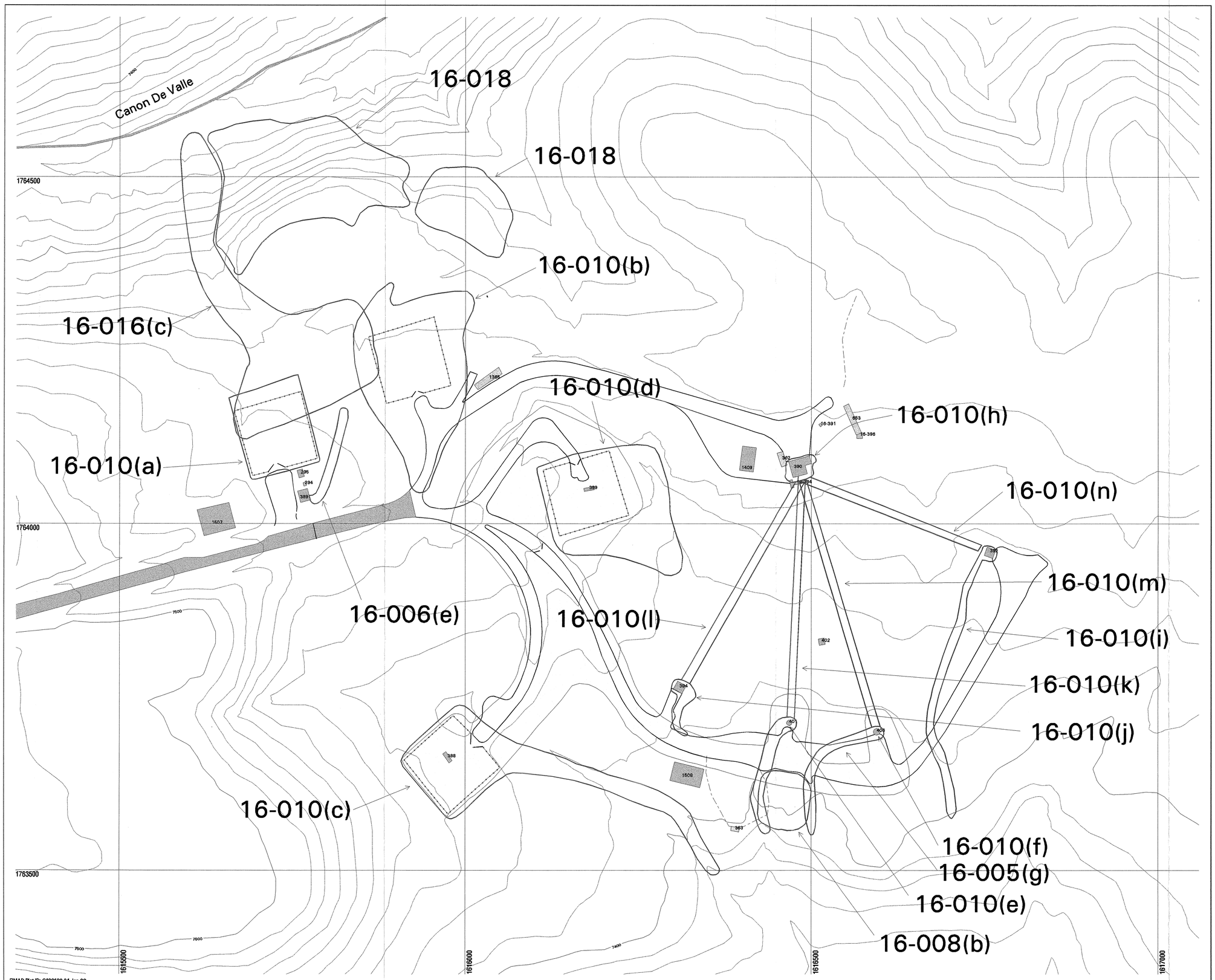
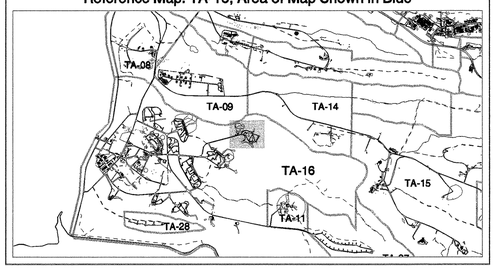
Figure 4-2: Solid Waste Management Units (SWMU) in the Vicinity of the Burn Ground Unit at Technical Area (TA) 16



Boundary, TA
Contours, 10 foot
Contours, 100 foot
Fence, Industrial
Fence, Security
SWMU Boundary
Roads, Dirt
Roads, Paved
Road/Trail
Hazardous Waste Management Unit Boundary
Former Structure
Permanent Structure
Temporary Structure

6214-B

Reference Map: TA-16, Area of Map Shown in Blue



N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 500
Feet per inch on map = 70

SCALE 1:840

0 21 42 63 84

METERS

0 70 140 210 280

FEET

Notice: The information on this map is provisional and the accuracy has not been confirmed. Feature locations are dependent on scale and symbology and should not be relied upon to establish legal claims. Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

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Produced by: Marcia Jones

Date: January 24, 2000 GIS Plot ID: G108180

5.0 CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Dennis J. Erickson
Division Director for Environment, Safety, and Health Division
Los Alamos National Laboratory
Operator

Date Signed

David A. Gurulé, P.E.
Area Manager, Los Alamos Area Office
U.S. Department of Energy
Albuquerque Operations
Owner/Operator

Date Signed

CERTIFICATION
Los Alamos National Laboratory
Technical Area 16 Part B Permit Renewal Document
January 2000

CERTIFICATION BY TECHNICAL AREA (TA) 16 REPRESENTATIVES

I certify under penalty of law that this document and attachments were reviewed and approved for consistency with the waste management operations of the Engineering Sciences and Applications (ESA) Division in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for reviewing, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete as it applies to ESA operations at TA-16. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Earle Marie Hanson
Division Director for ESA Division
Los Alamos National Laboratory

Date Signed

Ricardo V. Ortiz
Group Leader for ESA Weapon Materials
and Manufacturing Group
Los Alamos National Laboratory

Date Signed

Steven P. Girrens
Group Leader for ESA Engineering Analysis Group
Los Alamos National Laboratory

Date Signed

6.0 REFERENCES

EPA, 1998, 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, 1998a, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1996, "RCRA Part B Permit Application: Technical Area 16; Building 88, Container Storage Area; Flash Pads 387 and 388, Open Burn Units; Burn Pads 388 and 399, Open Burn Units; Burn Trays 388 and 394, Open Burn Units; and Filter Vessels 401 and 406, Open Burn Units," Revision 2.1, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1995, "RCRA Part B Permit Application: Technical Area 16; Building 88, Container Storage Area; Flash Pads 387 and 388, Open Burn Units; Burn Pads 388 and 399, Open Burn Units; Burn Trays 388 and 394, Open Burn Units; and Filter Vessels 401 and 406, Open Burn Units," Revision 2.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1993, "RFI Work Plan for Operable Unit 1082," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1990, "Solid Waste Management Units Report," Revision 1.0, LAUR 90-3400, Los Alamos National Laboratory, Los Alamos, New Mexico.

NMED, 1998, "Approval: Class III Permit Modification to Remove Ninety-Nine (99) Solid Waste Management Units from the Department of Energy/Los Alamos National Laboratory RCRA Permit NM0890010515," effective December 23, 1998, New Mexico Environment Department, Hazardous and Radioactive Materials Bureau.

ATTACHMENT A

FACILITY DESCRIPTION

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LIST OF ABBREVIATIONS/ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
CSU	container storage unit
HE	high explosives
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
RCRA	Resource Conservation and Recovery Act
TA	technical area

ATTACHMENT A
FACILITY DESCRIPTION

The information provided in this attachment is submitted in accordance with the applicable requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1) [1-1-97]. The following subject areas are addressed in this attachment:

- X A general description of Technical Area (TA) 16 at Los Alamos National Laboratory (LANL) [20 NMAC 4.1, Subpart IX, 270.14(b)(1)];
- X Site-specific traffic patterns, volume, and control [20 NMAC 4.1, Subpart IX, 270.14(b)(10)];
- X Site-specific location information for compliance with seismic and floodplain standard requirements [20 NMAC 4.1, Subpart IX, 270.14(b)(11), and 20 NMAC 4.1, Subpart V, 264.18(a) and (b)];
- X Site-specific topographic map requirements [20 NMAC 4.1, Subpart IX, 270.14(b)(19)];
- X Site-specific groundwater monitoring and protection information [20 NMAC 4.1, Subpart IX, 270.14(c), and 20 NMAC 4.1, Subpart V, 264.90(a)].

A LANL-wide facility description addressing additional regulatory requirements is provided in Appendix A of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (LANL, 1998a), hereinafter referred to as the LANL General Part B.

A.1 TA-16 GENERAL DESCRIPTION [20 NMAC 4.1, Subpart IX, 270.14(b)(1)]

TA-16 is located in the southwestern portion of LANL (Figure A-1). It is situated on a broad mesa that is bounded on the north by Cañon de Valle; on the south by State Road 4 and Bandelier National Monument; and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevation ranges from approximately 7,700 feet at the west end of the TA to approximately 6,800 feet at the lower east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops.

The waste management units at TA-16 include a container storage unit (CSU) located inside Building 88 (Figures A-2 and A-3) and the TA-16 Burn Ground Unit (Figures A-4 and A-5) at TA-16. The CSU is for storage and handling of solid hazardous and mixed low-level waste. The TA-16 Burn Ground Unit is comprised of the following structures: the TA-16-388 Flash Pad/Burn Tray,

where high explosives (HE) contamination is removed from excess equipment or scrap and where HE-contaminated liquids are burned, respectively; the TA-16-399 HE Burn Tray, used for the destruction of solid HE material; and the TA-16-401 and TA-16-406 Sand Filters, used for filtration of HE wastewater and burning of particulate HE. Descriptions of these two waste management units are provided in Section 2.0, Attachment G, and Attachment H of this permit renewal document.

A.2 TRAFFIC PATTERNS [20 NMAC 4.1, Subpart IX, 270.14(b)(10)]

General traffic pattern information, traffic volumes, and traffic control signals for the LANL-wide facility are provided in Appendix A of the LANL General Part B (LANL, 1998a).

A.2.1 Routes of Travel

The primary traffic routes that may be used to transport hazardous and mixed waste to or from the TA-16-88 CSU and to transport hazardous waste to or from the TA-16 Burn Ground Unit include Pajarito Road, Trinity Drive (State Road 502), Diamond Drive, West Jemez Road (State Road 501), Anchor Ranch Road, K-Site Road, State Road 4, and East Jemez Road (Figure A-6).

A.2.2 Traffic Volumes

Due to the nature of operations at TA-16 and because the TA is in a secured area, traffic volume in the area of the TA-16-88 CSU is generally light and the traffic volume in the area of the Burn Ground Unit is kept to an absolute minimum to conduct safe treatment operations. Vehicle types are generally cars, light- and medium-duty trucks, vans, tank trucks, dump trucks, and sometimes forklifts and cranes. At TA-16-88, vehicles are parked adjacent to or near the building. At the TA-16 Burn Ground, vehicles may be parked next to the Control Building (TA-16-389), driven on the TA-16 Burn Ground roads, or parked adjacent to the Burn Ground Unit structures.

A.2.3 Traffic Control Signals

Traffic control signals within TA-16 include stop signs, posted speed limits, and other traffic and pedestrian control signs. The locations of existing signs in the vicinity of the TA-16-88 CSU and the TA-16 Burn Ground Unit are shown on Figure A-7.

A.2.4 Road Surfacing and Load Bearing Capacity

Roads within TA-16 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-thick base overlain with a 3-inch-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

A.3.1 Seismic Standard [20 NMAC 4.1, Subpart IX, 270.14(b)(11)(i and ii) and 20 NMAC 4.1, Subpart V, 264.18(a)]

The hazardous and mixed waste management units at TA-16 are exempt from the seismic standards in 20 NMAC 4.1, Subpart IX, 270.14(b)(11), and 20 NMAC 4.1, Subpart V, 264.18(a) [1-1-97], because the structures existed prior to November 19, 1980, and July 25, 1990, the effective dates of regulation for hazardous and mixed waste, respectively.

A.3.2 Floodplain Standard [20 NMAC 4.1, Subpart IX, 270.14(b)(11)(iii) and 270.14(b)(19)(ii); 20 NMAC 4.1, Subpart V, 264.18(b)]

In accordance with 20 NMAC 4.1, Subpart IX, 270.14(b)(11)(iii) [1-1-97], it has been determined that the hazardous and mixed waste management units addressed in this permit renewal document are not located within the 100-year floodplain boundary. LANL has mapped all 100-year floodplain boundaries within the LANL complex, as required in AModule VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515" (U.S. Environmental Protection Agency, 1994). A report has been published documenting the floodplain mapping procedures (McLin, 1992). This report, which demonstrates that the units at TA-16 are not within the 100-year floodplain, is included as Supplement 5 of the LANL General Part B (LANL, 1998a).

A.4 TOPOGRAPHIC MAPS [20 NMAC 4.1, Subpart IX, 270.14(b)(19)]

Topographic maps and figures are provided herein or referenced to meet the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(19) [1-1-97]. The maps include the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- X A LANL-wide 100-year floodplain map is provided on page 36 of the report included as Supplement 5 of the LANL General Part B (LANL, 1998a).
- X A map showing surface waters, including intermittent streams, near the TA-16-88 CSU and the TA-16 Burn Ground Unit, is included as Figure A-8.

X Surrounding land uses are shown on Figure A-1.

X Wind roses for TA-6 and TA-49, the locations of the closest wind observation towers to TA-16, are shown on Figures A-9 and A-10.

X A map showing the legal boundaries of LANL (including TA-16) is provided as Map 1 in the ALos Alamos National Laboratory General Part A Permit Application,≅ Revision 0.0 (LANL, 1998b), hereinafter referred to as the LANL General Part A.

X Access control features for TA-16 (e.g. fences, gates) are shown on Figure A-11.

X A map showing supply wells, monitoring wells, test wells, springs, and surface-water sampling stations near TA-16 is included as Figure A-8.

X The locations of buildings, hazardous and/or mixed waste management units and structures, and loading and unloading areas at TA-16 are shown on Figure A-8.

X A map showing National Pollutant Discharge Elimination System discharge structure locations is included in the LANL General Part A (LANL, 1998b).

X Storm, sanitary, and process sewer systems at LANL are shown on Map A-1 of the LANL General Part B (LANL, 1998a).

X Digital elevation model drainage features for TA-16-88 are shown on Figure A-12. Drainage control features at the TA-16 Burn Ground are shown on Figure A-13.

X Fire stations serving LANL and the County of Los Alamos are shown on Figure E-2 of Appendix E in the LANL General Part B (LANL, 1998a).

X The equipment cleanup area for LANL is located at TA-50-1. The location of TA-50-1 is shown on a map in the LANL General Part A (LANL, 1998b).

Contour lines on all topographic maps are in intervals sufficient to detail natural drainage at LANL and in the vicinity of the waste management unit(s). As provided in 20 NMAC 4.1, Subpart IX, 270.14(b)(19) [1-1-97], 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 NMAC 4.1, Subpart IX, 270.14(c) and 20 NMAC 4.1, Subpart V, 264.90(a)]

Groundwater monitoring information is provided in Appendix A of the LANL General Part B (LANL, 1998a).

A.6 OTHER PERMIT ACTIVITIES

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

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

TA-16 had a permit for a hazardous waste incinerator located at the TA-16 Burn Ground. This incinerator is no longer active and is in the process of undergoing RCRA closure. LANL does not wish to renew this permit.

A.7 REFERENCES

AASHTO, 1996, AStandard Specifications for Highway Bridges,≅ 16th Edition, American Association of State Highway and Transportation Officials.

LANL, 1998a, ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, ALos Alamos National Laboratory General Part A Permit Application,≅ Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

McLin, 1992, ADetermination of 100-Year Floodplain Elevations at Los Alamos National Laboratory,≅ LA-12195-MS, Los Alamos National Laboratory, Los Alamos, New Mexico.

U. S. Environmental Protection Agency, 1994, AModule VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory, EPA I.D. NM0890010515.≅

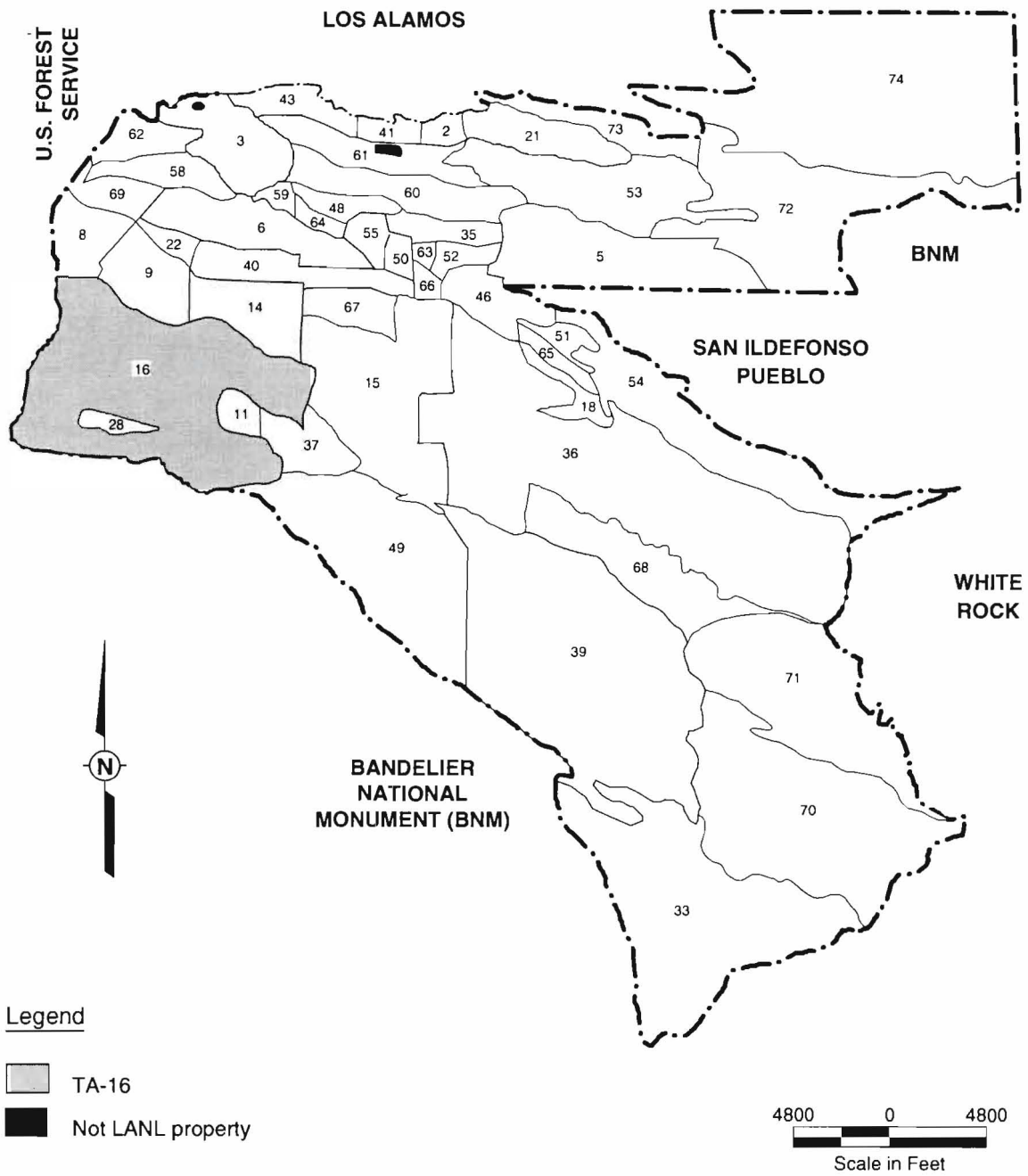


Figure A-1
Location Map of Technical Area (TA) 16 at Los Alamos National Laboratory (LANL)

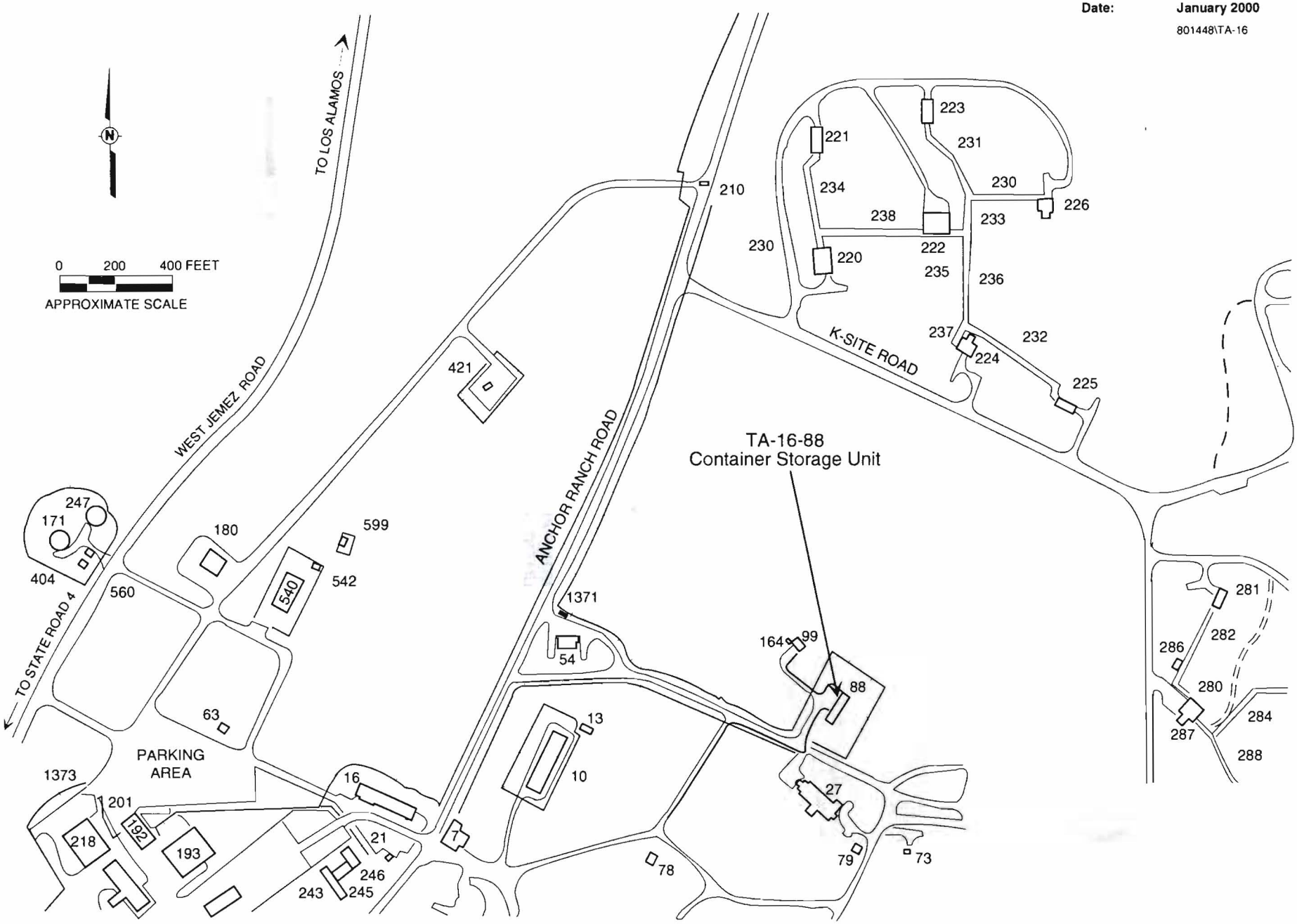


Figure A-2
Site Location Map for Technical Area (TA) 16, Building 88

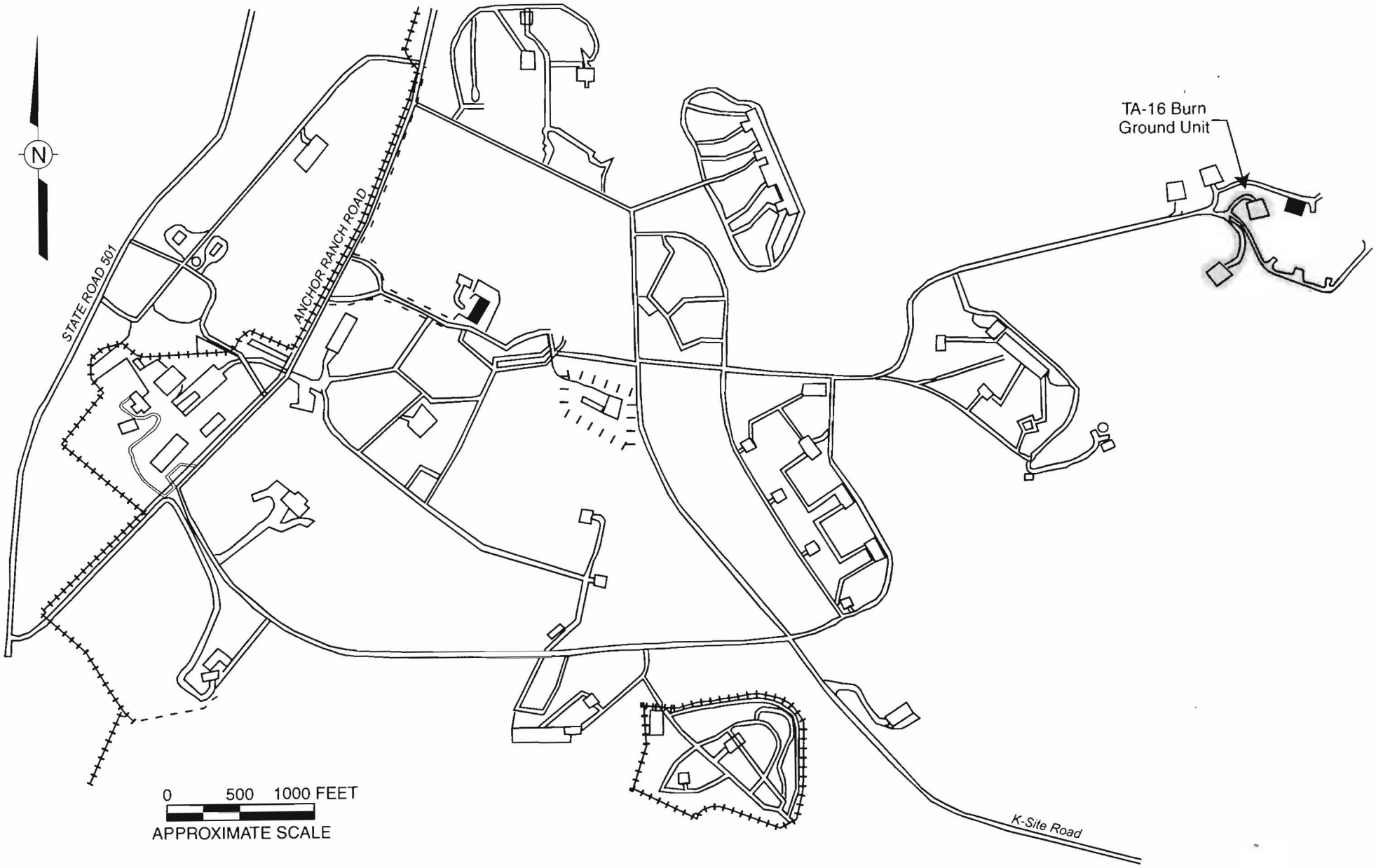


Figure A-4
Site Location Map for Technica a (TA) 16 Burn Ground Unit

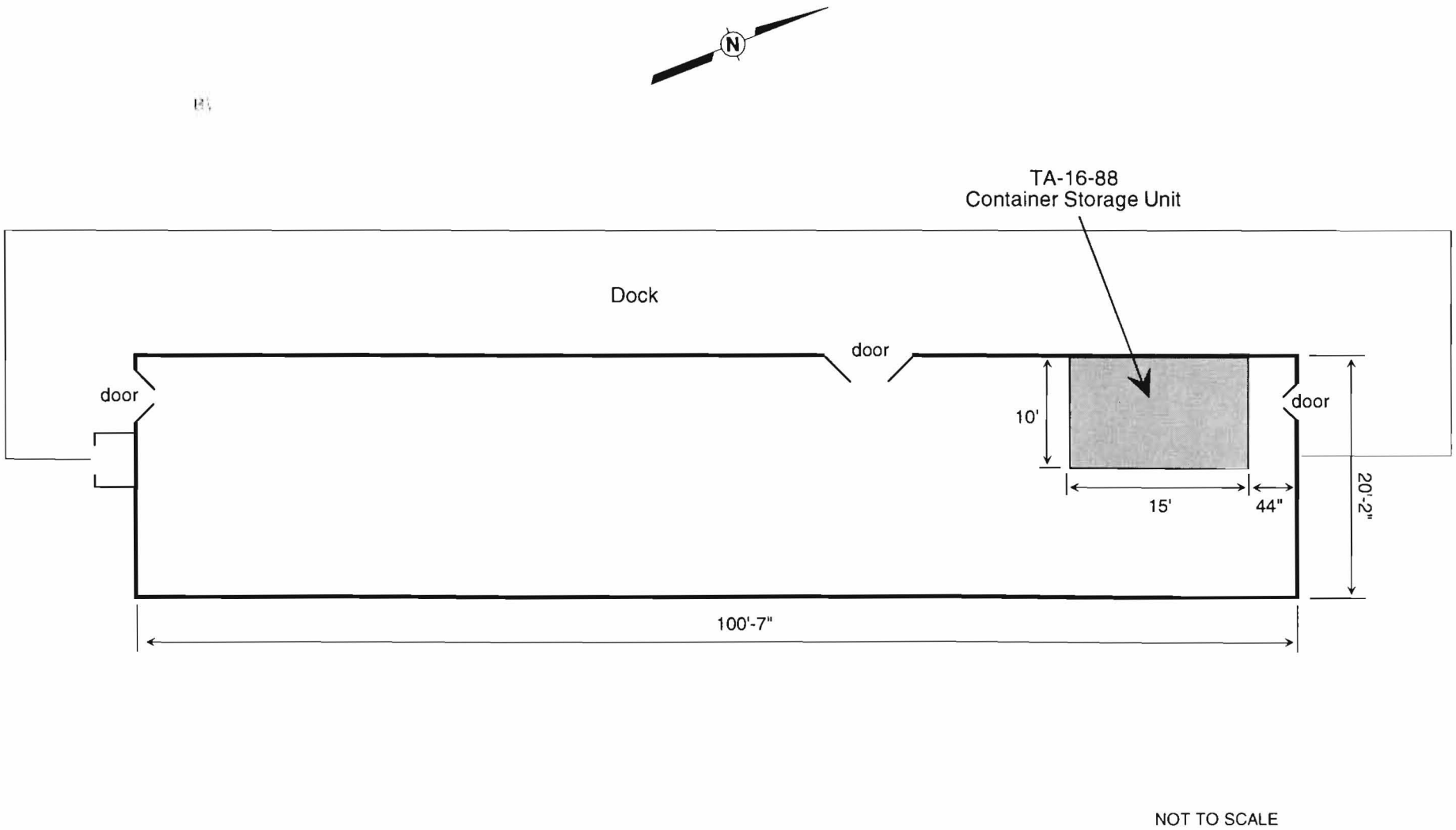


Figure A-3
Technical Area (TA) 16, Building 88, Container Storage Unit

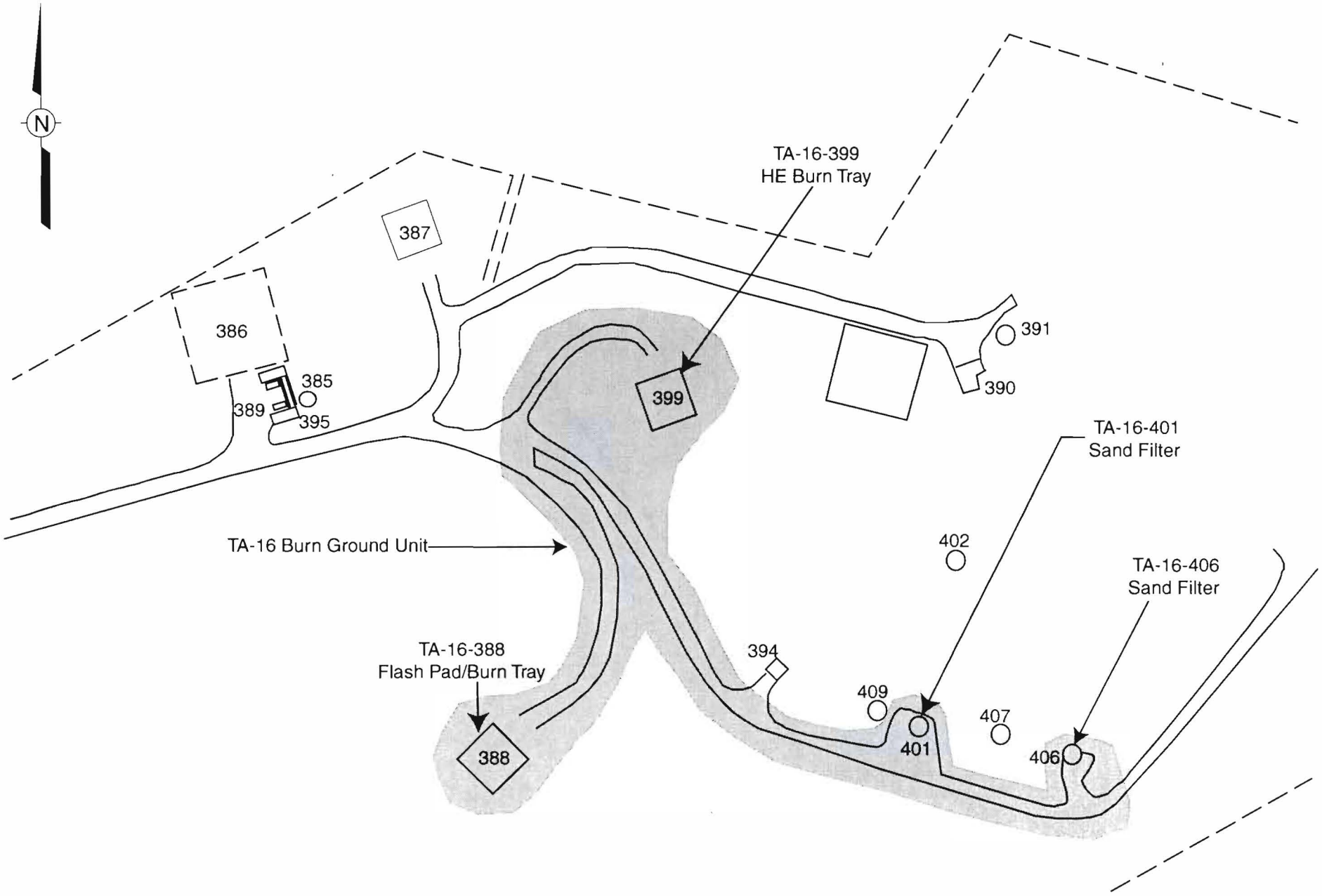


Figure A-5
Technical Area (TA) 16 Burn Ground Unit

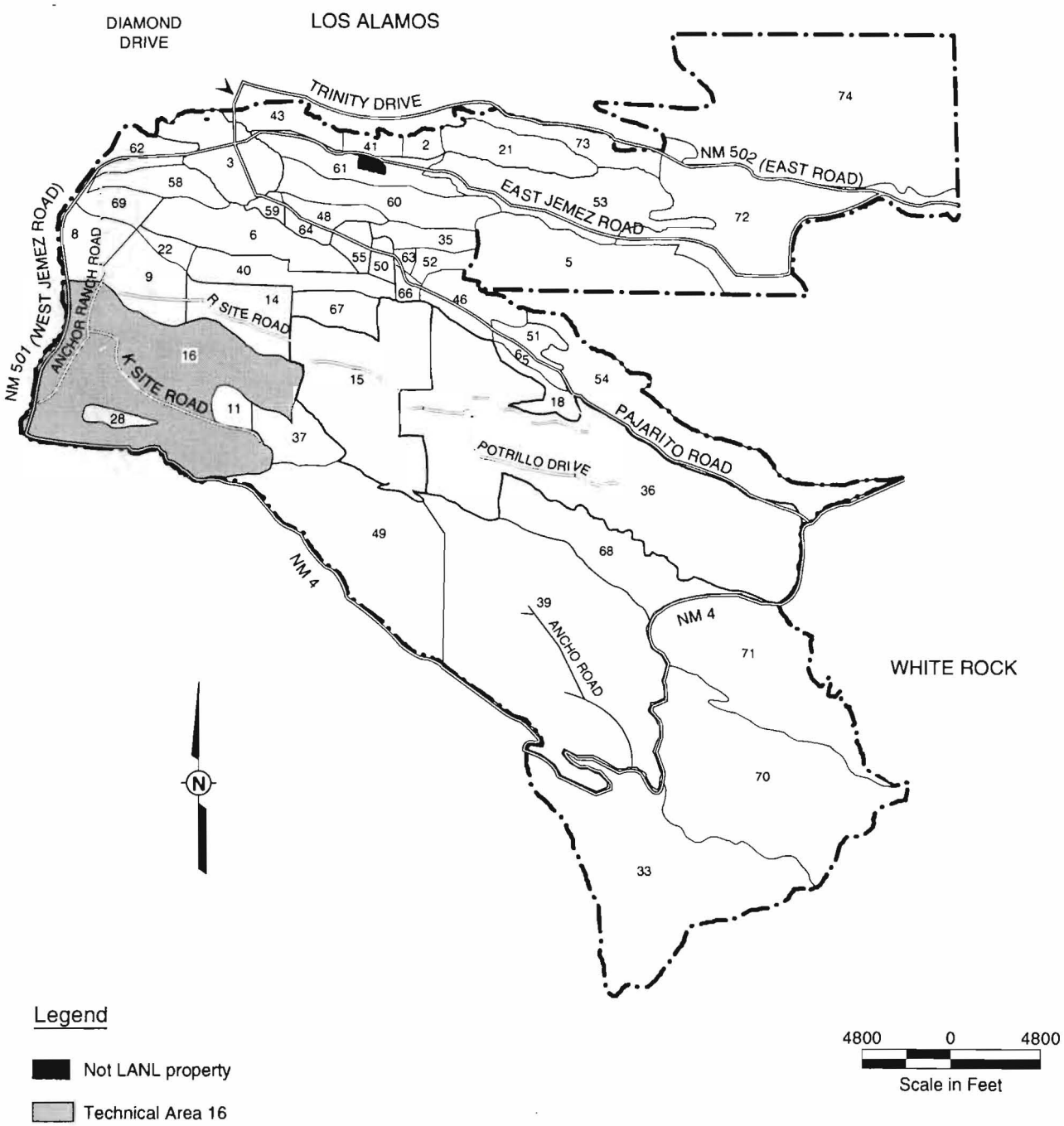


Figure A-6
Major Roads at Los Alamos National Laboratory (LANL)

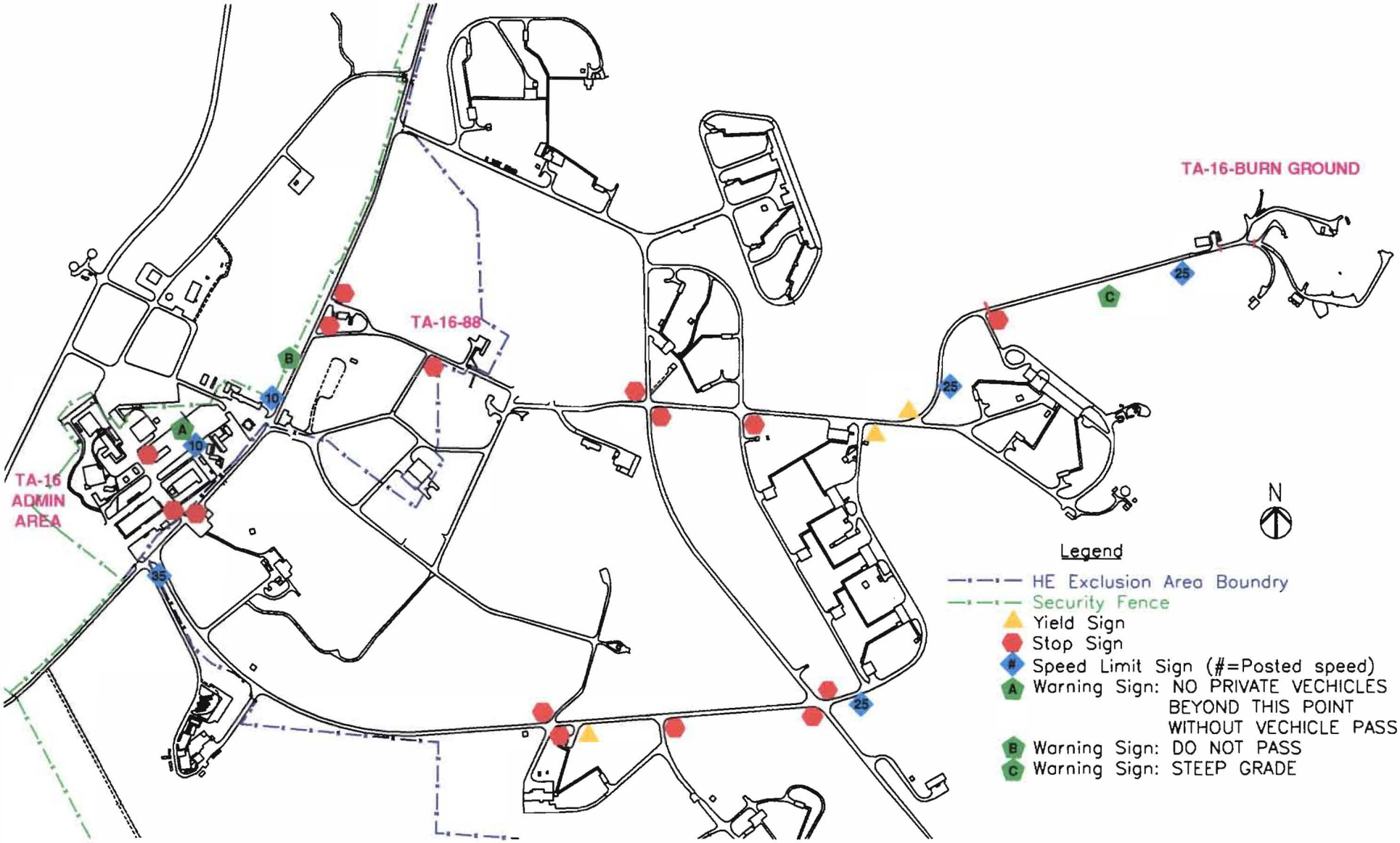
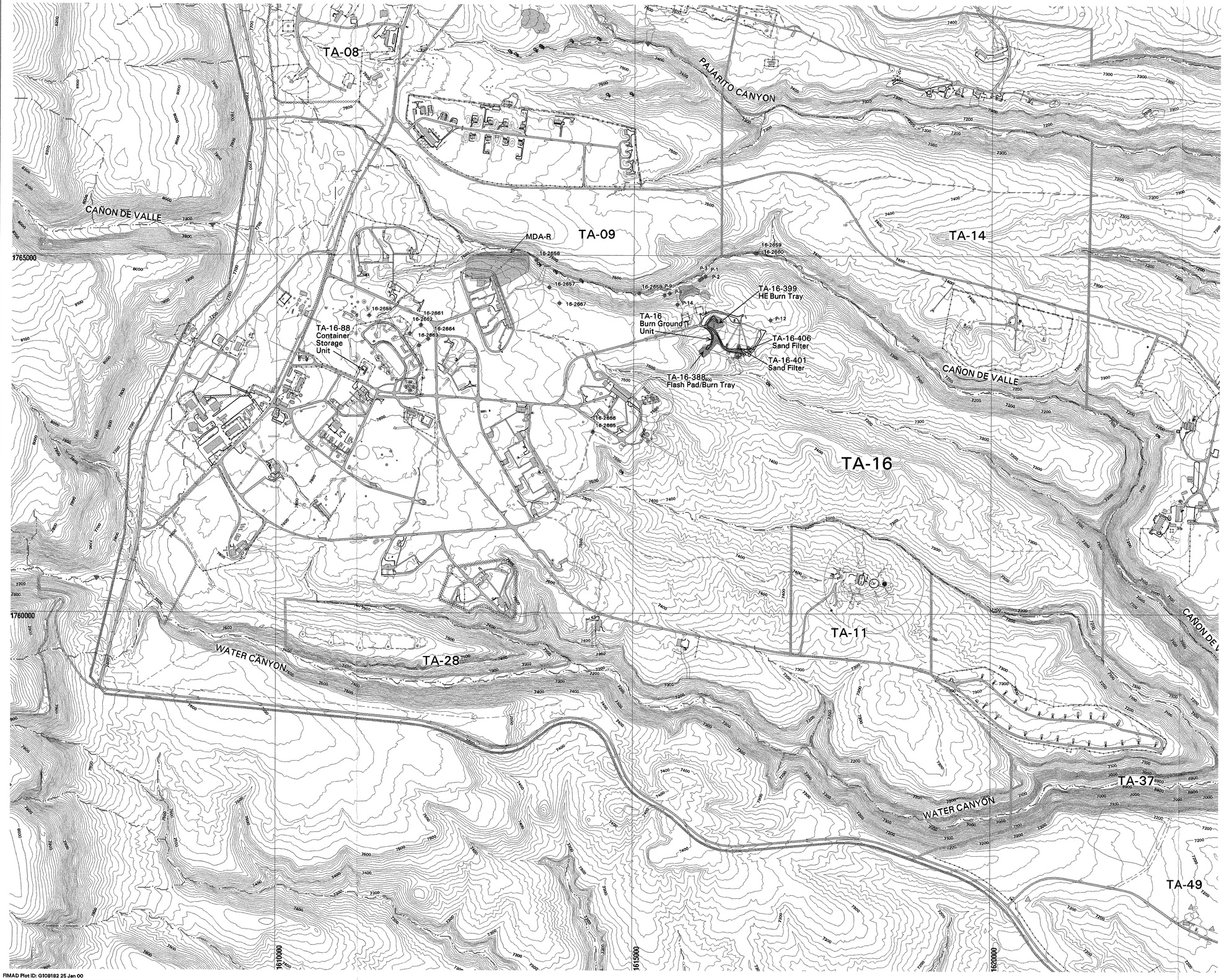


Figure A-7

Location Map of Access Roads and Traffic Control Signs in the Vicinity of Technical Area (TA) 16, Building 88 and the Burn Ground



FIMAD Plot ID: G108182 25 Jan 00

Map A-8: Contour Map Showing the Location of the Hazardous and Mixed Waste Units at Technical Area (TA) 16

- Boundary, Los Alamos National Laboratory
- Boundary, TA
- Contours, 10 foot
- Contours, 100 foot
- Fence, Industrial
- Fence, Security
- Solid Waste Management Unit (SWMU) Boundary
- Roads, Dirt
- Roads, Paved
- Road/Trail
- Stream, Intermittent
- Stream, Perennial
- Hazardous Waste Management Unit
- Material Disposal Area
- Former Structure
- Permanent Structure
- Temporary Structure
- Structure with Treatment, Storage, or Disposal (TSD) Area(s)

PERCHED ALLUVIAL MONITORING WELLS
(Old wells are pre-1990, new wells installed since 1990 according to EPA guidelines)

- New Dry Well
- Old Dry Well
- New Saturated Well
- Old Saturated Well

MAIN AQUIFER WELLS

- Water Supply Well
- Test Well

OTHER

- Abandoned/Plugged Well
- LAOR Well
- Other Monitoring Well

- Surface Water Sampling Station
- Spring

6214-C

N

State Plane Coordinate System, New Mexico Central Zone.
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 5000
Feet per inch on map = 700

SCALE 1:8400

0 213 426 639 852
METERS

0 700 1400 2100 2800
FEET

Notice: The information on this map is provisional and the accuracy has not been confirmed. Feature locations are dependent on scale and symbology and should not be relied upon to establish legal claims. Basemap Sources: Boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data is from Los Alamos National Laboratory Environmental Restoration Program aerial survey, September 1991.

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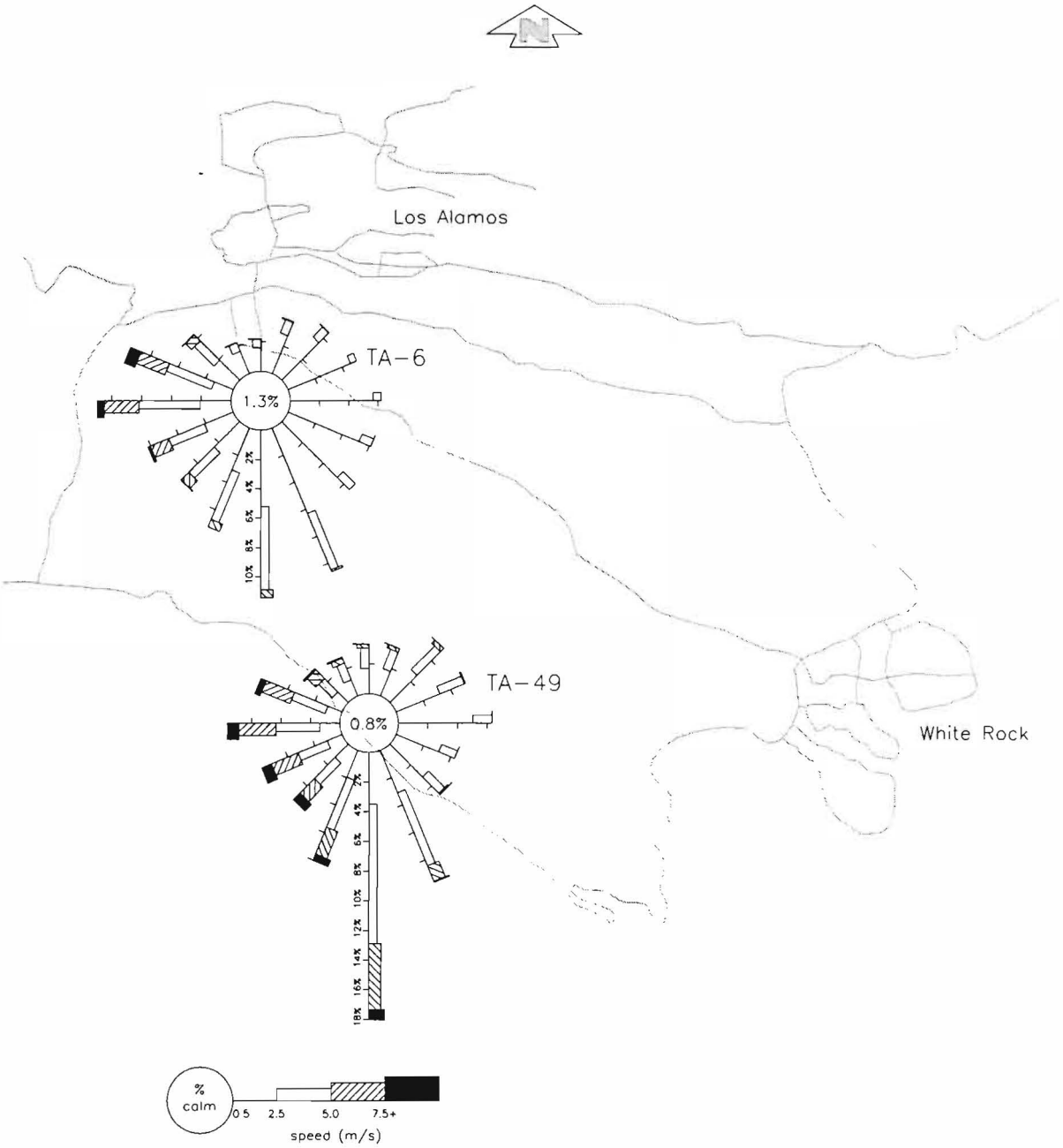
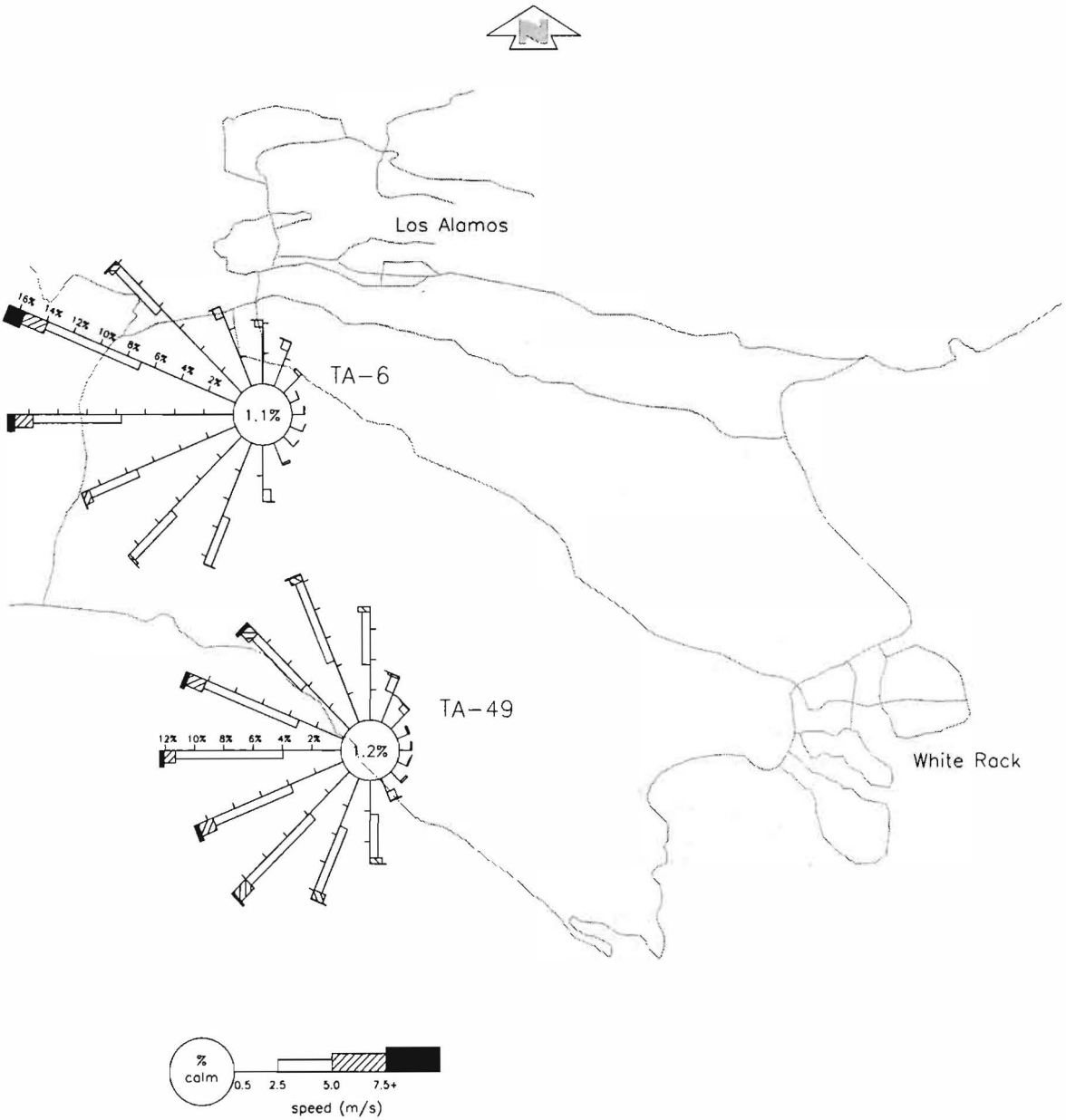
Produced by: Marcia Jones
Date: January 25, 2000 GIS Plot ID: G108182



Modified from: "Environmental Surveillance and Compliance at Los Alamos During 1996," 1997, LA-13343-ENV, Los Alamos National Laboratory, Los Alamos, New Mexico.

Figure A-9
Annual Wind Roses for Los Alamos National Laboratory--Day



Modified from: "Environmental Surveillance and Compliance at Los Alamos During 1996," 1997, LA-13343-ENV, Los Alamos National Laboratory, Los Alamos, New Mexico.

Figure A-10
Annual Wind Roses for Los Alamos National Laboratory--Night

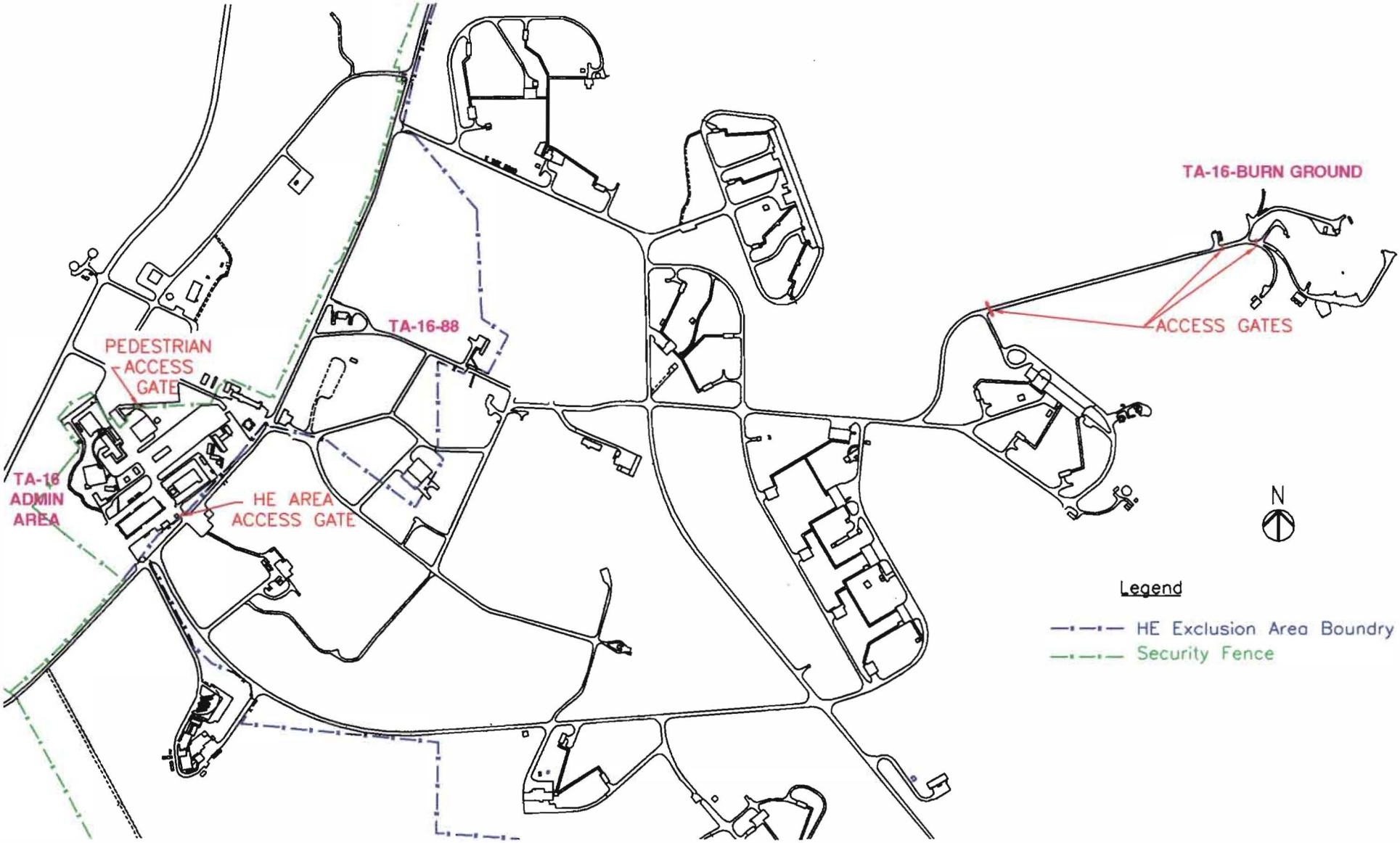


Figure A-11

Location Map of Access Gates, HE Exclusion Area Boundary, and Security Fence in the Vicinity of Technical Area 16

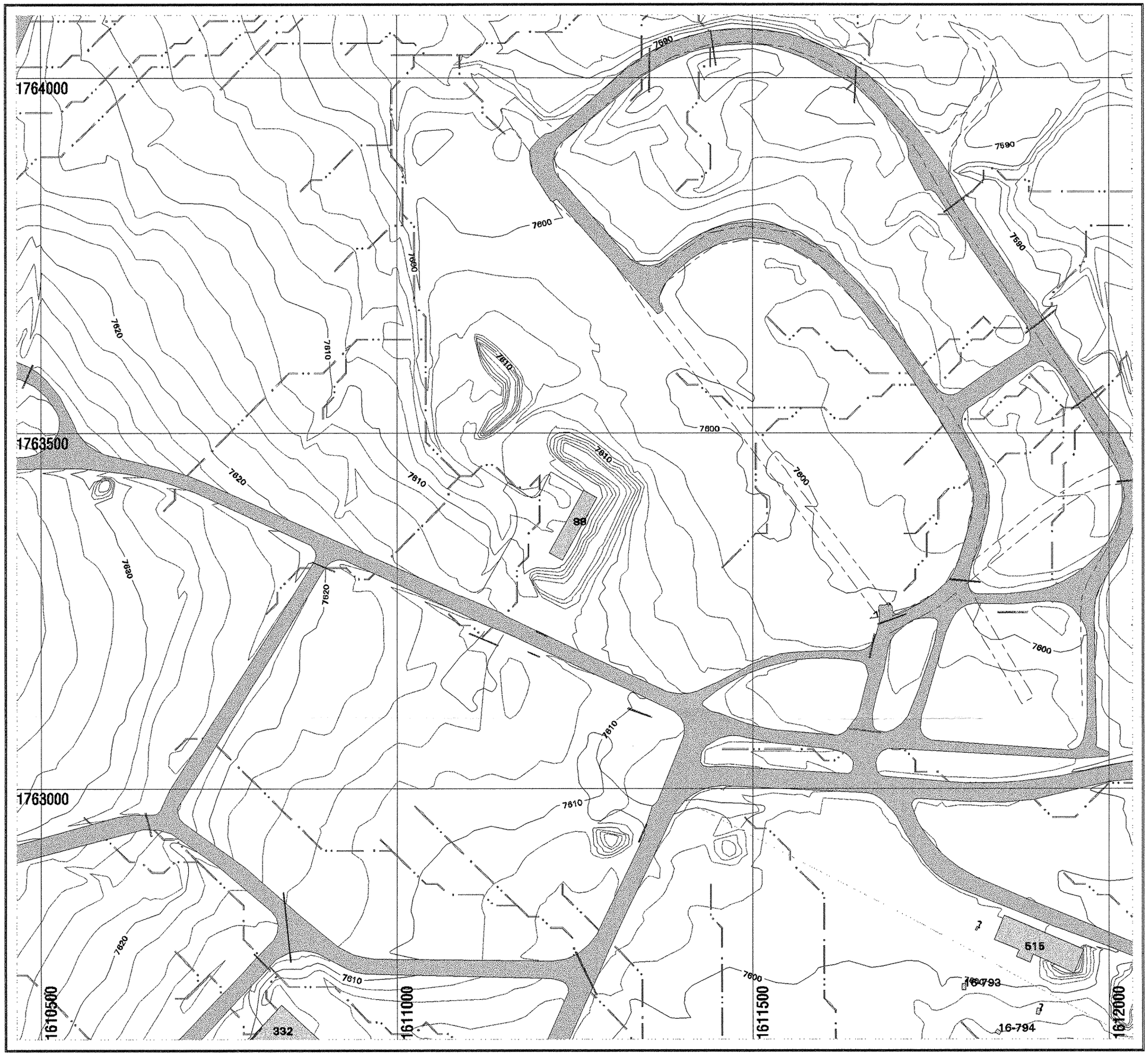


Figure A-12. Drainage Features in the Vicinity of Technical Area 16, Building 88

- Contours, 10 ft
- Contours, 2 ft
- Drainage
- Road, Dirt
- Road, Paved
- Road/Trail
- Storm Drain
- Structure

6214-D

0 100 300
FEET

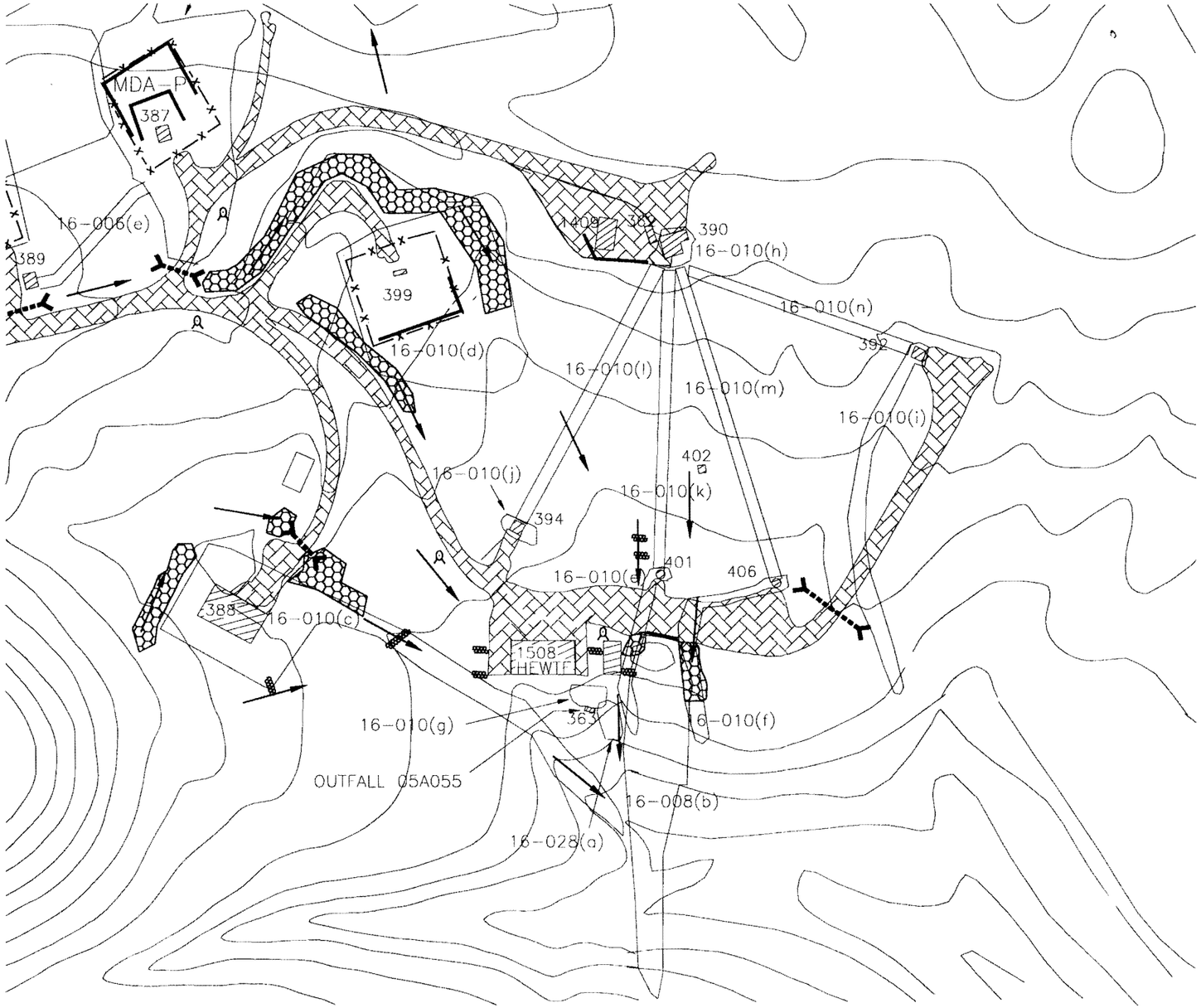
EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G108191 24 Jan 00



SYMBOLS LEGEND	
→	DIRECTION OF STORM WATER FLOW
	FIRE HYDRANT
	PAVED ROAD
	EXISTING BUILDING
	CULVERT
-x-x-x-	FENCE
	PRS AREA
	BERM OR CURB
	RIP RAP
	ROCK CHECK DAM

N

Figure A-13
Drainage Control Features for
the Technical Area 16 Burn Ground

NO.	DATE	CLASS REV.	REVISIONS	DWN	DES	CHKD	SUB	APP

MERRICK
Engineers & Architects
600 Sixth Street, Los Alamos, New Mexico 87544, USA
(505) 662-0606, Fax (505) 662-3851

TA-16 BURN GROUNDS SWPP PLAN

SITE PLAN

BLDG. 1A-

DRAWN JCF
DESIGN
CHECKED
DATE 1/7/00

SUBMITTED
APPROVED FOR RELEASE

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

SHEET 1 OF 1

CLASSIFICATION REVIEWER DATE

PROJECT ID
DRAWING NO.
REV. 10

ATTACHMENT B

WASTE ANALYSIS PLAN

ATTACHMENT B
WASTE ANALYSIS PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(2); 20 NMAC 4.1, Subpart V, 264.13, "General Waste Analysis;≅ and 20 NMAC 4.1, Subpart VIII, 268.7, "Waste Analysis and Record-Keeping," revised January 1, 1997, waste analysis requirements for hazardous and mixed low-level wastes managed at Technical Area 16 are addressed in Appendix B of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0.

ATTACHMENT C

INSPECTION PLAN

ATTACHMENT C
INSPECTION PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(5), and 20 NMAC 4.1, Subpart V, 264.15, "General Inspection Requirements," revised January 1, 1997, inspection requirements for the hazardous and mixed low-level waste management units at Technical Area 16 are addressed in Appendix C of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0.

ATTACHMENT D

PERSONNEL TRAINING PLAN

ATTACHMENT D

PERSONNEL TRAINING PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(12), and 20 NMAC 4.1, Subpart V, 264.16, "Personnel Training," revised January 1, 1997, training requirements for treatment, storage, and disposal facility workers who work at the Technical Area 16 container storage unit and burn ground unit are addressed in Appendix D of the ALos Alamos National Laboratory General Part B Permit Application," Revision 1.0, which was updated in Appendix D of the "Los Alamos National Laboratory General Part B Plans Permit Modification Request," submitted to the New Mexico Environment Department on November 19, 1999.

ATTACHMENT E

CONTINGENCY PLAN

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LIST OF ABBREVIATIONS/ACRONYMS

ESA	Engineering Sciences and Applications
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
TA	technical area

ATTACHMENT E

CONTINGENCY PLAN

In accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart V, Part 264, Subpart D, AContingency Plan and Emergency Procedures,≅ and 20 NMAC 4.1, Subpart IX, 270.14(b)(7), revised January 1, 1997, contingency measures applicable to the waste management units at Technical Area (TA) 16 are provided in Appendix E of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (Los Alamos National Laboratory [LANL], 1998), hereinafter referred to as the LANL General Part B. Specific information on emergency response resources and release prevention/mitigation at TA-16 is provided below.

Figures E-1 and E-2 show the evacuation routes and muster areas that may be used at the TA-16 container storage unit and burn ground unit, respectively, in the event of an emergency. In addition, a listing of emergency equipment currently available for use at the TA-16 waste management units is included as Tables E-1 and E-2. The evacuation routes, muster area locations, and emergency equipment are subject to change as conditions or facility procedures warrant.

E.1 EMERGENCY RESPONSE RESOURCES

The Engineering Sciences and Applications (ESA) Division is responsible for the waste management units at TA-16. Appropriate ESA personnel have been trained in emergency procedures.

E.2 RESPONSIBILITY

At TA-16, ESA Division is responsible for correction of a nonsudden release from the waste management units if the correction can be performed safely with normal maintenance and management procedures. Personnel from the Emergency Management and Response Office 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 New Mexico Environment Department.

E.3 REMEDIAL ACTION

Contingency or emergency measures are unanticipated "fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste ..." for which a schedule of remedial actions cannot be reasonably ascertained. Any remedial actions carried out under the provisions of the contingency plan will be performed as soon as possible to ensure protection of human health and

the environment, as described in Appendix E of the LANL General Part B. These remedial actions may include site cleanup; proper handling of recovered waste, contaminated soil, or contaminated surface water; decontaminating equipment, as needed; replacing or repairing equipment, as needed; and testing to verify successful cleanup.

ESA Division personnel conduct regularly scheduled inspections at TA-16 to detect deterioration and/or failure of containment at the TA-16 waste management units. If an inspection reveals deterioration or failure, personnel ensure that maintenance or replacement is performed, as appropriate.

E.4 REFERENCES

LANL, 1998, ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table E-1
Emergency Equipment near the Technical Area (TA) 16, Building 88, Container Storage Unit[a]

FIRE CONTROL EQUIPMENT

Fire extinguishers are mounted next to the west-facing door at TA-16-88.

General capabilities

These portable units have a 30-pound capacity and may be used by any properly trained employee in the event of fire.

Several fire hydrants are located in the vicinity of TA-16-88.

General capabilities

The fire hydrants will supply water to hoses or foam-producing equipment at adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart V, 264.32, revised January 1, 1997.

SPILL CONTROL

The floor of TA-16-88 has been sealed with epoxy paint to minimize contamination in the event of a spill. Material Safety Data Sheets are available to determine appropriate spill response.

COMMUNICATION EQUIPMENT

One telephone is located inside the west-facing door of TA-16-88.

One telephone is located just outside the west-facing door of TA-16-88.

General Capabilities

Telephones for internal and external communication are available for use by all employees.

DECONTAMINATION EQUIPMENT

Decontamination equipment is brought on site, as needed.

General Capabilities

The Health Physics Operations Group and the Hazardous Materials Response Office at Los Alamos National Laboratory have decontamination equipment and supplies available to respond in the event of a mixed low-level waste spill at TA-16-88.

PERSONAL PROTECTIVE EQUIPMENT

Respirators, coveralls, and safety glasses are available for TA-16 personnel during waste-handling

[a] Equipment types and locations are subject to change.

operations.

[a] Equipment types and locations are subject to change.

Table E-2
Emergency Equipment near the Technical Area (TA) 16 Burn Ground Unit[a]

FIRE CONTROL EQUIPMENT

Fire extinguishers are located at or in:

Tank-truck garage (TA-16-1507)
Control Building (TA-16-389)
High Explosives Wastewater Treatment Facility (HEWTF) (TA-16-1508)
Each truck used to transport high explosives

General Capabilities

These portable units may be used by any properly trained employee in the event of fire.

Four fire hydrants are located within the TA-16 Burn Ground Unit.
Three additional fire hydrants are located at the TA-16 Burn Ground.

General Capabilities

The fire hydrants will supply water at adequate volume and pressure to satisfy the requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart V, 264.32, revised January 1, 1997.

Water spigots are located at TA-16-388, TA-16-399, TA-16-401, and TA-16-406.
A fire alarm pull station is located at the HEWTF.
The Central Alarm Station is notified before all open burning operations. In dry conditions, when operations may result in a grass fire, the Los Alamos County Fire Department is notified and requested to prepare to respond.

SPILL CONTROL

Portable berms to contain spills are stored in an all-weather cabinet near the center of the TA-16 Burn Ground, at the less-than-90-day storage area (TA-16-386), and beside the Control Building.

COMMUNICATION EQUIPMENT

Telephones are available at the Control Building, at the TA-16-401 Sand Filter, at the HEWTF, and at the railroad gate at the entrance to the Burn Ground.

General Capabilities

Telephones for internal and external communication are available for use by all employees.

See footnotes at end of table.

Table E-2 (continued)
Emergency Equipment near the Technical Area (TA) 16
Burn Ground Unit[a]

DECONTAMINATION EQUIPMENT

Eyewash stations are located in the tank-truck garage and in the HEWTF.

Water spigots with hoses attached are available at the TA-16-388 Flash Pad/Burn Tray, the TA-16-399 HE Burn Tray, and the TA-16-401 and TA-16-406 Sand Filters for general washdown.
Material Safety Data Sheets (MSDS) are available at the Control Building.

General Capabilities

Eyewashes are used by personnel who receive a chemical splash to the eyes. MSDSs for the chemical(s) should be obtained prior to working with hazardous waste or hazardous material to determine if the application water is indicated for decontamination. The MSDSs are also maintained to provide information during emergency response.

PERSONNEL PROTECTION EQUIPMENT

Respirators, coveralls, and safety glasses are available for TA-16 personnel during waste-handling operations.
All vehicles are equipped with first-aid kits.

[a] Equipment types and locations are subject to change.

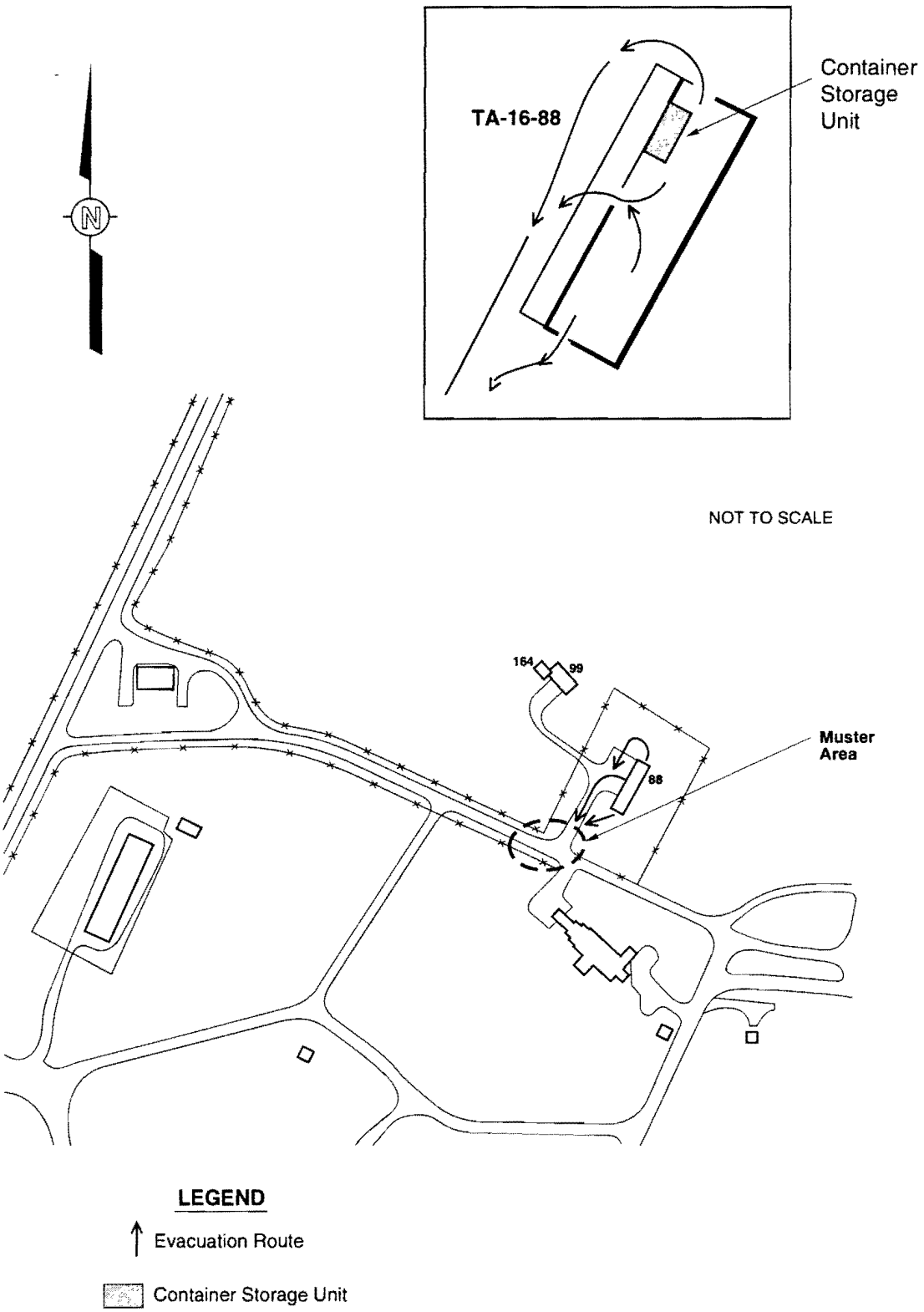

Figure E-1

Evacuation Routes and Muster Area at the Technical Area (TA) 16, Building 88, Container Storage Unit

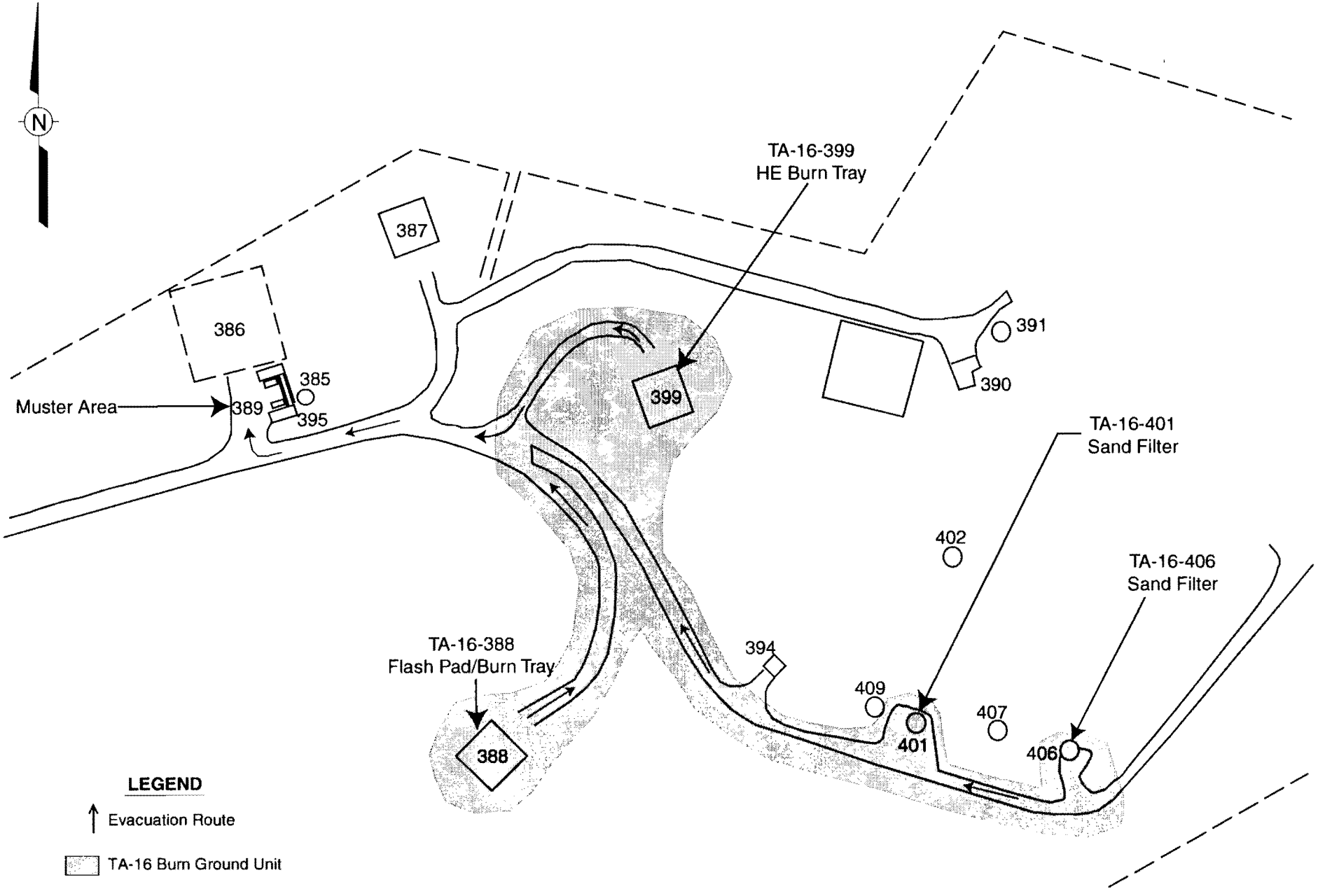

Figure E-2
Evacuation Routes and Muster Area at [illegible]chnical Area (TA) 16 Burn Ground Unit

ATTACHMENT F.1

CLOSURE PLAN FOR TECHNICAL AREA 16, BUILDING 88, CONTAINER STORAGE UNIT

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LIST OF ABBREVIATIONS/ACRONYMS

CSU	container storage unit
ESH-1	Health Physics Operations Group
ESH-5	Industrial Hygiene and Safety Group
ft	feet (foot)
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
NMED	New Mexico Environment Department
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SW-846	EPA=s ATest Methods for Evaluating Solid Waste, Physical/Chemical Methods≅
TA	technical area

ATTACHMENT F.1

CLOSURE PLAN FOR TECHNICAL AREA 16, BUILDING 88, CONTAINER STORAGE UNIT

The information provided in this closure plan is submitted to address the applicable closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(13), and 20 NMAC 4.1, Subpart V, Part 264, Subparts G and I, revised January 1, 1997 [1-1-97]. This closure plan describes the activities necessary to close the container storage unit (CSU) at Los Alamos National Laboratory (LANL) Technical Area (TA) 16, Building 88 (TA-16-88). General closure information applicable to all hazardous and mixed waste management units at LANL and specific sampling and analytical procedures to be used during closure activities are presented in Appendix F of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (LANL, 1998a), hereinafter referred to as the LANL General Part B. The general closure information referenced includes closure performance standards; amendment of the closure plan; closure cost estimate, financial assurance, and liability requirements; closure certification and report; and survey plat and post-closure requirements.

F.1 GENERAL DESCRIPTION

The CSU is located at TA-16-88. Figure F.1-1 shows the location of TA-16 at LANL. The CSU consists of an area approximately 15 feet (ft) by 10 ft within TA-16-88 that is used for storage of solid hazardous and mixed low-level wastes (Figure F.1-2). A detailed description of the CSU at TA-16-88 is provided in Attachment G of this permit renewal document. LANL evaluates closure plans and, if necessary, revises the plans to address conditions at the time of actual closure. If revised, the amended closure plan will be submitted to the New Mexico Environment Department (NMED) for review and approval. The location and disposition of all wastes generated during closure will be documented in the final closure report. The estimated year of closure for the TA-16 CSU is 2100.

F.1.1 Estimate of Maximum Waste in Storage

The maximum inventory of waste that may be in storage at any time in the TA-16-88 CSU is estimated at 275 gallons.

F.1.2 Description of Waste

Solid hazardous and mixed low-level waste may be stored at the CSU in TA-16-88. Some wastes are considered as mixed wastes because Resource Conservation and Recovery Act (RCRA)-

characteristic and/or -listed wastes are or may be present in the waste, along with a radioactive component. Information on the hazardous component(s) of all wastes potentially stored at the TA-16-88 CSU is provided in the ALos Alamos National Laboratory General Part A Permit Application,≅ Revision 0.0 (LANL, 1998b).

F.1.3 Removal of Waste

Prior to the initiation of closure activities, all wastes will be removed from the CSU at TA-16-88. Containers will be removed with normal material-handling equipment. Small containers may be handled manually or with dollies. Containers will be placed onto trucks or trailers for transport. Appropriate shipping papers will accompany the wastes during transport. Containers holding hazardous or mixed low-level wastes will be moved to an approved on-site facility or an off-site treatment, storage, or disposal facility.

F.1.4 Closure Procedures and Decontamination

To the extent possible, all contaminated structures, surfaces, and equipment (if present) at the TA-16-88 CSU will be decontaminated for RCRA-regulated constituents. Structures, surfaces, and equipment that cannot be decontaminated will be managed in compliance with appropriate regulations. All sampling conducted during closure and decontamination will be done in accordance with quality assurance (QA)/quality control (QC) procedures. Closure will be conducted in accordance with the schedule presented in Table F.1-1.

Before proceeding with any closure activities, the TA-16-88 CSU will be surveyed for radiological contamination as an indicator of potential RCRA-regulated constituent contamination and for worker safety. Personal protective equipment (PPE) and monitoring requirements will be determined by LANL's Health Physics Operations (ESH-1) and Industrial Hygiene and Safety (ESH-5) groups following a field inspection. The level of PPE that will be required will depend upon the levels of radiological and/or chemical contamination that are detected, if any. If ESH-1 and ESH-5 surveys do not indicate detectable contamination levels, minimum PPE requirements will consist of coveralls, steel-toed footwear, and safety glasses or face shields. If an overhead danger is present, hard hats will be worn. All workers involved in closure activities will be required to have appropriate training and medical monitoring. Contaminated PPE will either be decontaminated or managed in compliance with appropriate regulations.

Before any decontamination activity begins, two samples of clean water and detergent (washwater) solution (squeezed from mops and/or sponges prior to use) will be collected. The CSU will be inspected for any cracks or conditions that would potentially lead to the loss of decontamination-liquid containment. If any defects, deterioration, damage, or hazards affecting containment are discovered during inspection, appropriate remedial actions (including repairs, maintenance, or replacement) will be completed before decontamination activities begin.

A portable berm will be placed around the perimeter of the CSU to contain washwater resulting from decontamination activities. The floor of the CSU and any equipment and/or structures located within the unit will then be wiped down with a washwater solution. The floor and any equipment and/or structures will be wiped down with mops and/or sponges to minimize the amount of liquid waste generated as a result of decontamination activities. Washwater resulting from decontamination activities will collect within the bermed area.

Washwater collected in the bermed area will be transferred to appropriate containers and sampled. Both the clean and used washwater will be analyzed for the appropriate parameters listed in Table E-3 of Appendix E in the LANL General Part B (LANL, 1998a). The wash cycles will continue until the floor and any equipment and/or structures in the area have been cleaned to established levels (see Section F.1.4.2) or the decision is made to manage the materials as contaminated waste. (An additional sample of clean washwater solution squeezed from mops and/or sponges prior to use will be collected for each additional washdown event.) If the used washwater is nonhazardous and nonradioactive, it will be managed appropriately in accordance with LANL policy. Otherwise, the used washwater will be managed at an appropriate on-site facility, depending on the regulated components present.

Under normal circumstances, soil sampling will not be applicable for the TA-16-88 CSU because storage will occur inside a building with an impervious floor. However, if soil sampling is deemed necessary based on analytical evidence and the operational history of TA-16-88, soil sampling will be performed to verify that no hazardous constituents remain upon closure as a result of container storage. A grid will be sited over the area to be sampled; boreholes will be drilled through the floor material, if necessary; and soil samples will be collected and analyzed to determine the horizontal and vertical extent of contamination.

F.1.4.1 Decontamination Equipment

Prior to use, all reusable decontamination equipment will be rinsed with distilled water. Decontamination equipment rinsate blanks will be collected and analyzed in accordance with QA/QC procedures. Reusable protective clothing, tools, and equipment used during closure activities will be scraped as necessary to remove any residue and cleaned with a washwater solution. Residue, disposable equipment, and reusable equipment that cannot be decontaminated will be containerized and managed appropriately at an approved on-site facility, depending on the regulated constituents present.

F.1.4.2 Decontamination Verification

Sufficient sampling and analysis will be required to demonstrate that hazardous and/or mixed waste residue is not present at the CSU after closure. Two samples of clean washwater solution (squeezed from mops and/or sponges prior to use) will be collected before initial washdown of the TA-16-88 CSU. The samples will be analyzed for the appropriate parameters, as discussed in Section F.1.4. Analytical procedures will conform to methods found in the most current version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (*SW-846*) (U.S. Environmental Protection Agency, 1986). Used washdown solutions will be analyzed for the same parameters. Washdown solutions will be considered contaminated if the used washwater solution shows a significant increase (i.e., determined using statistical methods defined in *SW-846*) in the analytical parameters over the clean washwater solution. If subsequent washdowns are deemed necessary, an additional sample of clean washwater solution (squeezed from mops and/or sponges prior to use) will be collected for each additional washdown event.

Successful decontamination meets one of the following criteria:

- X No detectable RCRA-regulated constituent residues from the storage of authorized RCRA-regulated wastes are identified in samples collected during closure activities.
- X Analytical results of samples collected during closure activities identify no statistically significant concentrations of RCRA-regulated constituents above baseline data or above established background concentrations.
- X Detectable concentrations of RCRA-regulated constituents in samples collected during closure activities are at or below levels agreed upon with the NMED to be protective of human health and the environment.
- X 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.

An alternative demonstration of decontamination may be proposed and justified at the time of unit closure, as circumstances indicate. The NMED will evaluate the proposed alternative in accordance with the standards and guidance then in effect and, if approved, incorporate the alternative into this closure plan.

F.1.5 References

LANL, 1998a, ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, ALos Alamos National Laboratory General Part A Permit Application,≅ Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

U.S. Environmental Protection Agency, 1986, ATest Methods for Evaluating Solid Waste, Physical/Chemical Methods≅ (SW-846), U.S. Environmental Protection Agency, Washington, D.C.

Table F.1-1

Schedule for Closure Activities at Technical Area 16, Building 88, Container Storage Unit

Activity	Maximum Time Required[a]
Let contract request for proposals	-90 Days
Notify the New Mexico Environment Department (NMED)	-45 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Approval of Closure Plan	Day 0
Begin closure activities (perform washdown of structures and/or equipment)	Day 10
Perform initial sampling	Day 15
Analyze samples	Day 45
Perform additional washdown (if necessary)	Day 50
Perform additional sampling (if necessary)	Day 60
Analyze additional samples (if necessary)	Day 90
Perform final cleanup (e.g., removal of decontaminated equipment and decontamination wastes)	Day 120
Verify decontamination	Day 150
Submit final report to the 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, may not require the maximum time listed, or may require more time than indicated above. Extensions to the schedule may be requested, as needed.

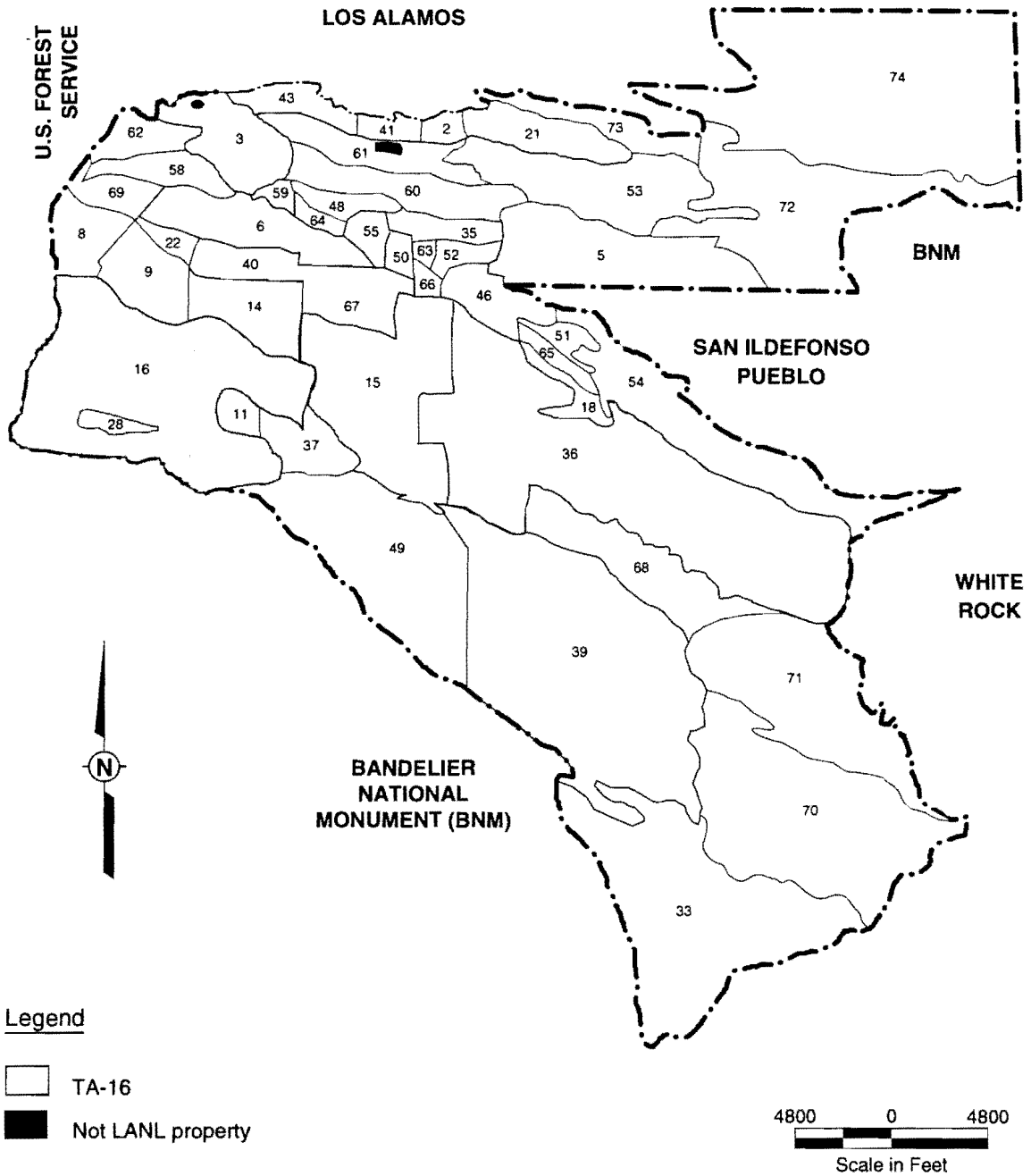

Figure F.1-1
Location Map of Technical Area (TA) 16 at Los Alamos National Laboratory (LANL)

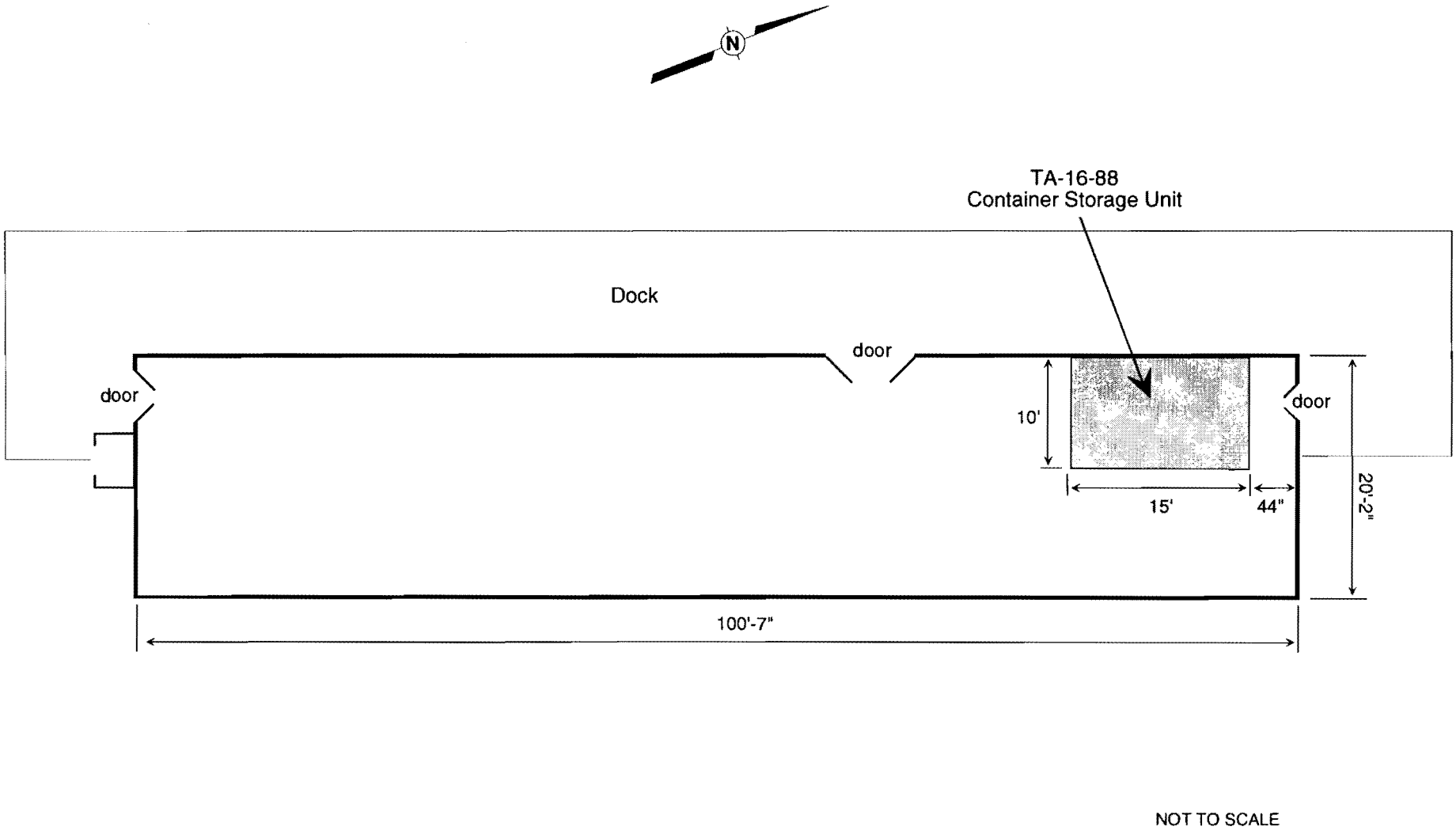

Figure F.1-2
Technical Area (TA) 16, Building 88, Container Storage Unit

ATTACHMENT F.2

CLOSURE PLAN FOR TECHNICAL AREA 16
BURN GROUND UNIT

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F.2-2	Location Map Showing the Burn Ground Unit at Technical Area (TA) 16

LIST OF ABBREVIATIONS/ACRONYMS

ESA	Engineering Sciences and Applications Division
ESH-5	LANL's Industrial Hygiene and Safety Group
HE	high explosives
LANL	Los Alamos National Laboratory
lb	pounds
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
NMED	New Mexico Environment Department
OB	open burning
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
TA	technical area

ATTACHMENT F.2

CLOSURE PLAN FOR TECHNICAL AREA 16 BURN GROUND UNIT

The information provided in this closure plan is submitted to address the applicable closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.14(b)(13), and 20 NMAC 4.1, Subpart V, Part 264, Subparts G and X, revised January 1, 1997 [1-1-97]. This closure plan describes the activities necessary to close the hazardous waste open burning (OB) unit at Los Alamos National Laboratory (LANL) Technical Area (TA) 16. General closure information applicable to all hazardous and mixed waste management units at LANL and specific sampling and analytical procedures to be used during closure activities are presented in Appendix F of the ALos Alamos National Laboratory General Part B Permit Application,≅ Revision 1.0 (LANL, 1998), hereinafter referred to as the LANL General Part B. The general closure information referenced addresses closure performance standards; amendment of the closure plan; closure cost estimate, financial assurance, and liability requirements; closure certification and report; and survey plat and post-closure requirements.

F.2 CLOSURE PROCEDURES FOR THE TA-16 BURN GROUND UNIT [20 NMAC 4.1, Subpart V, 264.112]

The hazardous waste management unit addressed in this Part B permit renewal document is located at TA-16 at LANL. Figure F.2-1 shows the location of TA-16 at LANL. Figure F.2-2 shows the specific locations of the TA-16 Burn Ground Unit and the structures located within the unit. A detailed unit description is provided in Section 2.0 and Attachment H of this Part B permit renewal document. The closure schedule for the TA-16 Burn Ground Unit is outlined in Table F.2-1. LANL evaluates closure plans and, if necessary, revises the plans to address conditions at the time of actual closure. If revised, the amended closure plan will be submitted to the New Mexico Environment Department (NMED) for review and approval. The location and disposition of all wastes generated during closure will be documented in the final closure report. The estimated year of closure for the TA-16 Burn Ground Unit is 2100.

F.2.1 Description of Waste/Estimate of Maximum Waste Capacity

The TA-16 Burn Ground Unit structures are used to treat a variety of high explosives (HE)-contaminated wastes, including but not limited to, scrap HE, HE-contaminated equipment and particulate matter, combustible solids, and HE-contaminated liquids. Information on the hazardous component of the wastes treated at the TA-16 Burn Ground Unit is provided in Appendix B of the

LANL General Part B (LANL, 1998). The maximum amount of waste that may be treated at the TA-16-388 Flash Pad is 40,000 pounds (lb) per burn. The maximum waste treatment capacity for the TA-16-388 and TA-16-399 Burn Trays is 100 gallons and 1,000 lb, respectively. The maximum waste treatment capacity for the TA-16-401 and TA-16-406 Sand Filters is 1,000 lb of HE per burn each.

F.2.2 Partial Closure

Partial closure at the TA-16 Burn Ground Unit may consist of closing one or more of the OB structures within the unit while leaving the other OB structures within the unit in service. For closure or partial closure, the following procedures described in Section F.2.4 would apply to the structure(s) being closed.

F.2.3 Removal of Waste

As described in Attachment H, wastes are treated at each Burn Ground Unit structure when they are placed at the structure, and ash residues are removed promptly. Therefore, removal of waste prior to the initiation of closure activities is not anticipated.

F.2.4 Closure Procedure and Decontamination

To the extent possible, contaminated OB structures associated with the TA-16 Burn Ground Unit will be decontaminated, if necessary. Structures and equipment that cannot be decontaminated will be managed in compliance with appropriate regulations. Closure activities may include the removal, treatment, segregation, and/or disposition of structures and associated equipment that are scheduled to be closed. After removal and segregation, management of the structures and equipment will include treatment by OB at TA-16 and/or characterization by analytical samples prior to recycling or disposal. Sampling conducted during closure and decontamination will be done in accordance with quality assurance (QA)/quality control (QC) procedures. Closure will be conducted in accordance with the schedule presented in Table F.2-1. The final assessment and remediation of the OB area undergoing closure will be integrated and coordinated as Resource Conservation and Recovery Act (RCRA) corrective actions.

Before proceeding with closure activities, the OB structure to be closed will receive a thorough visual inspection for unburned materials. Personal protective equipment (PPE) and monitoring requirements will be determined by LANL's Industrial Hygiene and Safety (ESH-5) Group and groups within Engineering Sciences and Applications (ESA) Division following the initial field

inspection. The level of PPE that will be required will depend upon the levels of chemical contamination that are detected, if any. If ESH-5 and ESA surveys do not indicate detectable contamination levels, minimum PPE requirements will consist of coveralls, steel-toed footwear, and safety glasses or face shields. If an overhead danger is present, a hard hat will be worn. Workers involved in closure activities will be required to have appropriate training and medical monitoring. Contaminated PPE will either be decontaminated or managed in compliance with appropriate regulations.

F.2.5 Decontamination Equipment

Prior to use, any reusable decontamination equipment will be rinsed with distilled water. Decontamination equipment rinsate blanks will be collected and analyzed in accordance with QA/QC procedures. Reusable protective clothing, tools, and equipment used during closure activities will be scraped as necessary to remove any residue and cleaned with a washwater solution. Residue, disposable equipment, and reusable equipment that cannot be decontaminated will be containerized and managed appropriately at an approved on-site facility, depending on the regulated constituents present. Used washwater will be collected and analyzed for the appropriate parameters listed in Table E-3 of Appendix E in the LANL General Part B (LANL, 1998). If the used washwater is nonhazardous, it will be managed appropriately in accordance with LANL policy. Otherwise, it will be transported to the TA-16 HE Wastewater Treatment Facility or other appropriate LANL or off-site facility, depending on the regulated components present.

F.2.6 Decontamination Verification

Sufficient sampling and analysis will be required to demonstrate that closure performance standards have been met. The samples will be analyzed for the appropriate parameters, as discussed in Section F.2.5. Analytical procedures will conform to methods found in the most current version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (U.S. Environmental Protection Agency, 1986). Used washwater will be analyzed for the same parameters.

Decontamination activities will be performed until at least one of the following decontamination criteria has been met:

- ∃ No detectable RCRA-regulated constituent residues from treatment of authorized RCRA-regulated wastes are identified in samples collected during closure activities.

- Detectable concentrations of RCRA-regulated constituents in samples collected during closure activities are at or below existing regulatory action levels, as agreed upon with the NMED.

- Detectable concentrations of RCRA-regulated constituents in samples collected during closure activities identify no statistically significant concentrations of RCRA-regulated constituents above baseline data.

- Detectable concentrations of RCRA-regulated constituents in samples collected during closure activities are at or below levels agreed upon with the NMED to be protective of human health and the environment.

- 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.

An alternative demonstration of decontamination may be proposed and justified at the time of closure, as circumstances indicate. NMED will evaluate the proposed alternative in accordance with the standards and guidance then in effect and, if approved, incorporate the alternative into this closure plan.

F.2.7 References

LANL, 1998, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

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

Table F.2-1

Schedule for Closure Activities at the Technical Area 16 Burn Ground Unit

Activity	Maximum Time Required[a]
Let contract request for proposals	-90 Days
Notify the New Mexico Environment Department (NMED)	-45 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Approval of Closure Plan	Day 0
Final treatment of waste	Day 5
Begin closure activities (perform additional treatment of structures, if necessary)	Day 10
Perform initial sampling	Day 15
Analyze samples	Day 45
Perform additional sampling, if necessary	Day 60
Analyze additional samples, if necessary	Day 90
Perform final cleanup (e.g., removal of decontamination wastes)	Day 120
Verify decontamination	Day 150
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, may not require the maximum time listed, or may require more time than indicated above. Extensions to the schedule may be requested, as necessary.

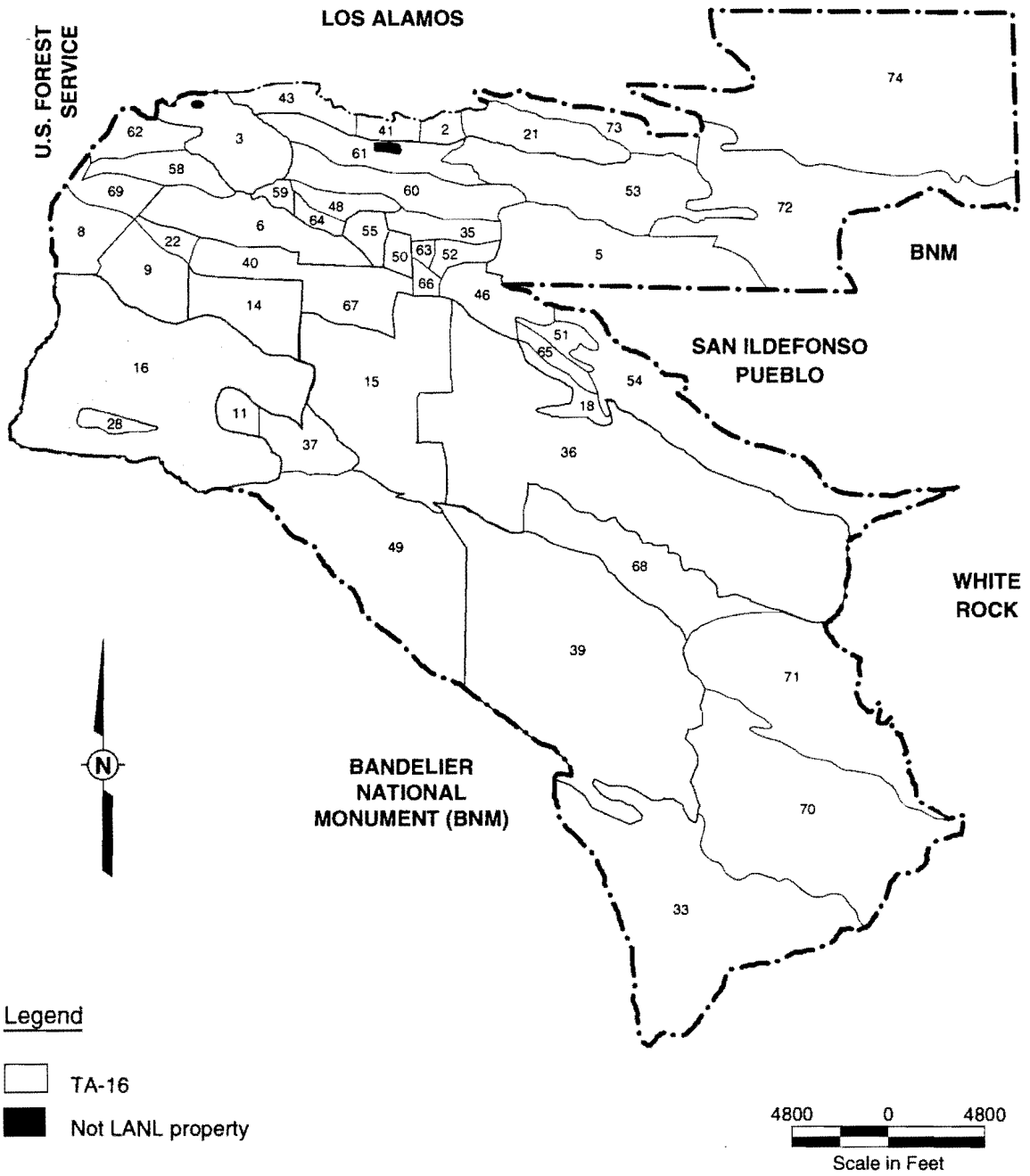

Figure F.2-1
Location Map of Technical Area (TA) 16 at Los Alamos National Laboratory (LANL)

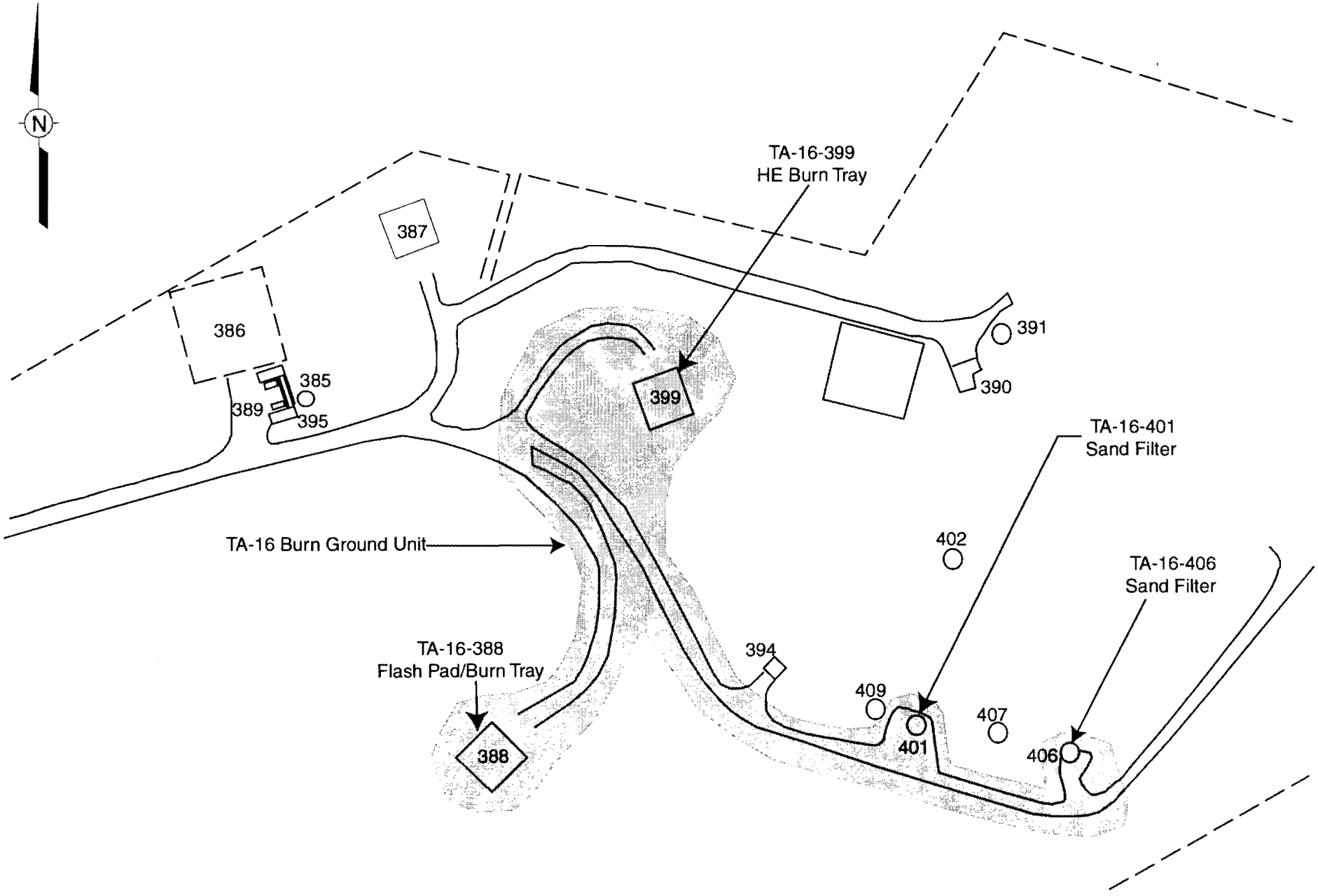

Figure F.2-2
Location Map Showing the Burn ' nd Unit at Technical Area (TA) 16

ATTACHMENT G

CONTAINER MANAGEMENT

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LIST OF ABBREVIATIONS/ACRONYMS

CAS	Central Alarm System
CSU	container storage unit
ft	feet/foot
LACFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
PPE	personal protective equipment
PTLA	Protection Technology Los Alamos
TA	technical area

ATTACHMENT G
CONTAINER MANAGEMENT

The information provided in this attachment is submitted to address the applicable container storage requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.15, and 20 NMAC 4.1, Subpart V, Part 264, Subpart I, revised January 1, 1997 [1-1-97]. This attachment provides an overview of current facility operations and waste management practices for the Technical Area (TA) 16, Building 88 (TA-16-88), hazardous and mixed low-level solid waste container storage unit (CSU) at Los Alamos National Laboratory (LANL) and complements the information provided in Section 2.0 of this permit renewal document. It includes detailed descriptions of the TA-16-88 CSU and the current waste management practices associated with it. Table G-1 summarizes applicable regulatory references for container storage and the corresponding location where the requirement is addressed in this permit renewal document.

G.1 TA-16-88 CONTAINER STORAGE UNIT

TA-16 is located in the southwestern quadrant of LANL at the west end of the Pajarito Plateau, near the foothills of the Jemez Mountains. It is bounded on the north by TA-8, TA-9, TA-14, and Cañon de Valle; on the east by TA-11, TA-15, TA-37, and TA-49; on the south by State Road 4 and Bandelier National Monument; and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevation ranges from approximately 7,700 feet (ft) at the west end of the TA to approximately 6,800 ft at the lower east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops. TA-16-88 is located approximately 1,000 ft east of Anchor Ranch Road and 1,000 ft south of K-Site Road (Figure G-1). It is a single-room metal building on a concrete slab and measures approximately 100 ft by 20 ft. The CSU is approximately 10 ft by 15 ft and is located in the northwest corner of the building (Figure G-2). The floor is concrete and is sealed with epoxy paint. The CSU is used to store hazardous and mixed low-level solid waste and has a maximum storage capacity of 275 gallons. No liquid or liquid-bearing wastes are managed at the CSU. Containers that may be used for storage include, but are not limited to, 55-gallon drums, crates, boxes, and various small containers and irregularly-shaped containers.

G.2 GENERAL FACILITY OPERATIONS AND WASTE MANAGEMENT PRACTICES [20 NMAC 4.1, Subpart V, Part 264, Subpart I]

The following provides an overview of current facility operations and waste management practices that are applicable to the TA-16-88 CSU. This overview includes a discussion of container handling and inspection; security and access control; preparedness and prevention; hazards prevention; special requirements for ignitable, reactive, or incompatible wastes; and air emission standards for containers. This information is submitted to fulfill the requirements of 20 NMAC 4.1, Subpart V, Part 264, Subpart I [1-1-97]. Specific waste management practices and procedures detailed herein may be subject to change as a result of LANL safety and waste management policy changes.

G.2.1 Container Handling and Inspection [20 NMAC 4.1, Subpart V, 264.171, 264.173, and 264.174]

Handling and inspection requirements for containers stored within the TA-16-88 CSU are presented in Section 2.1 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.171, 264.173, and 264.174 [1-1-97].

G.2.2 Security and Access [20 NMAC 4.1, Subpart IX, 270.14(b)(4) and 270.14(b)(19)(viii); 20 NMAC 4.1, Subpart V, 264.14]

Security at TA-16-88 is maintained with physical and administratively-controlled barriers. These barriers prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock into the areas and thus satisfy the requirements of 20 NMAC 4.1, Subpart V, 264.14(a) and 264.14(b)(2) [1-1-97]. A security fence surrounds approximately 50 percent of the perimeter of TA-16. Canyon walls and barbed wire fences surround the other 50 percent. Entry to TA-16 is controlled 24 hours a day by Protection Technology Los Alamos (PTLA) security personnel and/or gates equipped with palm readers. Appropriate entry and egress procedures are followed during manned, unmanned, and emergency situations at TA-16. The area is patrolled by PTLA security personnel to ensure that the security fence integrity has not been breached. Outside doors to TA-16-88 are always locked, and the building is equipped with a security alarm. The alarm is monitored by LANL's central alarm system. Only preauthorized personnel can access the building. In accordance with 20 NMAC 4.1, Subpart IX, 270.14(b)(19)(viii) [1-1-97], the locations of the current security fence and access gates are shown on Figure A-11 in Attachment A; these locations are subject to change, but the provisions for security at TA-16-88 will remain constant.

Pursuant to the requirements of 20 NMAC 4.1, Subpart V, 264.14(c) [1-1-97], bilingual (i.e., English and Spanish) warning signs stating "Danger: Unauthorized Personnel Keep Out" are posted on all three doors of TA-16-88. The storage location within the TA-16-88 CSU is posted with an English/Spanish "Hazardous Waste Storage Area" sign. These signs are designed to be legible at a distance of 25 feet from the approaches to this location.

G.2.3 Preparedness and Prevention [20 NMAC 4.1, Subpart V, Part 264, Subpart C; and 20 NMAC 4.1, Subpart IX, 270.14(b)(8)]

The following presents how waste management operations at the TA-16-88 CSU comply with the preparedness and prevention requirements of 20 NMAC 4.1, Subpart V, Part 264, Subpart C [1-1-97]. This section includes a discussion of emergency equipment required at the facility, testing and maintenance of this equipment, personnel access to communications or alarm systems, aisle space and storage configuration, and support agreements with outside agencies.

G.2.3.1 Required Equipment [20 NMAC 4.1, Subpart V, 264.32]

TA-16-88 is equipped with a heat detection system. In the event of a fire, this detection system will activate and PTLA personnel at LANL's Central Alarm Station (CAS) will be automatically notified through the central alarm system. PTLA personnel continuously staff the CAS and can notify the Los Alamos County Fire Department (LACFD) via the central alarm system, if necessary. A telephone is located outside the west-facing door at TA-16-88, and another is located just inside the door. Fire extinguishers appropriate for the types of material stored in the building are also located next to this door. Depending on the size of a fire and the fuel source, fire extinguishers may be used by properly trained on-site personnel. However, LANL policy encourages immediate evacuation of the area and notification of appropriate emergency personnel. Fire hydrants are located in the immediate area of TA-16-88. Water is supplied to the fire hydrants by a municipal water system at an adequate volume and pressure to supply a water hose in the event of a fire. The LACFD may also use other extinguishing media if water is not appropriate for the waste types stored in the building.

Because only solids are handled and stored in this building, spill controls are designed to minimize the potential spread of contamination. The floor of TA-16-88 is sealed with epoxy paint. No water is supplied to the building; hence, potential contaminant dispersal is further minimized. Material

Safety Data Sheets provide useful exposure and emergency response information and are available to determine appropriate response.

G.2.3.2 Testing and Maintenance of Equipment [20 NMAC 4.1, Subpart V, 264.33]

The communication, alarm system, fire protection, spill control, and decontamination equipment associated with operations at the TA-16-88 CSU is inspected and/or tested according to the inspection schedule detailed in Appendix C of the "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0 (LANL, 1998), hereinafter referred to as the LANL General Part B. Maintenance, repair, and replacement of emergency equipment are performed, as needed.

G.2.3.3 Access to Communications or Alarm Systems [20 NMAC 4.1, Subpart V, 264.34]

Whenever waste is being handled at the TA-16-88 CSU, all personnel involved have immediate access to telephones in the building for direct voice contact with another individual. The building is also equipped with a heat alarm system. In the event of an emergency, this equipment allows communication with the operating group management, the Emergency Management and Response Office, and/or the CAS operator.

G.2.3.4 Aisle Space and Storage Configuration [20 NMAC 4.1, Subpart V, 264.35]

Information on aisle space and storage configuration for the TA-16-88 CSU is presented in Section 2.1.3 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.35 [1-1-97].

G.2.3.5 Support Agreements with Outside Agencies [20 NMAC 4.1, Subpart V, 264.37(a)]

LANL maintains support agreements and contracts with outside agencies for emergency response assistance. Information regarding these contracts and support agreements is provided in Section 2.1.2.4 of the LANL General Part B (LANL, 1998).

G.2.4 Hazards Prevention [20 NMAC 4.1, Subpart V, Part 264, Subpart C; 20 NMAC 4.1, Subpart IX, 270.14(b)(8)]

The TA-16-88 CSU is designed and operated to minimize the possibility of fire, explosion, or unplanned releases of hazardous constituents to the environment. The following discusses the general procedures, equipment, and structures that are currently used at TA-16-88 to prevent hazards. This includes preventing hazards during unloading of waste containers, preventing run-on and runoff, preventing contamination of the water supply, mitigating the effects of power outages, preventing undue exposure to personnel, and preventing releases to the atmosphere.

G.2.4.1 Preventing Hazards in Unloading

The use of proper handling equipment, appropriate to a container's size and weight, helps to prevent hazards while unloading wastes. Most waste stored in the TA-16-88 CSU is likely to be generated in the building and hand carried or moved by hand truck, dollies, or carts to the CSU. If waste were to be brought from an outside location, the packaged wastes would unloaded by hydraulic lift, forklift, or similar device onto the loading dock and moved into TA-16-88 through the north-facing or west-facing door.

The methods used to move containers into and within the TA-16-88 CSU will be selected based on the size and weight of containers. This helps to prevent hazards while moving containers. Damaged containers (e.g., severely corroded drums) must be repaired or overpacked or the wastes repackaged in new containers before being stored at the CSU.

G.2.4.2 Preventing Run-On and Runoff [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(ii)]

Run-on and runoff control methods for the TA-16-88 CSU are presented in Section 2.1.12 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(8)(ii) [1-1-97].

G.2.4.3 Preventing Water Supply Contamination [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(iii)]

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of waste-handling operations at the TA-16-88 CSU. The CSU is located inside the building and any material spilled during waste management activities will be remediated pursuant to the appropriate contingency plan as part of normal operations. There is no water supplied to this building, ruling out the possibility that an internal water break will disperse contaminants. The depth to groundwater at

TA-16 is approximately 1,100 ft (Purtymun, 1984). Together, these conditions support the conclusion that water supply contamination is not likely as a result of container storage operations.

G.2.4.4 Mitigating Effects of Power Outages [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(iv)]

Electrical power is supplied to TA-16-88 to operate lights and the alarm systems in the building. In the event of a power failure, operations in the building would cease and personnel would exit the facility. Operations in the CSU would be discontinued temporarily if electrical power was not restored quickly or if container-handling equipment failed. However, neither a power outage nor an equipment failure would affect containment at the CSU.

G.2.4.5 Preventing Undue Exposure [20 NMAC 4.1, Subpart IX, 270.14(b)(8)(v)]

Personnel at the TA-16-88 CSU are required to use appropriate personal protective equipment (PPE) to protect themselves from the hazards found in the work place under normal conditions. Use of PPE protects workers from direct contact with and inhalation or ingestion of hazardous materials. At TA-16-88, PPE is used as needed during waste-handling operations and when responding to unusual hazardous situations. 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.

The PPE to be used is determined on a case-by-case basis by LANL's health physics and industrial hygiene staff. All personnel that use PPE are trained and qualified to use the equipment properly.

G.2.4.6 Preventing Releases to the Atmosphere

Releases to the atmosphere are not anticipated at the TA-16-88 CSU because containers are kept closed during storage. The only exceptions to this practice would be if, upon inspection, it were

determined that a container currently in storage needs to be overpacked or repackaged in a new container. Because only solids are stored, no release would be expected during these activities.

G.2.5 Special Requirements for Ignitible, Reactive, and Incompatible Wastes [20 NMAC 4.1, Subpart IX, 270.14(b)(9), 270.15(c) and (d); 20 NMAC 4.1, Subpart V, 264.17, 264.176, and 264.177]

Reactive wastes are not stored at the TA-16-88 CSU. Special requirements for ignitable and incompatible wastes at the TA-16-88 CSU are presented in Section 2.1.10 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart V, 264.17(a), 264.176, and 264.177(a), (b), and (c); and 20 NMAC 4.1, Subpart IX, 270.14(b)(9) and 270.15(d) [1-1-97].

G.2.6 Air Emission Standards for Containers [40 CFR, Part 264, Subpart CC]

The Code of Federal Regulations, Title 40, Part 264, Subpart CC, “Air Emission Standards for Tanks, Surface Impoundments, and Containers” standards are not applicable to mixed waste management units, containers of hazardous waste with less than 500 parts per million by weight volatile organics, containers of less than 0.1 cubic meters (approximately 26 gallons) capacity, or that have received waste prior to the effective date of regulation (December 6, 1996). The TA-16-88 CSU stores only hazardous and mixed low-level solid wastes; no liquids or liquid-bearing wastes are stored. Therefore, this requirement is not applicable to the TA-16-88 CSU.

G.3 REFERENCES

LANL, 1998, “Los Alamos National Laboratory General Part B Permit Application,” Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Purtyman, 1984, “Hydrologic Characteristics of the Main Aquifer in the Los Alamos Area: Development of Ground Water Supplies,” Los Alamos National Laboratory Report LA-9957-MS, Los Alamos, New Mexico.

Table G-1

Use and Management of Containers Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
§270.15	Specific requirements for containers:	2.0, Attachment G
§270.15(a)	A description of the containment system to demonstrate compliance with §264.175 including at a minimum:	NA
§270.15(a)(1)	Basic design parameters, dimensions, and materials of construction	NA
§270.15(a)(2)	How the design promotes drainage or how containers are kept from contact with standing liquids in the containment system	NA
§270.15(a)(3)	Capacity of the containment system relative to the number and volume of containers to be stored	NA
§270.15(a)(4)	Provisions for managing run-on	NA
§270.15(a)(5)	How accumulated liquids can be analyzed and removed to prevent overflow	NA
§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) includes:	2.0, Attachment G
§270.15(b)(1)	Test procedures and results or other documentation or information to show that the wastes do not contain free liquids	2.1, Attachment G
§270.15(b)(2)	A description of how the storage area is designed or operated to drain or remove liquids or how containers are kept from contact with standing liquids	2.1, Attachment G
§270.15(c)	Provide 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	Attachment A
§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)	2.1, G.2.5
§270.15(e)	Information regarding air emission control equipment as required in §270.27	G.2.6
§270.27(a)	If applicable, specific information requirements for air emissions for containers:	NA
§270.27(a)(2)	Identification of each container area subject to the requirements of Code of Federal Regulations, Title 40, Part 264, Subpart CC and certification by the owner or operator that the requirements are met	NA

Table G-1 (continued)

Use and Management of Containers Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Document
§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
§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 the following information: monitoring point(s), monitoring methods for control devices, monitoring frequency, procedures for documenting exceedances, and procedures for mitigating noncompliances	NA

[a] Not applicable

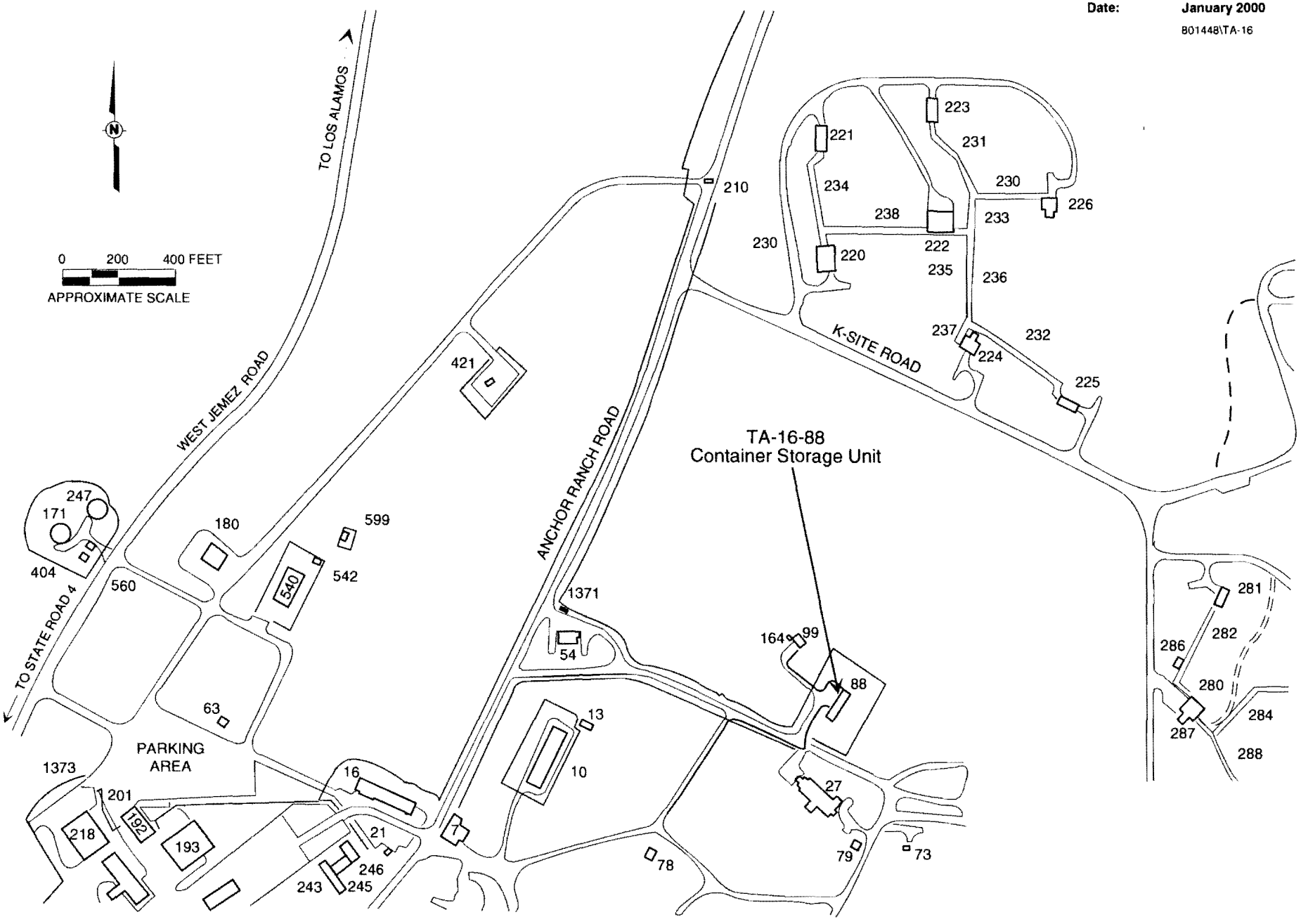

Figure G-1
Site Location Map for Technical Area (TA) 16, Building 88

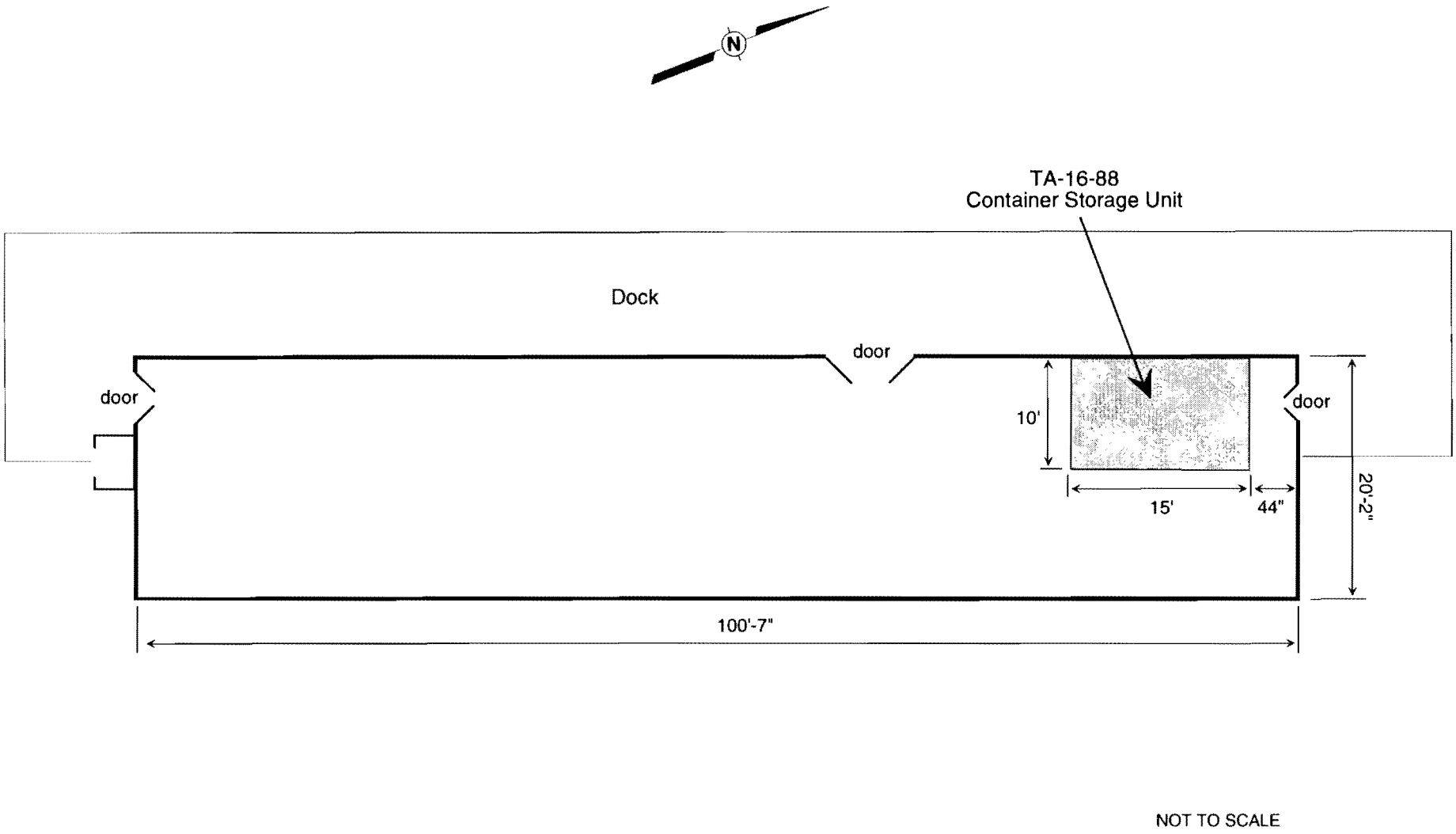

Figure G-2
Technical Area (TA) 16, Building 88, Container Storage Unit

ATTACHMENT H

TA-16 BURN GROUND UNIT MANAGEMENT

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LIST OF ABBREVIATIONS/ACRONYMS

AEHA	U.S. Army Environmental Hygiene Agency
BTU/hr	British thermal units per hour
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ESA	Engineering Science and Applications
ft	feet/foot
FY	fiscal year
HE	high explosives
HWP	Hydrogeologic Workplan
LANL	Los Alamos National Laboratory
20 NMAC 4.1	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
OB	open burning
PPE	personal protective equipment
PTLA	Protection Technology Los Alamos
RCRA	Resource Conservation and Recovery Act
SOP	standard operating procedure
SWPP	Storm Water Pollution Prevention
TA	technical area

LIST OF SUPPLEMENTS

SUPPLEMENT NO.	TITLE
H-1	Supplemental Water Quality Information
H-2	The New Mexico Environment Department's August 17, 1995, Letter to the Department of Energy Los Alamos Area Office Regarding Comments Concerning Groundwater Contamination and Protection at Los Alamos National Laboratory (LANL), Los Alamos, New Mexico.

ATTACHMENT H
TA-16 BURN GROUND UNIT MANAGEMENT

The information provided in this attachment is submitted to address the applicable miscellaneous unit requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), Subpart IX, 270.23, and 20 NMAC 4.1, Subpart V, Part 264, Subpart X, revised January 1, 1997 [1-1-97], as well as thermal treatment requirements in 20 NMAC 4.1, Subpart VI, Part 265, Subpart P [1-1-97). This attachment provides an overview of current facility operations and waste management practices for the Technical Area (TA) 16 Burn Ground Unit and complements the information provided in Section 2.0 of this permit renewal document. It includes detailed descriptions of the open burning (OB) treatment structures, their locations within the Burn Ground Unit, and the current operational and waste management practices associated with them. Requirements for treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; preparedness and prevention; volatile organic air emission standards; and environmental performance standards are also discussed. Table H-1 summarizes applicable regulatory references for miscellaneous units and the corresponding location where the requirement is addressed in this permit renewal document.

The TA-16 Burn Ground Unit (Figures H-1 and H-2) is managed by Los Alamos National Laboratory's (LANL's) Engineering Science and Applications (ESA)-Weapon Materials and Manufacturing Group, which is responsible for the safe treatment, storage, and handling of high-explosives (HE)-contaminated waste material generated by the HE production facilities.

H.1 TA-16 BURN GROUND UNIT STRUCTURES

TA-16 is located in the southwestern quadrant of LANL at the west end of the Pajarito Plateau, near the foothills of the Jemez Mountains (see Figure A-1 in Attachment A). The TA-16 Burn Ground Unit is comprised of several OB structures, which are described below.

H.1.1 TA-16-388 Flash Pad/Burn Tray

In 1998, the New Mexico Environment Department (NMED) granted LANL Temporary Authorization to upgrade the TA-16-388 HE Burn Tray to a propane-fueled flash pad and burn tray (Figure H-3). The upgrade began shortly thereafter. The new designation for TA-16-388 was reflected in the "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0 (LANL, 1998a), submitted to NMED in April 1998 and hereinafter referred to as the

LANL General Part A. The TA-16-388 conversion was subsequently approved by the NMED on May 12, 1999, as a Change During Interim Status, pursuant to 20 NMAC 4.1, Subpart IX, 270.72 [1-1-97].

H.1.1.1TA-16-388 Flash Pad

The TA-16-388 Flash Pad consists of a 22-foot (ft) by 22-ft concrete pad/foundation set on a polypropylene-lined secondary containment area. Inset one ft from the edge of the concrete pad along the two sides and back is a 3-ft-high, 8-inch-thick impervious concrete wall. The foundation of the pad is slanted down toward the back concrete wall, thus providing secondary containment for any spills or run-on/runoff of stormwater. These are collected in the rear of the pad where they either evaporate or can be collected by one of the Burn Ground HE wastewater tank trucks. The entire flash pad can be covered with a movable steel roof when the flash pad is inactive. The configuration of the flash pad and burners is shown in Figure H-4. The maximum treatment capacity of the flash pad is estimated at 40,000 pounds per burn to accommodate the weights of large machine tools and other equipment. However, large burns are conducted only when absolutely necessary because it is more difficult to assure the HE is destroyed on all materials treated. Instead, burns of several hundred pounds are usually conducted.

The heat sources for the flash pad consist of three 5-ft-long forced-air propane burners with adjustable mounts. A burner is mounted outside the wall on each side and the back of the pad. One to three burners can be used, depending on the amount and configuration of the material to be flashed. The total capacity of the propane supply system is approximately 7 million British thermal units per hour (BTU/hr). Therefore, the output of each burner will be dependent on how many are used for a burn. Usually, they are operated at approximately 2 million BTU/hr. This provides adequate heat to bring the material being flashed to a temperature sufficient to destroy all HE contamination, typically to a temperature above 800 degrees Fahrenheit.

Television cameras mounted above the front of the TA-16-388 structure monitor operations at the flash pad, and Burn Ground personnel observe the flash operations on the monitor in the Control Building (TA-16-389). Lockout keys for the power that operates the flash pad are also located in the Control Building. The lockout keys are removed and carried by personnel working at the flash pad. Once the flash pad has been set up for a treatment and has been barricaded

to prevent traffic from approaching the pad, personnel return to the Control Building and operate the burners using a computer monitor display.

Movable steel equipment is used on the TA-16-388 Flash Pad to stage the many types of HE-contaminated waste to be treated at the pad. This equipment is constructed to be moved with a forklift and will be stored within the TA-16 Burn Ground Unit. One type of waste treated is large, metallic equipment that has been used for HE machining, handling, transportation, and storage. Several steel pallets are positioned in the middle of the flash pad and the equipment to be treated is set on the steel pallets. The pallets protect the integrity of the concrete pad, preventing deterioration caused by the heat and by mechanical impacts. Thermocouples are placed on and within the equipment being flashed to record temperatures and to document that the materials reached and maintained the required temperature levels for the necessary time. The computer monitoring the flash pad operations records these data.

Much of the noncombustible waste consists of smaller metal items that can be moved by hand. These items are treated in a steel tray, which is lined on the bottom with sand and on the sides with firebrick. The smaller metallic items are positioned in this tray for treatment. After cooling, the items can be reoriented for additional treatment. Thermocouples can be used to verify that the required temperatures have been reached.

Steel trays are also used in treating combustible solids. Cardboard HE storage containers, cloth and paper used to clean HE, packing material for HE, wooden HE packing crates, and rags used to adsorb oil from around HE-processing machines are some of the common combustible materials that must be treated. These materials are stacked on the steel tray and covered with steel screen. The burners are used to thoroughly ignite the material and are then turned off. After about 24 hours, the material is inspected for thorough combustion and burned again, if necessary.

A steel tray, combined with a smaller steel tray, is used to destroy HE contamination in small batches of water-solvent solutions, acids, bases, or oils. These wastes are received in small polyethylene jars packed in a secondary container. These liquids are placed in the smaller tray and the propane-fired burners are used to ignite combustible gases and heat HE to the temperatures necessary for its destruction.

Soil contaminated with explosives, residues from the TA-16-399 HE Burn Tray and the TA-16-401 and 406 Sand Filters that require further treatment, small batches of HE-contaminated activated carbon, and similar contaminated noncombustible particulate matter are also treated at the flash pad. These waste types are placed in a tray that is set on an open frame and covered with a steel plate. This assembly is set in the middle of another tray. Thermocouples are set in the middle of the particulate matter to monitor the temperature.

In addition to the steel pallets and steel trays already described, several other movable steel devices are being considered for use on the flash pad to optimize burning and/or prevent waste compaction. The first device is a cage of expanded steel screen to better contain combustibles during burning. The second device is an apparatus for treating the noncombustible particulate material described above in a more efficient manner. For the second device, one method being considered is to trap the material between two narrowly separated steel plates and heat both plates until the desired temperature is reached. The treated material would then be released into a container and the apparatus would be refilled from a hopper. A second method is to continuously release the material from a hopper, through a flame, and into a container. A third device required may be steel stands on which HE-contaminated pipes are supported. As waste types change, other devices may be needed to effectively treat the wastes.

H.1.1.2 TA-16-388 Burn Tray

The TA-16-388 Burn Tray (Figure H-5) is a stainless-steel kettle with a 75-gallon capacity. The kettle is 30 inches in diameter, is 24 inches high, and stands on legs. Beneath the kettle is a propane ring burner with a heat output of approximately 200,000 BTU/hr. The burner has a steel windshield wrapped around it. Mounted on stands beside the kettle are two flare burners with a heat output of approximately 50,000 BTU/hr each. These burners ignite combustible gases boiled off by the ring burner. The whole assembly sits in a steel secondary containment tank, which is 8 ft in diameter and 1 ft high. The center of the assembly sits 10 ft back from the front of a 20-ft-wide, 40-ft-long concrete pad. Also on the pad is a retractable cover that can be rolled over the burn tray assembly to protect it and the contents from the weather.

The wastes treated at the TA-16-388 Burn Tray range from HE-contaminated solvents, solvent/water mixtures, acids, and bases resulting from HE analysis, processing, maintenance, and cleanup activities. Oils are usually no longer burned in the TA-16-388 Burn Tray because the heating value supplied by the burners is too low to prevent soot formation for most oils.

Instead, oils are usually burned in a small steel tray on the TA-16-388 Flash Pad, where the heating value supplied by the propane burners is much higher. The liquids are either poured into the kettle from 5-gallon carboys or hand-pumped from 55-gallon or other drums. Burn Ground personnel observe the burn tray operations via television monitor. After the liquid contents are evaporated, the residue in the kettle is heated to decomposition temperatures for explosives, as determined by thermocouples attached to the kettle and registered in the Control Building. Although the maximum treatment capacity of the burn tray is listed in the LANL General Part A as 100 gallons and the kettle capacity is 75 gallons, usually only about 5 to 30 gallons of liquid waste is treated in any batch. This quantity represents the amount that can be effectively treated in a single day.

Face shields or other suitable eye protection are worn while liquid is discharged and during cleanup operations when airborne particles constitute an eye hazard. Respirators may be worn when highly hazardous volatile solvents are being handled.

H.1.2 TA-16-399 HE Burn Tray

The TA-16-399 HE Burn Tray is a 4-ft-wide, 16-ft-long steel tray, supported on 1.5-ft-high legs, and lined with firebricks (Figure H-6). The treatment capacity of the TA-16-399 HE Burn Tray is 1,000 pounds of waste per burn. Explosives to be burned, usually rejects from pressing and machining operations and also HE pieces that are no longer useful, are transported to the HE burn tray packed in cardboard and wooden boxes. The boxes are set before the tray one at a time, paper padding is placed on the tray, and the explosives are removed from the boxes and set on the padding. When the surface is covered with HE pieces, usually several hundred pounds, the empty boxes are placed back on the transport vehicle. The padding is then dampened with kerosene, electric matches (squibs) are connected to the firing cables, and a train of excelsior saturated with kerosene is run from the squibs to the padding. All personnel then go to the Control Building and the squibs are fired remotely. The burn is observed by Burn Ground personnel located in the Control Building, using a television camera located near the TA-16-388 structure and a monitor and a periscope located in the Control Building. The day after the HE burn, the ash is inspected for unburned HE or other residues that do not appear to be fully treated. The cover of the TA-16-399 HE Burn Tray is placed over the residue until it can either be treated again on the burn tray or on the TA-16-388 Flash Pad. The existing rolling cover may soon be replaced with a portable cover.

H.1.3 TA-16-401 AND TA-16-406 Sand Filters

The TA-16-401 and TA-16-406 Sand Filters are contained in steel tanks that are 8 ft, 9 inches in diameter and about 4 ft high, about half of which is below ground level (Figure H-7). The base of each has a shallow funnel-shape that is connected to underground pipes leading to the HE Wastewater Treatment Facility's sump tank. The sand filters consist of a gradation of large, smooth river rocks at the bottom to coarse and fine sand on the top. The sand filters perform two vital functions in water treatment. The first is to remove inert and explosive solids that are settled from or are suspended in wastewater. The second is to partially "digest" organic materials in the wastewater using microbes that live among the sand and rock particles. The flow rate through the sand filters is usually only several gallons per minute and it generally takes a day to unload a full truck tank.

Two types of wastes are treated at the sand filters. The first is wastewater in which HE, and possibly trace chemicals associated with HE synthesis and degradation, are in solution. The second is particulate HE saturated with water. Currently, each type of waste is treated in a different filter, the first in the TA-16-406 Sand Filter and the second in TA-16-401 Sand Filter. However, this practice can vary over time and either sand filter can be used for wastewater and/or bulk and particulate HE. The maximum treatment capacity of each sand filter is 1,000 pounds of HE per burn.

The wastewater to be treated comes from holding tanks (sumps) of HE-processing facilities and various types of tanks from environmental restoration and decontamination operations of HE-contaminated solid waste management units. Usually, the wastewater is pumped from the holding tanks into tank trucks operated by Burn Ground personnel, and poured into the TA-16-406 Sand Filter at a rate of several gallons per minute. However, there may be some instances where wastewater is placed in a holding tank near the sand filter and then pumped or gravity fed directly into the filter. Filter socks are tied to the outlet hoses to capture coarse particulate HE. If the water is oily, several pounds of activated charcoal may be added to the filter socks to adsorb oils. Once the filter sock is filled with inert and explosive particles, it is drained and placed on the TA-16-401 Sand Filter. Eventually, the top of the TA-16-406 Sand Filter becomes clogged with fine particles. This fine top layer of sediment is removed and placed in the TA-16-401 Sand Filter. Clean sand is then placed on the surface of the TA-16-406 Sand Filter.

Water-saturated explosives are placed in the TA-16-401 Sand Filter. These water-saturated HE wastes come from several sources. The first source is the HE-production facilities or environmental restoration activities where HE-containing wastewater is pre-filtered. When the pre-filters are full, the contents or the entire filter are placed into plastic buckets. After a sufficient number of buckets have been accumulated at less-than-90-day storage areas or satellite accumulation areas, or the accumulation limit for the buckets is about to expire, the buckets are moved from the storage or accumulation sites to the TA-16-401 Sand Filter, where their contents are spread out on the sand filter surface. Similarly handled is the HE that is collected during environmental restoration or building decontamination/decomissioning activities. It is placed into buckets with water and stored in accumulation areas until treated by OB. Another source of wet HE is the HE sludge at the bottom of the various holding tanks, or sumps. After the wastewater is removed for treatment, the sludge remaining in the sumps is periodically vacuumed into tank trucks and poured into the TA-16-401 Sand Filter. Because the operations and capacities of the sand filters are similar to those of the TA-16-399 HE Burn Tray, the sand filters can be used to treat bulk HE if the TA-16-399 HE Burn Tray is not operational. There may be other sources of HE generated in the future that will be treated at the sand filters.

After the HE has been placed in a sand filter, a heavy steel lid is then placed over the filter to restrict access to the wastes and shield them from initiating sources. When a sufficient amount of HE wastes have been accumulated in the TA-16-401 Sand Filter, the steel lid is tightly sealed to the sand filter tank using screw clamps. The contents of the sand filter are then dried with heated forced air for 4 or 5 days. The dried contents are then damped with kerosene and ignited remotely using the same procedure as used at the TA-16-399 HE Burn Tray. The burn is observed remotely by Burn Ground personnel using television cameras located near the sand filters, and a monitor and a periscope located in the Control Building. The TA-16-401 Sand Filter is used principally for burning because it is not as close to trees as the TA-16-406 Sand Filter and the area around the TA-16-401 Sand Filter is easily kept mowed. During seasonal dry periods, a wide area around the TA-16-401 Sand Filter is wetted down prior to treatment.

H.2 OPERATIONAL AND WASTE MANAGEMENT PRACTICES

The Burn Ground Unit treats only hazardous solid and liquid wastes that are either pure HE or contaminated with HE. This section describes the operational and waste management practices used to stage and treat the waste, as well as the disposition of residues. Information on treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; preparedness and prevention; and volatile organic air emissions standards are also presented herein. The waste streams treated at the unit are described in Table B-6 of Appendix B in the "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0 (LANL, 1998b), hereinafter referred to as the LANL General Part B.

H.2.1 General Burning Procedures

Treatment of hazardous waste at the TA-16 Burn Ground Unit is conducted using a non-continuous [batch] thermal treatment process, in accordance with the requirements specified in 20 NMAC 4.1, Subpart VI, 265.373 [1-1-97]. Open burning of wastes at the TA-16 Burn Ground Unit will be conducted in a manner that does not threaten human health or the environment. Prior to OB operations at the Burn Ground Unit, the area is cleared of all but authorized Burn Ground personnel. A barrier is placed across the road to prevent entry.

The closest property not owned by LANL is at a distance greater than one mile from the Burn Ground Unit. Therefore, a safe distance is maintained between the HE burn sites and the property of others, as required in 20 NMAC 4.1, Subpart VI, 265.382 [1-1-97].

The master controls for each of the Burn Ground Unit structures' firing circuits are located inside the Control Building. The Control Building is no less than 300 ft from all OB operations. Operational procedures require that OB not be undertaken at a time of impending electrical storms and during high wind conditions. OB may also be restricted during periods of high fire danger and adverse atmospheric conditions. The NMED's Air Quality Bureau determines the conditions under which OB can occur. All OB operations are conducted in accordance with appropriate standard operating procedures (SOP). Adherence to the SOPs ensures safe and efficient HE destruction and decontamination of flashed materials.

H.2.2 Waste Staging

Waste staging varies by treatment process. The factors influencing how wastes are staged are safety, the degree of difficulty in placing or removing wastes from a Burn Ground Unit structure, and the influence of weather conditions. The staging procedures by structure are described below.

Bulk HE treated at the TA-16-399 HE Burn Tray is initially accumulated in less-than-90-day storage areas and satellite accumulation areas until the day of treatment. Safety concerns dictate that HE be immediately burned after arriving at the Burn Ground. If it cannot be burned immediately, the HE is staged temporarily in a rest house or magazine.

Because the amount of liquid waste treated at the TA-16-388 Burn Tray is small and staging of this waste does not involve complicated collection and transport procedures, the waste to be treated is transported from less-than-90-day storage areas and satellite accumulation areas just before a planned burn. It is usually possible to ensure that the environmental conditions (e.g., wind speed, fire conditions) required by the NMED Air Quality Bureau can be met before the waste is staged. In the event of an unforeseen delay, the waste is covered until it can be burned.

The most difficult waste to stage is that treated at the TA-16-388 Flash Pad. The wastes are accumulated in less-than-90-day storage areas and satellite accumulation areas until several days before flashing. Depending on the size and amount of waste to be flashed, it may take several days to stage the waste on the structure. The waste material to be treated may include relatively large quantities that involve extensive scheduling of collection and transport resources, may require equipment such as cranes or additional procedures for lifting of large pieces, and require complicated stacking arrangements on removable steel supports. Because the staging of this material is complex, it may not always be possible to ensure that the environmental conditions required by the NMED Air Quality Bureau are going to be present at the scheduled burn time. If burning is delayed, the retractable cover is rolled over the waste pile.

The TA-16-401 and TA-16-406 Sand Filters are used to treat HE-contaminated wastewater and the HE filtrate accumulates over a number of days. Wet bulk and particulate HE is transported to the sand filters from less-than-90-day storage areas and satellite accumulation areas just before the filters are covered for drying. Several days prior to burning, the filters are sealed and

the forced-air heater is activated to dry the HE. The HE is burned as soon as environmental conditions allow.

H.2.3 Waste Management Practices [20 NMAC 4.1, Subpart V, Part 264, Subpart X]

The wastes treated are both homogeneous (e.g., solid explosives, scrap explosives) and heterogeneous (e.g., excess equipment, remediation debris). The waste streams are described in Appendix B of the LANL General Part B. The wastes are treated to remove the characteristic of reactivity, although other characteristic and listed hazardous waste may be present in the wastes being treated. Whereas burning will treat a number of waste constituents (e.g., HE, solvents), metals will not be destroyed. They will remain in the residues, which are sampled and analyzed. If hazardous, the residues are sent to an appropriate permitted facility for treatment/disposal. HE-contaminated wastes may be treated at the TA-16 Burn Ground Unit to desensitize or declassify the waste. Components of the Burn Ground Unit structures (e.g., burn trays, steel plates) consist of nonhazardous materials only (e.g., steel).

Waste containers for small pieces of explosives-contaminated waste and explosive material generally consist of plastic bags, 55-gallon drums, 30-gallon carboys, or paper-lined cardboard boxes. The waste will be placed within a container, sealed, and labeled appropriately. These waste containers will then be stored in a less-than-90-day storage area or a satellite accumulation area. Pieces of waste that cannot fit into boxes or drums (e.g., large equipment and debris) are stored in movable storage bins, such as covered roll-off bins. These bins are designated as less-than-90-day accumulation areas. They can be transported directly to the TA-16 Burn Ground Unit for staging and subsequent treatment of the waste.

Waste to be treated is collected from various less-than-90-day storage areas and satellite accumulation areas at the facility. When loading waste, the cargo compartment of the transport vehicle(s) is checked to ensure that it is clean and contains no loose items such as tools or pieces of metal. For transport, the wastes are placed in an enclosed compartment or secured with tie-downs. The load limit for transporting explosives is determined by the capacity of the transport vehicle(s). Wastes are transported by appropriately trained personnel in a designated vehicle(s) to the TA-16 Burn Ground. The waste is unloaded from the vehicle(s) and placed at the Burn Ground Unit structure by qualified technicians/specialists. A visual examination is conducted after unloading to ensure that no explosive material remains in the transport vehicle(s).

Ash from all OB operations is sampled either before or after being placed in drums. The drums are stored in a less-than-90-day storage area, pending sample analysis. The ash is then sent off site for disposal or for further treatment, based on the analytical results and on the original U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers assigned to the waste before treatment. Scrap metal that is free of HE is sent off site for recycling. Other residues are disposed as New Mexico Special Waste in accordance with 20 NMAC 9.1 in a landfill licensed to accept these wastes.

LANL minimizes the impact to the environment by conducting treatment operations in strictly controlled, remote areas within the LANL boundaries. Treatment operations are not conducted during adverse conditions to minimize wind dispersal of ash and particulate matter to the environment.

H.2.4 Treatment Effectiveness [20 NMAC 4.1, Subpart IX, 270.23(d)]

To address the applicable miscellaneous unit requirement specified in 20 NMAC 4.1, Subpart IX, 270.23(d) [1-1-97], a demonstration of treatment effectiveness must be included for the TA-16 Burn Ground Unit. As indicated in the U.S. Army Environmental Hygiene Agency (AEHA) guidance document titled "RCRA Part B Permit Writer's Guidance Manual for Department of Defense Open Burning/Open Detonation Units" (AEHA, 1987), a demonstration of treatment effectiveness can be based on laboratory or field data. For wastes treated by OB, information demonstrating that any residues remaining after burning are not reactive (i.e., as defined by the Resource Conservation and Recovery Act [RCRA]) should be provided. At the TA-16 Burn Ground Unit structures, this is accomplished by testing the residue for HE. If HE is present in the residue, it is treated again.

H.2.5 Ignitable, Reactive, and Incompatible Wastes [20 NMAC 4.1, Subpart V, 264.17(a)]

Applicable requirements for the management of ignitable, reactive and incompatible wastes at the TA-16 Burn Ground Unit are addressed in Section 2.2.5 of this permit renewal document. This information is provided to meet the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(9), and 20 NMAC 4.1, Subpart V, 264.17(a) and (b) [1-1-97].

H.2.6 Security and Access [20 NMAC 4.1, Subpart IX, 270.14(b)(4) and 270.14(b)(19)(viii); 20 NMAC 4.1, Subpart V, 264.14]

The following describes the security features in place at the TA-16 Burn Ground Unit in accordance with the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(4) and 270.14(b)(19)(viii), and 20 NMAC 4.1, Subpart V, 264.14 [1-1-97].

After clearing non-authorized personnel from the Burn Ground Unit, a barrier is placed across the road before OB operations to reduce the possibility of entry into this area. In accordance with 20 NMAC 4.1, Subpart IX, 270.14(b)(19)(viii) [1-1-97], the locations of the security fence and access gates at TA-16 are shown on Figure A-11 of Attachment A. (The locations of fences and gates are subject to change.) Collectively, these security procedures and the security features discussed below prevent the unknowing entry and minimize the possibility for unauthorized entry of persons into the unit, in accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.14(b)(2) [1-1-97].

The TA-16 Burn Ground Unit is located within a secured area at which security is maintained through both administratively-controlled and physical barriers. Access to the area can only be gained through controlled entry stations by persons possessing appropriate security clearance and site-specific training. Stations located on Anchor Ranch Road and access off of West Jemez Road (State Road 501) are controlled by Protection Technology Los Alamos (PTLA) security personnel or by badge and palm readers 24 hours a day. In addition, entry into the burn ground is through an industrial fence with access granted through an ESA-controlled station. PTLA security personnel inspect security fences on a regular basis, and repairs are made as necessary. Warning signs are posted at the entrance to the unit area and can be seen by personnel approaching the area. The legend on the signs indicates "Danger Explosives Area." Signs reading "Authorized Personnel Only" are posted on the HE Exclusion Area access gates. All warning signs are legible from a distance of 25 ft and are written in English and Spanish.

H.2.7 Preparedness and Prevention Requirements [20 NMAC 4.1, Subpart V, Part 264, Subpart C]

The following sections present how operations at the TA-16 Burn Ground Unit comply with the preparedness and prevention requirements of 20 NMAC 4.1, Subpart V, Part 264, Subpart C [1-1-97].

H.2.7.1 Required Equipment [20 NMAC 4.1, Subpart V, 264.32]

In accordance with the requirements of 20 NMAC 4.1, Subpart V, 264.32 [1-1-97], the TA-16 Burn Ground Unit is equipped with adequate emergency equipment, which includes internal and external communication equipment, alarm systems, fire extinguishers, and fire control and decontamination equipment. Emergency equipment specific to the unit is discussed in the following sections and is summarized in Table E-2 in Attachment E of this permit renewal document. LANL-wide emergency equipment available for use at any of the LANL waste management units is presented in Appendix E of the LANL General Part B.

H.2.7.2 Testing and Maintenance of Equipment [20 NMAC 4.1, Subpart V, 264.33]

Communications and alarm systems and fire protection and decontamination equipment associated with the unit are tested and/or maintained according to the inspection schedule detailed in Appendix C of the LANL General Part B. The frequency of inspection is adequate to assure proper operation in the event of an emergency. Repair and replacement of emergency equipment are performed, as needed.

H.2.7.3 Access to Communications or Alarm Systems [20 NMAC 4.1, Subpart V, 264.34]

Whenever treatment operations are being conducted at the unit, involved personnel have immediate access to an emergency communication device, either directly or through visual or voice contact with another individual. In the event of an emergency, two-way radios, pagers, and/or telephones allow personnel to contact the operating group management, the Emergency Management and Response Office, and/or the Central Alarm Station operator (refer to Appendix E of the LANL General Part B).

H.2.7.4 Space Requirements [20 NMAC 4.1, Subpart V, 264.35]

Adequate space is maintained at the TA-16 Burn Ground Unit to allow the unobstructed movement of personnel and fire protection, spill control, and decontamination equipment in the event of an emergency.

H.2.7.5 Support Agreements with Outside Agencies [20 NMAC 4.1, Subpart V, 264.37]

Information on support agreements with outside agencies, as required by 20 NMAC 4.1, Subpart V, 264.37 [1-1-97], is presented in Section 2.0 of the LANL General Part B.

H.2.7.6 Preventive Procedures, Structures, and Equipment [20 NMAC 4.1, Subpart IX, 270.14(b)(8)]

Descriptions of the preventive procedures, structures, and equipment at the unit are presented below. This information is provided in accordance with the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(8) [1-1-97]. Adherence to the procedures and proper use of the structures and equipment will help to prevent hazards, prevent undue exposure of personnel to hazardous waste, and prevent releases to the environment.

At the TA-16 Burn Ground Unit, large pieces of explosives-contaminated waste or explosive materials are typically handled using mechanical equipment such as a truck-mounted crane or a hydraulic lift gate. Small containers of waste are handled manually or with a dolly. The use of proper handling equipment, appropriate to the size and weight of the waste item, helps to prevent hazards while moving waste at the unit. Additionally, personnel involved in waste handling and container handling operations at the unit are knowledgeable of the physical and chemical properties of the waste managed at the site and take additional precautions, as necessary, to ensure that wastes are handled safely.

Pursuant to the requirements of 20 NMAC 4.1, Subpart IX, 270.14(b)(19)(xi) [1-1-97], Figure A-8 in Attachment A shows surface contours and drainage around the unit. Engineering controls are in place at the unit to prevent runoff of wastes from the unit to other areas of the facility or to the environment (see Figure A-13 in Attachment A).

It is not anticipated that there will be any impact to groundwater or other water supplies as a result of treatment operations at the unit because engineering and operational controls ensure that run-on and runoff are minimized. The TA-16-388 Flash Pad and Burn Tray are equipped with retractable covers and secondary containment to prevent run-on and runoff. The TA-16-399 HE Burn Tray is equipped with a movable cover to prevent run-on into this structure. The TA-16-401 and TA-16-406 Sand Filters are both equipped with lids and are connected to the HE Wastewater Treatment Facility.

Electrical power is supplied to the Control Building. Supplied power at this building is used to operate lighting, telephone, alarm, and monitoring systems. Operations at the unit would be discontinued temporarily if electrical power was not restored quickly.

Safety shoes, safety glasses, and other personal protective equipment (PPE) required in explosives areas are worn by workers during routine operations at the unit. Additional appropriate PPE is available should abnormal or unusual conditions require such equipment.

Releases to the atmosphere resulting from treatment activities at the unit cannot be prevented. However, impacts are kept to a minimum through operating practices and burning under appropriate atmospheric conditions. Air releases from OB operations are regulated by the NMED's Air Quality Bureau under 20 NMAC 2.60. The regulation of air impacts is discussed further in Section H.3.3.

H.2.7.7 Prevention of Accidental Ignition or Reaction of Ignitable, Reactive, or Incompatible Waste [20 NMAC 4.1, Subpart IX, 270.14(b)(9), 270.15(c) and (d) and 20 NMAC 4.1, Subpart V, 264.17]

This section details the precautions taken to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes at the TA-16 Burn Ground Unit.

Ignitable or reactive wastes are or will be located at least 50 feet from the facility's property line at all times and will be protected from sources of ignition or reaction. Smoking is not permitted in areas where wastes are managed. A sign indicating "No Smoking Except in Designated Areas" is conspicuously placed at the entrance to the unit, as required by 20 NMAC 4.1, Subpart V, 264.17(a) [1-1-97]. Together, these measures meet the requirements of 20 NMAC 4.1, Subpart V, 264.17(a) and (b) and 264.176 [1-1-97].

Incompatible wastes, if managed at the unit, are segregated to prevent adverse reactions from occurring through commingling of the wastes. 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 NMAC 4.1, Subpart V, 264.177(a) and (b), and 20 NMAC 4.1, Subpart IX, 270.15(d) [1-1-97]. If incompatible wastes are managed at the unit, the requirements of 20 NMAC 4.1, Subpart V, 264.177(c) [1-1-97], will also be met. Only containers made of or lined with materials that will not react with and are otherwise compatible with the waste to be managed will be used at the unit.

H.2.8 Volatile Organic Air Emission Standards [40 CFR, Part 264, Subpart CC]

The TA-16 Burn Ground Unit is a Subpart X unit; there are no Subpart J tanks or Subpart K surface impoundments at TA-16. The hazardous wastes staged in containers at the TA-16 Burn

Ground Unit may be subject to 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 EPA, require that containers of hazardous waste be covered so there are no detectable emissions. LANL requires that Subpart CC requirements for container management be met by the generator. There are no Subpart CC-regulated liquids generated during OB operations.

H.3 ENVIRONMENTAL PERFORMANCE STANDARDS [20 NMAC 4.1, Subpart V, 264.601]

The TA-16 Burn Ground Unit is located in a remote area of LANL. The unit will be operated, maintained, and closed in a manner that will ensure protection of human health and the environment, in accordance with 20 NMAC 4.1, Subpart V, 264.601 [1-1-97]. Geologic and hydrologic characteristics of the LANL facility and land use patterns in the Los Alamos area are discussed in Section 2.0 of the LANL General Part B.

The TA-16 Burn Ground Unit has been designed to facilitate safe handling and treatment of wastes in order to prevent adverse human health and environmental impacts. Design information and waste management practices for this unit are detailed in Sections H.1 and H.2 of this attachment. The waste analysis plan for this unit is included as Appendix B of the LANL General Part B. A description of emergency response actions to be taken to minimize adverse impacts of unanticipated events are described in Attachment E of this document and Appendix E of the LANL General Part B.

H.3.1 Protection of Groundwater/Vadose Zone [20 NMAC 4.1, Subpart V, 264.601(a)]

The TA-16 Burn Ground Unit is located in a semiarid, temperate, mountain climate. The average annual precipitation in Los Alamos is 18.73 inches (LANL, 1996). The evaporation rate of free-standing water exceeds the average annual precipitation. It is estimated that 600 to 1,200 ft of unsaturated tuff and volcanic rock separate the facility's soil surface from the regional aquifer. Collectively, the depth to the uppermost aquifer and the annual moisture deficit significantly limit the potential for contaminants resulting from Burn Ground Unit operations to migrate through the vadose zone to groundwater. The only aquifer in Los Alamos capable of municipal and industrial water supply is the regional aquifer. No supply wells or test wells are located within the boundary of TA-16 or within 3,500 ft of the TA-16 Burn Ground Unit. Supplement H-1 provides hydrologic information and presents a conservative scenario to

evaluate possible waterborne waste transport pathways and their potential for contaminant migration for the TA-16 Burn Ground.

A detailed description of the hydrogeologic characteristics immediately below the TA-16 Burn Ground is not currently documented in published or internal reports. However, the NMED's August 17, 1995, letter to the U.S. Department of Energy (DOE) Los Alamos Area Office (see Supplement H-2) required LANL to develop a RCRA site-wide hydrogeologic workplan and to submit this workplan to the NMED and the EPA for review and approval. Part of the workplan objective was to address RCRA groundwater monitoring requirements for regulated units; implementation of the plan will also provide information on the hydrology below the Burn Ground Unit at TA-16. The “Hydrogeologic Workplan” (HWP) was developed as a comprehensive, facility-wide approach rather than a unit-by-unit program. The most recent HWP (LANL, 1998c) was prepared and submitted to the NMED in December 1996, and was approved in March 1998. The R-25 well, located just west of the Burn Ground Unit, was drilled in 1999 as part of the HWP. Reports on the findings from this project should be published in 2000, and will be submitted to the NMED as part of the HWP agreement.

H.3.2 Protection of Surface Water/Wetlands and the Soil Surface [20 NMAC 4.1, Subpart V, 264.601(b)]

Net annual precipitation for the Los Alamos area, including the site of the TA-16 Burn Ground Unit, is low. In addition, surface waters within LANL are limited to ephemeral, interrupted, or intermittent flows in the canyon bottoms that result from rainfall or snowmelt. The locations of these surface waters, including intermittent streams, are shown on Figure A-8 in Attachment A. There are no wetlands near the TA-16 Burn Ground Unit.

The TA-16 Burn Ground Unit is part of the University of California/DOE National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for storm water discharges associated with industrial activity (current Permit Numbers NMR05A509 and NMR05A510, effective January 1, 1999). A Storm Water Pollution Prevention (SWPP) Plan, as required by the NPDES Multi-Sector General Permit and the Baseline General Permit, has been developed for the TA-16 Burn Ground. The plan is designed to identify any potential pollutants and to provide pollution prevention or control methods to prevent the discharge of pollutants in storm water runoff at the unit and the surrounding area. Under the SWPP Plan, the facility is required to implement best management practices to reduce the likelihood of pollutants entering the storm water discharges. The plan includes storm water run-on/runoff measures for active units

as well as erosion control (e.g., rock check dams) to prevent dispersion of legacy contamination and sediments (see Figure A-13 in Attachment A).

Water quality data collected in Cañon de Valle since 1994 shows barium and RDX (a form of HE) at levels above New Mexico State Drinking Water standards. Barium concentrations are less than 4 parts per million and RDX is less than 200 parts per billion. Levels in water and sediment do not increase downstream from the TA-16 Burn Ground, suggesting that the Burn Ground is not the principal source of these surface water contaminants. Supplement H-1 provides additional hydrologic information and presents a conservative scenario to evaluate possible waterborne waste transport pathways and their potential for contaminant migration for the TA-16 Burn Ground. To maintain compliance with the NPDES Multi-Sector General Permit, site inspections and an annual compliance evaluation are conducted at the TA-16 Burn Ground to evaluate the effectiveness of the SWPP Plan. The compliance evaluations are documented in a report that describes any major observations, incidents of noncompliance with the SWPP Plan, corrective actions, and any observations or changes made with respect to the SWPP Plan.

Stormwater monitoring for this operation is conducted using LANL's Storm Water Monitoring Station Network. Monitoring station E262 is located at the confluence of Cañon de Valle and Water Canyon and is directly downstream of the Burn Ground. This station was installed in 1999 and was in operation during the last two quarters of Fiscal Year (FY) 99. Precipitation during this time did not produce runoff at this station. Therefore, additional stations to sample the discharges leaving the area are proposed for installation by LANL in FY 00.

Potential impacts to soils from ongoing operations are minimized through the waste management practices described in Section H.2, and with the storm water run-on and runoff controls described in Section 2.2.7. Supplement H-1 evaluates the potential impact to the soil surface from a spill at the TA-16 Burn Ground, using a worst-case scenario developed for TA-16-387, a former OB flash pad in the vicinity of the TA-16 Burn Ground Unit.

H.3.3 Protection of the Atmosphere

The predominant exposure pathway for OB of reactive wastes is inhalation of airborne products of complete and incomplete combustion. The NMED's Air Quality Bureau regulates the air emissions from the Burn Ground Unit under a permit issued under 20 NMAC 2.60, "Open Burning" (current Permit No. AQB.97.214, effective August 18, 1997). To obtain a permit under

20 NMAC 2.60, LANL was required to submit a permit application containing the following information for this pathway:

- The type and quantity of material to be burned. This meets the requirements of 20 NMAC 4.1, Subpart V, 264.601(c)(1) [1-1-97];
- The methods that will be used to ignite, maintain, and control the burning. This meets the requirements of 20 NMAC 4.1, Subpart V, 264.601(c)(3) [1-1-97]; and
- An ambient air quality impacts analysis at the nearest off-site receptor modeled with a gaussian plume model using site-specific meteorology, topography and worst-case emissions estimates. This meets the requirements of 20 NMAC 4.1, Subpart V, 264.601(c)(4) [1-1-97].

The NMED's open burning program recognizes that the systems and structures to prevent emissions of hazardous constituents are not the same as other types of sources because engineering controls are not appropriate. Instead, the program evaluates the methods of burning and relies on burning under good atmospheric dispersion conditions to minimize hazardous emissions impact. Thus, this program also meets the requirements of 20 NMAC 4.1, Subpart V, 264.601(c)(2) [1-1-97]. Burning must take place under atmospheric conditions (e.g., stability and wind speed/direction) that favor dispersion. However, winds cannot be so high that significant amounts of ash would become windborne. Figures A-9 and A-10 in Attachment A of this permit renewal document show the wind roses for TA-6 and TA-49, where the wind observation towers closest to the TA-16 Burn Ground Unit are located.

Beginning in 1990, the National Park Service, the NMED, and LANL jointly ran an ambient air quality monitoring station at the nearest off-site receptor, Bandelier National Monument. This monitoring site was located very near TA-16 for three (3) years. This station showed the background air to have only very low levels of pollution. NMED's Air Quality Bureau used this information and the impacts assessment, combined with knowledge of local air quality conditions, to ensure that air quality standards would not be exceeded. Air quality standards are set to protect human health (primary standards) and welfare (secondary standards). Secondary standards take into account the health and ecological impacts to domestic animals, wildlife, crops, vegetation, and physical structures. This part of the open burning program meets the requirements of 20 NMAC 4.1, Subpart V, 264.601(5), (6), and (7) [1-1-97]. Based on the clean condition of ambient air and the low impacts of burning, the Air Quality Bureau has not required monitoring of open burning at the TA-16 Burn Ground.

H.4 REFERENCES

AEHA, 1987, "RCRA Part B Permit Writers' Guidance Manual for Department of Defense Open Burning/Open Detonation Units," U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland.

LANL, 1998a, "Los Alamos National Laboratory General Part A Permit Application," Revision 0.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998b, "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0, Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1998c, "Hydrogeologic Workplan," Los Alamos National Laboratory, Los Alamos, New Mexico.

LANL, 1996, "Environmental Surveillance at Los Alamos during 1995," LA-13210-ENV, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table H-1

Miscellaneous Unit Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Renewal Document
∋264.601(a)	Prevention of release of contaminants to groundwater	Attachment H
∋264.601(a)(1)	Volume and characteristics of waste considering potential for migration through containing structures	2.0, Attachment H
∋264.601(a)(2)	Hydrologic/geologic characteristics	Attachment H, Supplement H-1
∋264.601(a)(3)	Quality of groundwater including other sources of contamination and their cumulative impact on groundwater	Attachment H
∋264.601(a)(4)	Quantity and direction of groundwater flow	Attachment H
∋264.601(a)(5)	Proximity to and withdrawal rates of potential groundwater users	Attachment H
∋264.601(a)(6)	Regional patterns of land use	Attachment A
∋264.601(a)(7)	Potential for deposition and migration of waste constituents	Attachment H, Supplement H-1
∋264.601(a)(8)	Potential for health risks caused by human exposure to waste constituents	Attachment H
∋264.601(a)(9)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Attachment H
∋264.601(b)	Prevention of release of contaminants to surface water	Attachment H
∋264.601(b)(1)	Volume and characteristics of the waste	2.0, Attachment H
∋264.601(b)(2)	Effectiveness and reliability of containment, confinement, and collection systems and structures	2.0, Attachment H
∋264.601(b)(3)	Hydrologic characteristics of the unit and local area	Attachment H, Supplement H-1
∋264.601(b)(4)	Regional precipitation patterns	Attachment H, Supplement H-1
∋264.601(b)(5)	Quantity, quality, and direction of groundwater flow	Attachment H
∋264.601(b)(6)	Proximity of the unit to surface water	Attachment A, Attachment H
∋264.601(b)(7)	Current and potential uses of nearby surface waters and water quality standards for those waters	Attachment H
∋264.601(b)(8)	Quality of surface waters and soils including other sources of contamination and their cumulative impact on surface waters and soils	Attachment H, Supplement H-1

Refer to footnote at end of table.

Table H-1 (Continued)

Miscellaneous Unit Regulatory References and Corresponding Permit Renewal Document Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Renewal Document
∋264.601(b)(9)	Regional patterns of land use	Attachment A
∋264.601(b)(10)	Potential for health risks caused by human exposure to waste constituents	Attachment H
∋264.601(b)(11)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Attachment H
∋264.601(c)	Prevention of release of contaminants to air	Attachment H
∋264.601(c)(1)	Volume and characteristics of waste including its potential for emission	2.0, Attachment H
∋264.601(c)(2)	Effectiveness and reliability of systems/structures to reduce/prevent emissions of hazardous constituents to the air	2.0, Attachment H
∋264.601(c)(3)	Operating characteristics of the unit	2.0, Attachment H
∋264.601(c)(4)	Characteristics of the unit and the surrounding area	2.0, Attachment H
∋264.601(c)(5)	Existing quality of the air including other sources of contaminants and their cumulative impact on the air	Attachment H
∋264.601(c)(6)	Potential health risks caused by human exposure to waste constituents	Attachment H
∋264.601(c)(7)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Attachment H
∋264.602	Monitoring, analysis, inspection, response, reporting, and corrective action	2.0, 4.0, Attachment H
∋264.603	Post-closure care	Attachment F.2[a]
∋264.15	General inspection requirements	Attachment C[a]
∋264.33	Testing and Maintenance of Equipment	Attachment H
∋264.75	Biennial report	2.0
∋264.76	Unmanifested waste report	2.0
∋264.77	Additional reports	2.0
∋264.101	Corrective action for solid waste management units	4.0

[a] Requirement or information is also addressed in the "Los Alamos National Laboratory General Part B Permit Application," Revision 1.0 (LANL, 1998a), as appropriate.

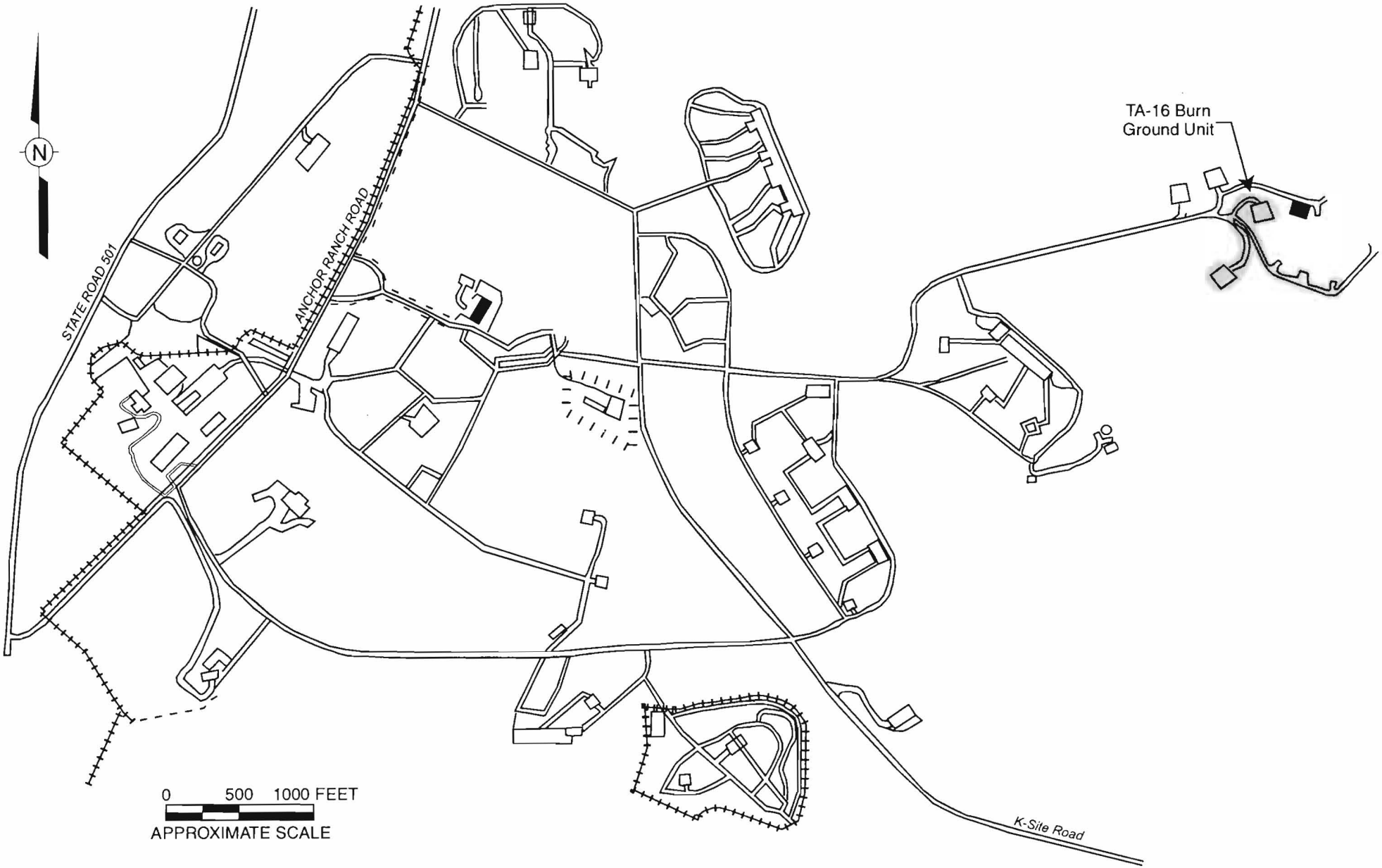

Figure H-1
Site Location Map for Technical Area (TA) 16 Burn Ground Unit

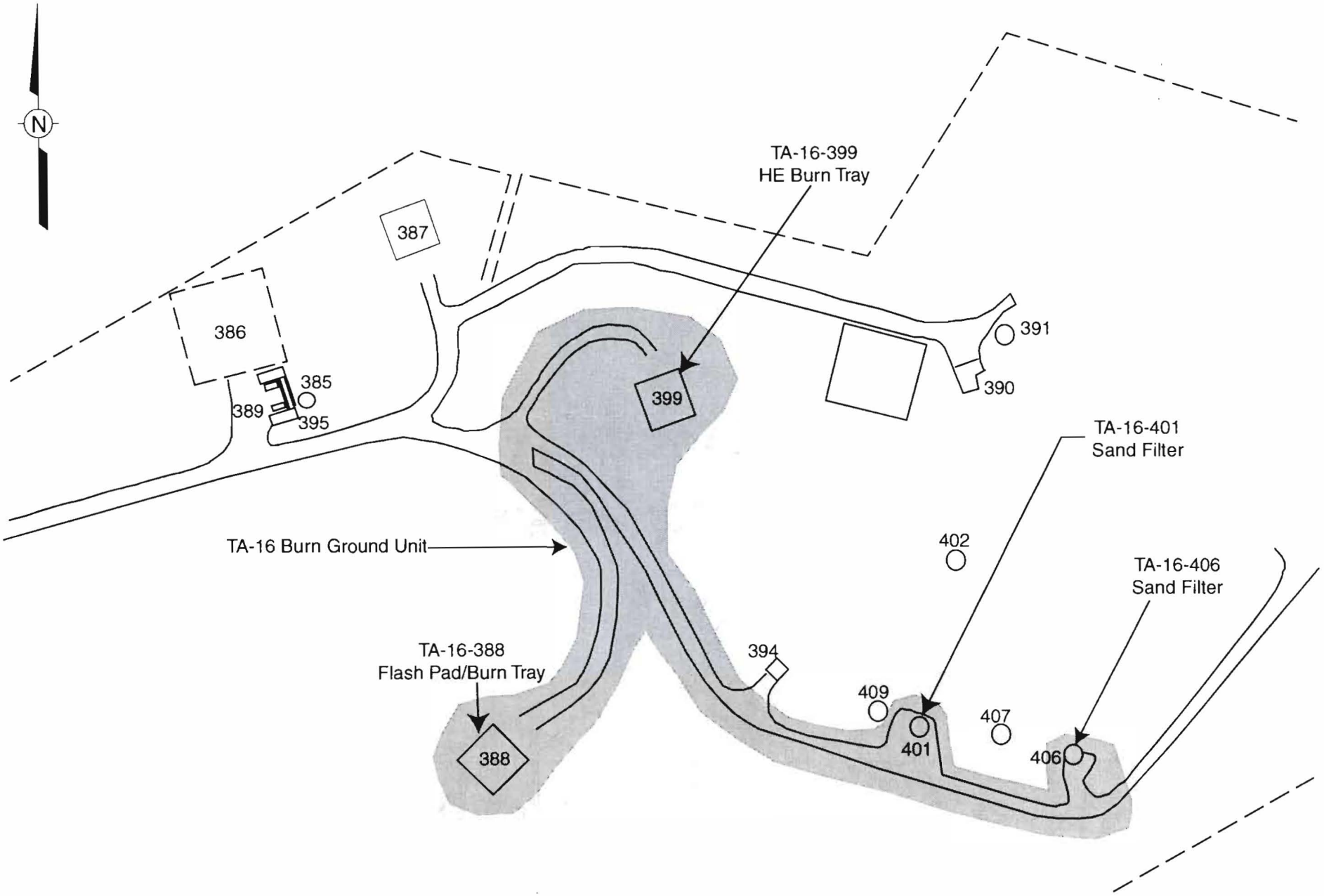

Figure H-2
Technical Area (TA-16) Burn Ground Unit

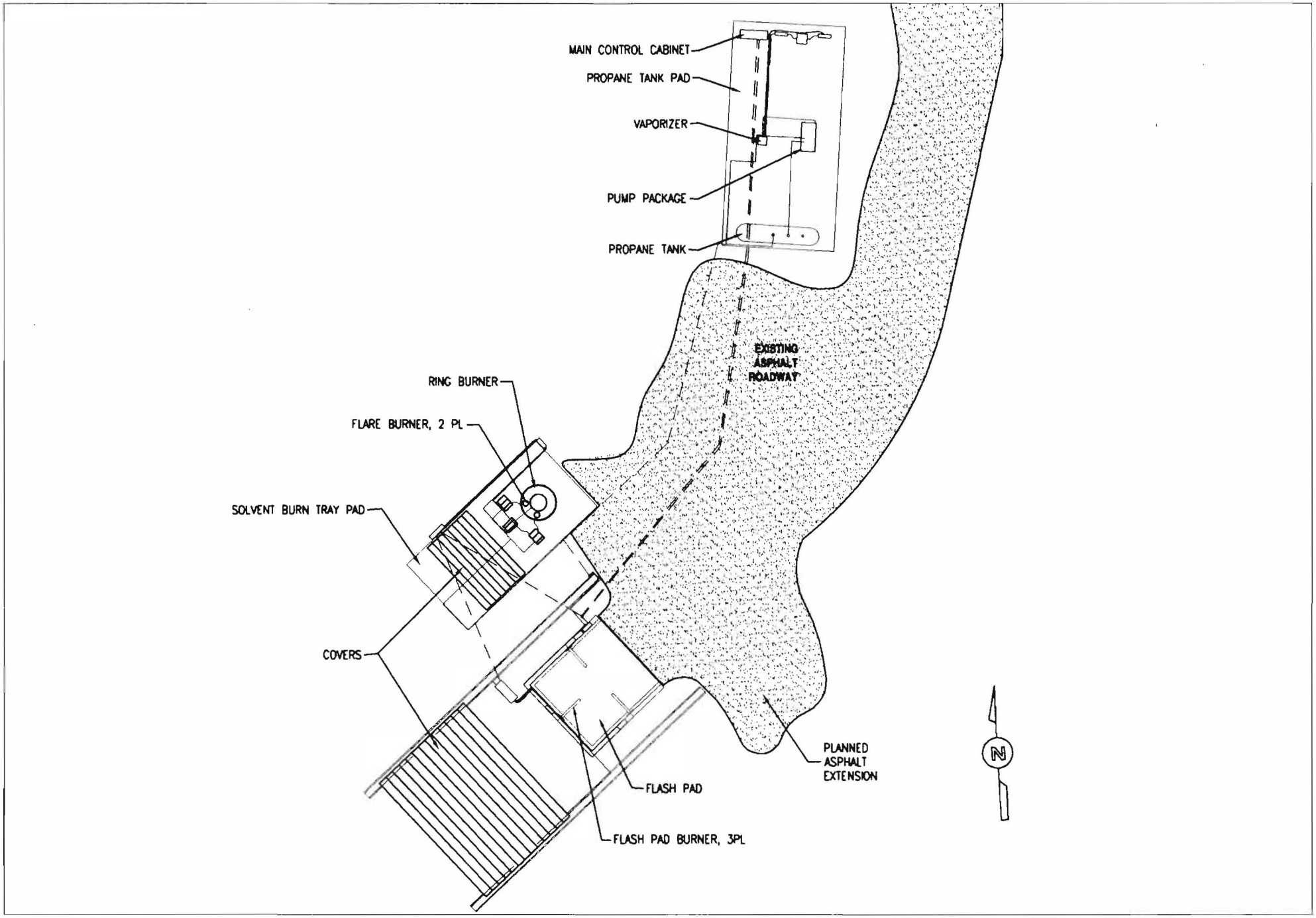

Figure H-3

Technical Area (TA) 16-388 Flash Pad/Burn Tray

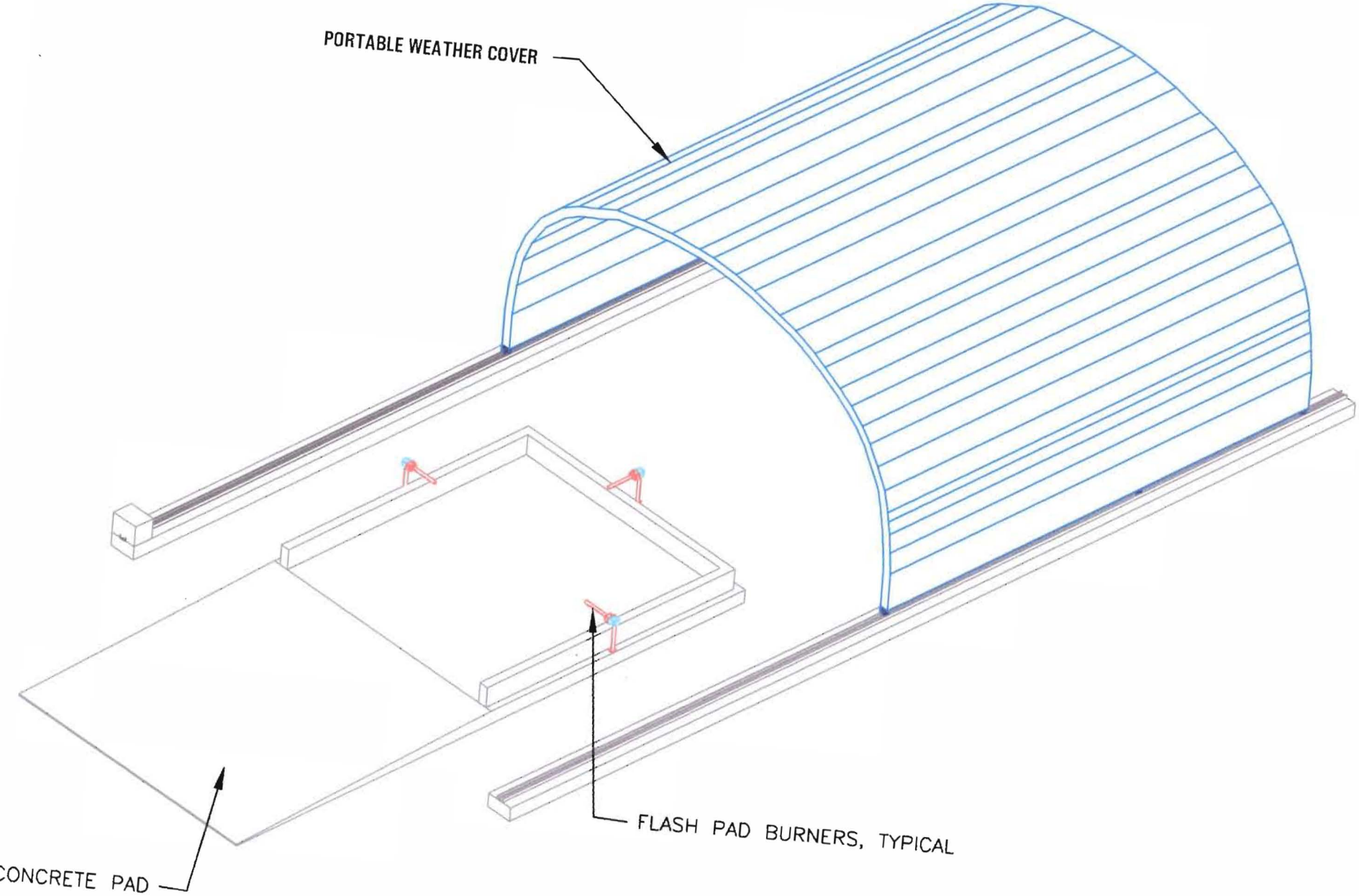

Figure H-4
Technical Area (TA) 16-388 Flash Pad

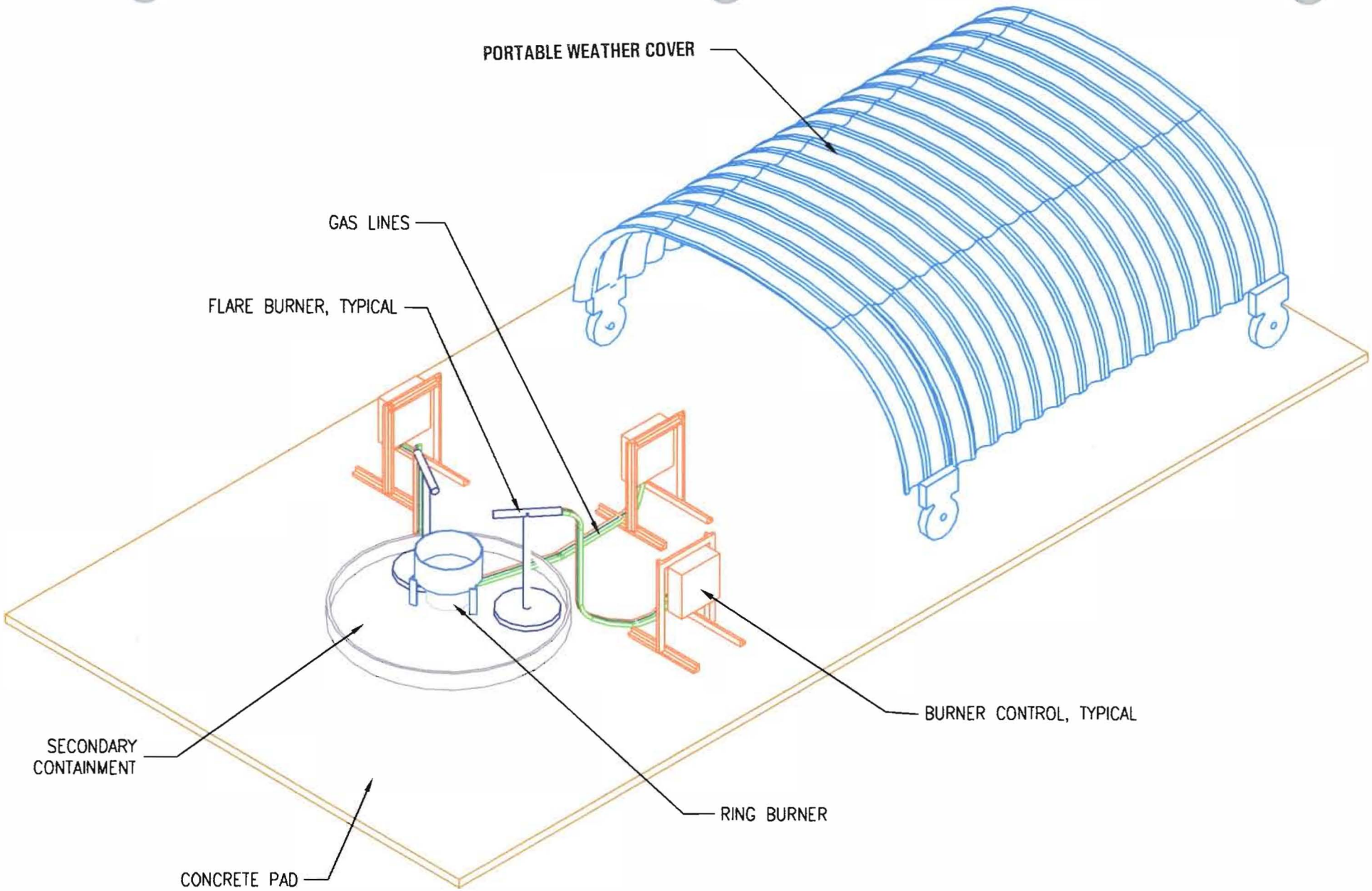

Figure H-5

Technical Area (TA) 16–388 Burn Tray

NOTE:
THE BURN TRAY IS METAL & LINED WITH FIRE BRICK

ED HYDE
NEW MEXICO
10404
REGISTERED PROFESSIONAL ENGINEER

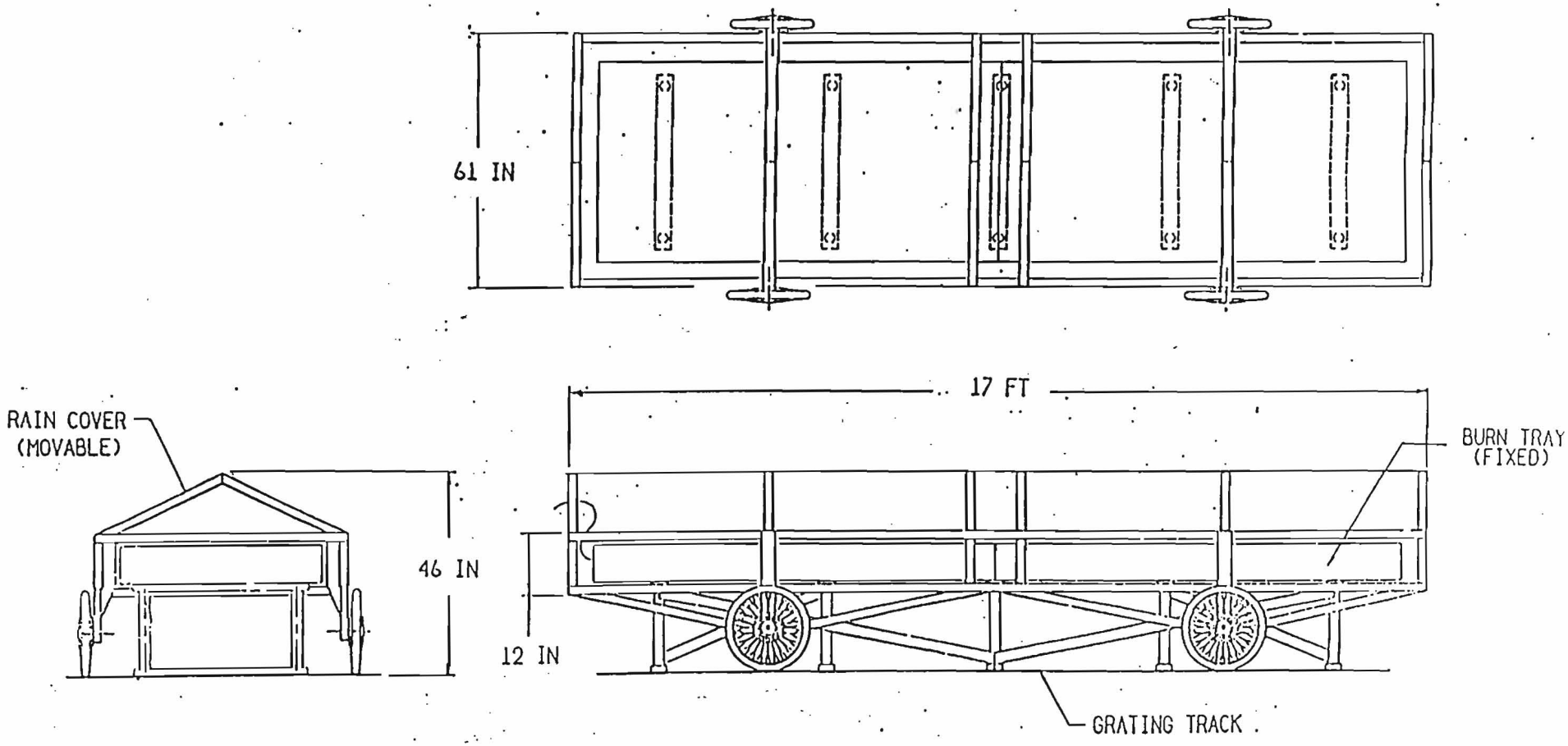

Figure H-6
Technical Area (TA) 16-399 HE Burn Tray

SUPPLEMENT H-1

Supplemental Water Quality Information

INTRODUCTION

This attachment addresses requirements of Title 40 of the Code of Federal Regulations (40 CFR) Part 264, Subpart X—Miscellaneous Units. The requirements of this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units. To specifically address the requirements that deal with potential contaminant migration transport pathways, a model was constructed to simulate a contaminant spill on the flash pad followed by an unusually-heavy rainstorm. Contaminant concentrations were then estimated for the point where runoff mixes with water flowing in the canyon bottom.

BACKGROUND

In order to evaluate potential contamination of surface and groundwater from Flash Pad 387, a number of assumptions were made about the geology and hydrology of the site, contaminants likely to be present, and the climatology of the site. This specific site, as well as surrounding areas in close proximity to Technical Area (TA) 16, has been studied extensively for many years as part of environmental impact statements, environmental surveillance reports, environmental monitoring programs covering ground water and surface water and air quality, and Resource Conservation and Recovery Act (RCRA) and Hazardous and Solid Waste Amendments (HSWA) activities, including closure and post-closure plans. Information providing the basis for the discussion, assumptions, and calculations, is contained in several previously-published documents. To enable the reader to easily follow the discussion, rather than only referring to information from these documents, the information is excerpted in this attachment where used. The following documents were used extensively in preparing this attachment:

- Closure and Post-Closure Plan for Material Disposal Area P, Volume 1 (ERM/Golder, 1993) supplied inputs for site-specific storm water run-on and runoff, soil characteristics, waste characterization, and site hydrology. These inputs entered into the discussions of transport mechanisms and pathways from Flash Pad 387 at TA-16.

- Determination of 100-Year Floodplain Elevations at Los Alamos National Laboratory (McLin, 1992), furnished material used to evaluate storm runoff potential and to estimate canyon stream flows. It was also the source of data for the volume of water needed during a two-year storm event to create runoff from TA-16 at Flash Pad 387.

- Los Alamos Climatology Summary (Los Alamos National Laboratory [LANL], 1991a) supplied general information about precipitation in the Los Alamos area and also near TA-16.

PURPOSE AND SCOPE

40 CFR, Part 264, Subpart X, requires permit applicants to show that they can prevent any releases that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water, surface water, soil, or subsurface environment.

This attachment studies and evaluates these possible waterborne waste transport pathways and their potential for contaminant migration. The attachment lists some of the contaminants of concern and shows their origin and nature. It presents a scenario for possible waterborne migration, based on site geology, hydrology, and meteorology.

The scenario uses assumptions which are extremes: a worst-case spill, a two-year precipitation event, and total contaminant movement (not taking into account adsorption, biodegradation, incomplete dissolution, etc). Results are compared to screening action levels (SAL) which are typically very conservative.

Additional information concerning the geology, hydrology, and meteorology is presented to support the Subpart X requirements and the presentation of the aforementioned scenario.

SITE CONDITIONS

HYDROGEOLOGY

For a detailed discussion of regional and LANL-specific hydrogeology, refer to Section 2.0 of the Part B permit application.

The hydraulic gradient of the main aquifer in the region averages about 60 to 80 ft/mile within the Puye Conglomerate but increases to 80 to 100 ft/mile along the eastern edge of the plateau as the water in the aquifer enters the less permeable sediments of the Santa Fe Group. The rate of movement of water in the upper section of the aquifer varies, depending on the aquifer materials. Aquifer tests indicate the movement ranges from 20 ft/year in the Tesuque Formation to 345 ft/year in the more permeable Puye Conglomerate (Purtymun, 1984). For additional details on the aquifer, refer to Section 2.0 of the Part B permit application.

Flash Pad 387 lies near the western margin of the Pajarito Plateau on a short, narrow mesa occupying both the edge of the mesa and the southern wall of the adjacent canyon, Cañon de Valle. To the north of the flash pad, the ephemeral stream in Cañon de Valle has cut steep canyon walls into the Bandelier Tuff and drains an area to the west. The canyon walls near Flash Pad 387 are over 100 ft high and expose moderately welded tuff undertain by welded tuff. The stream flow in Cañon de Valle results from surface runoff (storm water and snow melt), as well as discharge from a National Pollutant Discharge Elimination System (NPDES)-permitted outfall located upstream of Flash Pad 387. In the vicinity of the flash pad, the canyon has only a thin layer of alluvium of 2 to 7 ft in thickness (Brown et al. 1988) which could contain water from the stream perched on the underlying tuff. This is a common occurrence with water in major stream channels that cross the plateau. However, in Cañon de Valle no such perched water was found in a series of 17 boreholes drilled in the area between the foot of Material Disposal Area P (MDA-P) and the ephemeral stream at the canyon bottom (Brown et al., 1988). Subsequent monitoring of several of these boreholes, which were constructed as monitoring wells, has never shown the presence of groundwater. Cañon de Valle stream water joins a major intermittent stream in Water Canyon approximately two miles to the southeast. Water Canyon, in turn, flows into the Rio Grande approximately six miles to the east in White Rock Canyon.

Some of the hydrologic characteristics of the unsaturated tuff beneath the landfill have been characterized (LANL, 1993e). Many hydrologic characteristics depend on the degree of welding; the denser the welding, the lower the porosity and hydraulic conductivity. The porosity

of moderately welded tuff ranges from 30 to 55% by volume, while that of welded tuff ranges from 15 to 40% by volume. The saturated hydraulic conductivity for moderately welded tuff ranges from 0.1 to 1.7 ft/day (3.53×10^{-5} centimeters per second [cm/s]); the welded tuff ranges from 0.009 to 0.26 ft/day (3.18×10^{-6} to 6.00×10^{-4} cm/s); the welded tuff ranges from 0.009 to 0.26 ft/day (3.18×10^{-6} to 9.17×10^{-5} cm/s). The values for porosity and saturated hydraulic conductivity are consistent with the ranges of porosity (34 to 57%) and saturated hydraulic conductivity (2.25×10^{-5} cm/s to 5.15×10^{-4} cm/s) of tuff cores recovered near Flash Pad 387 and reported by Stephens (1988). However, reported values for volumetric moisture content of tuff are not as consistent; reported values from 1 to 6% (Purtymun, 1984) compared to 18 to 36% (Stephens, 1988).

METEOROLOGY

Precipitation

Normal annual precipitation, which includes rainfall and water-equivalent snowfall, totals nearly 19 inches (in.) (48 cm). Annual precipitation falls off rapidly toward the valley, with the normal White Rock precipitation at 13.5 in. (34 cm). Annual precipitation normally totals more than 25 in. (64 cm) in the adjacent Jemez Mountains. The increasing amount of precipitation toward the mountains is especially noticeable during the summer when thundershowers develop over the mountains. Showers tend to form, or be stronger, over the mountains for much of the year. Also, winter storms associated with upslope winds drop more snow higher on the plateau.

Los Alamos precipitation is characteristic of a semiarid climate in that variations in precipitation from year to year are quite large. For instance, the annual precipitation extremes range from 6.80 to 30.34 in. (17.77 to 77.06 cm) over a 71-year period. The standard deviation over the same period was 4.81 in. (12.22 cm), or 25% of the mean. In 1986, 30.01 in. fell at the North Community site, near the Jemez Mountains (LANL, 1991a). Precipitation information is given in Table 1.

Temperature

Despite Los Alamos' southern location, temperatures are cool at the nearly 7,400-ft (2,255-meters [m]) above sea level (ASL) elevation. Mean temperatures vary with altitude, averaging 5 degrees Fahrenheit (°F) (3 degrees Celsius [°C]) higher in and near the Rio Grande Valley (6,500 ft [1980 m] ASL) and 5°F to 10°F (3°C to 5.5°C) lower in the nearby Jemez Mountains (8,500-10,000 ft [2,600-3,050 m] ASL).

Winter temperatures typically range from 15°F to 25°F (-9°C to -4°C) during the night and from 30°F to 50°F (-1°F to 10°F) during the day. Cold arctic air masses occasionally invade the Los Alamos area from the north and northeast, but often the shallow layer of coldest air is dammed to the east by the Sangre de Cristo Mountains. Occasionally, Los Alamos temperatures drop to 0°F (-18°C) or below.

Summers have moderately warm days and cool nights. Afternoon temperatures are in the 70s and 80s (°F) (21°C to 32°C) and occasionally reach 90°F (32°C), especially in White Rock. The relatively thin air, light winds, clear skies, and dry atmosphere cause nighttime temperatures to drop to the 50s (°F) (10°C to 15°C), even after the warmest day. Table 1 summarizes Los Alamos and White Rock temperatures.

TABLE 1

Monthly mean temperature and precipitation and median precipitation at Los Alamos and White Rock[a]

	Temperature (°F)				Precipitation (in)	
	Maximum	Minimum	Average	Daily Range	Mean	Median
January	39.5 (41.7)	17.4 (14.6)	28.4 (28.1)	22.1 (27.1)	0.86 (0.57)	0.79 (0.67)
February	43.5 (46.5)	21.1 (19.5)	32.3 (33.0)	22.4 (27.0)	0.80 (0.58)	0.66 (0.48)
March	49.6 (54.9)	26.5 (26.4)	38.0 (40.6)	23.1 (28.5)	1.22 (0.87)	1.07 (0.72)
April	58.4 (63.1)	33.3 (33.1)	45.8 (48.1)	25.1 (30.0)	1.01 (0.68)	0.63(0.44)
May	67.6 (72.0)	42.0 (41.3)	54.8 (56.6)	25.6 (30.7)	1.17 (0.97)	1.05 (0.96)
June	77.8 (82.7)	51.1 (50.6)	64.5 (66.7)	26.7 (32.1)	1.36 (1.00)	0.91 (0.82)
July	80.6 (85.6)	55.3 (55.9)	68.0 (70.7)	25.3 (29.7)	3.26 (2.23)	3.36 (2.05)
August	77.5 (82.5)	53.5 (54.0)	65.5 (68.3)	24.0 (28.5)	3.52 (2.37)	3.24 (2.21)
September	71.1 (76.0)	47.2 (46.5)	59.1 (61.2)	23.9 (29.5)	2.12 (1.52)	2.01 (1.55)
October	61.5 (65.5)	37.6 (35.2)	49.6 (50.3)	23.9 (30.3)	1.30 (1.13)	1.05 (0.60)
November	48.9 (52.7)	27.1 (24.6)	38.0 (38.7)	21.8 (28.1)	1.02 (0.77)	0.67 (0.56)
December	40.8 (43.0)	19.4 (16.1)	30.1 (29.6)	21.4 (26.9)	1.08 (0.81)	0.74 (0.59)
Annual	59.7 (63.9)	36.0 (34.8)	47.8 (49.3)	23.8 (29.0)	18.72 (13.5)	19.0 (13.52)

[a] White Rock data are in parentheses.

Current Water, Soil, and Air Quality

Surface water, groundwater, soil, and sediments are routinely sampled at LANL as part of the environmental surveillance activities. Data on the quality of these media are published annually

in the environmental surveillance reports, i.e., Environmental Surveillance at Los Alamos during 1992 (LANL, 1994b).

The supply well closest to TA-16 is PM-2 located in Pajarito Canyon. The total withdrawal rate for 1991 was 171 million gallons (LANL, 1994d).

SITE CHEMICALS AND ACTION LEVELS

SCREENING ACTION LEVELS FOR NONRADIOLOGICAL CONSTITUENTS

SALs have been derived for environmental restoration activities at LANL. The Environmental Restoration (ER) Program at LANL takes its primary direction from U.S. Environmental Protection Agency (EPA) guidance (EPA, 1989). Subsequent guidance, Corrective Action for Solid Waste Management Units (Subpart S) (EPA, 1990c), a proposed regulation under RCRA, presents a methodology for calculating action levels to determine the need for further evaluation of contamination in various environmental media (i.e., groundwater, surface water, air, and soil). The action levels are calculated using chemical-specific toxicity values and default exposure parameters. In order to comply with the HSWA Module for LANL, SALs have been developed that follow the Subpart S methodology for exposure parameter defaults but that incorporate more recent toxicity values available from the EPA's Integrated Risk Information System (IRIS) database (EPA, 1992b) and Health Effects Assessment Summary Tables (HEAST), (EPA, 1992c), which are updated periodically.

SAL derivations are based on assumptions and equations contained in proposed Subpart S. A complete discussion of assumptions and equations is given in Appendix J of LANL's Installation Work Plan (LANL, 1993e).

In deriving SALs for constituents in water, it is assumed that a 70 kilogram (kg) adult ingests water at a rate of 2 liters per day (L/day) over a 70 year exposure duration. These SALs apply to constituents in both groundwater and surface water.

In keeping with Subpart S, when the maximum contaminant level (MCL) value or state groundwater standard is not available, the value calculated using the specified exposure assumptions for water will be used as the SAL. Although not specifically stated, it is consistent with Subpart S to use the same SAL criteria for both groundwater and surface water constituents. For surface water constituents, these criteria may be more stringent than required because New Mexico has not designated surface waters to be evaluated as drinking water sources.

CHEMICALS OF CONCERN

Chemicals of concern for Flash Pad 387 at TA-16 are those that may potentially migrate from the site in quantities above the established SALs. Three examples of these were chosen for the

hypothetical scenario covered in the following section. These chemicals are listed in Table 2 along with some of their chemical and physical properties.

TABLE 2

Chemicals of Concern - Physical Chemical Information[a]

Compound	CAS no.	Solubility in water @ 20°C (mg/L)[b]	Vapor Pressure (mm Hg)[c]	Henry's Law (atm-m³/mol)[d]	Screening Action Levels[g] Soil (mg/kg)[e]	Screening Action Levels[g] Water (µg/L)[f]
Barium Di-nitrate	10022-31-8	8.70E+04[h]			5.60E+03	2.00E+03
Toluene	108-88-3	5.35E+02	2.81E+01	6.37E-03	9.10E+02	1.00E+03
2,4-dinitrotoluene	121-14-2	2.40E+02	5.10E-03	5.09E-06	1.00E+00	5.00E-02

[a] Most data from Superfund Public Health Evaluation Manual EPA/540/1-86/060, OSWER Dir. 9285.4-1, October 1986.
[b] mg/L = milligrams per liter.
[c] mm Hg = millimeters of mercury.
[d] atm-m³/mol = atmospheres-cubic meter per mole.
[e] mg/kg = milligrams per kilogram.
[f] µg/L = micrograms per liter.
[g] Screening Action Levels from the 1993 Installation Work Plan.
[h] Solubility value for Barium di-nitrate from Handbook of Chemistry and Physics, 65th ed.

EVALUATION OF POSSIBLE CONTAMINATION TRANSPORT PATHWAYS

INTRODUCTION

The following scenario is presented as a conservative evaluation of possible contaminant loading and transport to surface and groundwater systems. No data were available from the flash pad site as sampling has not been performed yet. A hypothetical spill is used as the source term for this evaluation.

SURFACE WATER TRANSPORT

A scenario is described below to evaluate potential impacts of the TA-16 Flash Pad 387 to surface waters. The document, *Determination of 100-Year Floodplain Elevations at Los Alamos National Laboratory* (McLin, 1992), shows that the minimum precipitation event that results in overland runoff and flow into Cañon de Valle occurs only during a two-year, six-hour rainfall, or more intense precipitation event. During this event 1.38 in. of precipitation fall at the flash pad (McLin, 1992). This results in a total flow in Cañon de Valle, below Flash Pad 387, of 21,600 cubic feet (ft^3) over a six hour time period (McLin, 1992). This is the volume of water available to dilute contaminant-laden runoff from the mesa top. The contaminants may be dissolved in the precipitation and transported to the canyon bottom.

Routine operations should not result in significant quantities of contaminants available for dissolution by runoff. To evaluate the potential for contaminant movement from Flash Pad 387 a hypothetical scenario is used. This scenario assumes that a chemical spill occurred which contained the three most common materials at the site: barium nitrate [$Ba(NO_3)_2$], toluene, and 2,4-dinitrotoluene (DNT). The constituents remained on the ground in the vicinity of the site and were mobilized during the next precipitation event that results in runoff (i.e., the two-year storm event). In the absence of actual data from the site these compounds were chosen to represent the constituents of concern to illustrate the potential for contamination movement. These constituents were chosen because they are toxic, are significantly mobilized by water, and are commonly present at the site.

Constituents of Hypothetical Spill

One-half kg of $Ba(NO_3)_2$ is spilled. $Ba(NO_3)_2$ is a major compound present in the high explosive (HE) before it is flashed. It is assumed that this is a finely divided solid powder and the entire

quantity is dissolved and mobilized during the precipitation event. Due to the high solubility of $Ba(NO_3)_2$, all of it is assumed to be dissolved and carried to the stream channel in the canyon below the site.

A quantity of toluene is spilled with a pattern of distribution covering 100 square feet (ft^2). Due to its high vapor pressure it is likely that this solvent would evaporate quickly. For purposes of this scenario, all of it is assumed to be available for transport as a dissolved constituent in surface water runoff.

Several pieces of DNT are also present in the spill and remain on the ground. The total surface area of the pieces exposed to precipitation is three in. by three in. resulting in a total exposed surface area of 0.06 ft^2. For the purposes of this calculation it is assumed that there is a sufficient mass of DNT to permit chemical saturation of all the precipitation that falls on these pieces. Any amount of HE in excess of the quantity required for chemical saturation will remain on the soil after the precipitation event.

Concentrations Observed from the Hypothetical Spill

Table 3 presents the concentrations of the constituents of concern in Cañon de Valle during the scenario two-year precipitation event. The values were calculated by assuming that all the precipitation that fell on the constituents instantly reached chemical saturation. This saturated solution then discharges into the stream channel of Cañon de Valle where it is diluted by 21,600 ft^3 of runoff flowing through the canyon. The concentrations shown in the table are the concentrations of the surface water in Cañon de Valle stream channel after mixing with the contaminant-laden runoff flowing down from the mesa top.

TABLE 3

Concentrations Observed in Cañon de Valle Surface Water Resulting from Hypothetical Spill

Constituent of Concern	Hypothetical Area or mass	Solubility in water @ 20°C	Calculated Concentration in drainage	SAL
Barium	0.5 kg	87 g/L[a]	0.8 mg/L	2 mg/L
Toluene	100 ft^2	535 mg/L	0.3 mg/L	1 mg/L
Di-nitrotoluene	0.06 ft^2	240 mg/L	0.08 mg/L	0.05 mg/L

[a] g/L = grams per liter

While the concentrations in the stream channel are close to the SALs, it should be noted that they were determined using the assumption that a 70-kg adult ingests water at a rate of 2 L/day for 70 years. The concentrations in Table 3 were developed for a single precipitation event lasting six hours and occurring, on average, once every two years.

Table 3 presents the results of an unlikely scenario where significant quantities of three toxic materials remain on the ground. Under this scenario the constituents of concern will be close to or below the SALs at the point the runoff from the mesa top enters the Cañon de Valle stream channel. The concentrations listed in Table 3 do not consider further dilution that will occur as the contaminants move downstream and the stream channel collects more runoff. A significant reduction in the concentrations will occur at the confluence with Water Canyon.

The assumptions used for the proceeding calculations are conservative. No allowance was made for degradation (see Table 4), or for sorption to soils or sediments. The calculation assumes that momentary contact with rainwater is sufficient to cause chemical saturation. It should also be noted that no provision for physical mass transport of HE solid particles is considered. The assumption is that the pieces are of sufficient mass that they will not be moved off the flash pad.

While it is anticipated that DNT will only be available for surface or groundwater contamination in the event of an unremediated spill, it is useful to consider its persistence in the environment. Table 4 presents half-lives for 2,4-dinitrotoluene in various environmental media. The half-lives in surface water are on the order of a few tens of hours and indicate that DNT will be

to one percent of the initial concentration. This will occur in one day if the low value is used or ten days if the high value is used.

TABLE 4

2,4-Dinitrotoluene Half-lives

Medium	Half-life	Half-life
Air	72	23
Surface Water	33	3
Groundwater	8640	48
Soil	4320	672

Source: Howard et al., 1991.

The Table 5 shows measured concentrations of barium in Cañon de Valle. These data were collected as part of vadose zone monitoring investigation for the MDA-P landfill (ERM/Golder, 1993). These values are for points upstream from where runoff from the flash pad would enter the stream channel. This report suggests that the NPDES outfall at TA-16, Building 260 is the primary source of the barium observed in the surface waters. The values in Table 5 are one-to-two orders of magnitude higher than the values found in Table 3 which are anticipated for an inadvertent release from Flash Pad 387 operations.

TABLE 5

Barium and Nitrate Concentrations in Water Samples
Canon de Valle Stream Survey

STATION	STATION DESCRIPTION	BARIUM (mg/L)	NITRATE (mg/L)
1	Channel at Highway 4	dry	dry
2	Channel below old pond	35.8	< 0.2
3	Channel above Building 260	9.9	0.8
4	Building 260 NPDES outfall	4.4	0.8
5	Tributary above outfall	dry	dry
6	Tributary below outfall	6.4	7.7
7	Tributary below outfall	38.1	< 0.2
8	Tributary below outfall	39.9	2.5
9	Channel below outfall	10.0	0.8
10	Channel below outfall	12.4	0.7
11	Channel below outfall	9.1	0.8
12	Channel below outfall	8.7	0.6
13	Channel above landfill	9.5	0.6
14	Channel below landfill	9.5	Not available

Source: ERM/Golder, 1993.

GROUNDWATER TRANSPORT

The potential for precipitation to carry contaminants from the mesa tops downward to water-bearing zones is low due to the thickness and extreme dryness of the underlying soils and rock. Most rainwater which falls onto the mesa top will migrate into the upper soil horizon and be stored until it is removed by capillary action and is transpired back into the atmosphere. Volatile contaminants that are dissolved in this water such as toluene, will either be vaporized or degraded. DNT will chemically precipitate in the soil horizon and ultimately be degraded in a matter of months. Barium will precipitate out of the infiltrating waters and build up in the upper

soil horizon. The depth of penetration of the infiltrating waters will depend upon the amounts and duration of rainfall and whether the waters intercept a fracture or fault. The likelihood of migration downward through the rock pores is low.

Information from previous studies (DEIS; ERM/Golder, 1993) suggest that the soil moisture profile for this mesa is very dry and that penetration is shallow. The MDA-P landfill, whose history spans 40 years, contains high levels of barium (i.e., up to 18,000 mg/L in simulated leachate by the extraction procedure [EP] toxicity procedure) and is unlined. However, additional data show that barium has only migrated to a depth of 10 feet below the bottom of the landfill (i.e., with EP toxicity values of 15 mg/l or less). These data suggest that migration downward is minimal and very slow.

No evidence exists to suggest that fractures or faults might affect infiltration at this site. Spring discharges which exist in canyon walls do suggest the presence of water-bearing zones above the main aquifer, but their discharges are into the canyon bottom and therefore contribute to the surface water.

Water will be present in the canyon bottom more frequently than during the two-year precipitation event required for runoff from the mesa top. This will dilute the waters that may contribute to groundwater, resulting in significantly lower concentrations. While the canyon bottom is the most likely pathway to groundwater aquifers, the concentration of contaminants in these waters will be low.

Although this facility is located on a mesa top, the greatest potential for groundwater contamination is through the canyon bottom below the site. Waterborne contaminants are more likely to move into the groundwater system through the canyon bottom due to the more frequent presence of water (LANL, 1993d). The earliest risk of groundwater contamination will be through the canyon bottoms.

CONCLUSION

These preliminary results suggest that the very low SAL for DNT makes it a constituent of potential concern. SALs for all other compounds expected to be present should be evaluated to determine levels of concern.

This straight forward analysis provides a conceptual model for evaluating the potential contribution to surface and groundwaters for contaminants that may be present at Flash Pad 387. Sampling results may suggest that more comprehensive modeling, including the kinetics of dissolution, degradation, sorption to soils, particle transport, bioaccumulation and groundwater contributions, is indicated.

ADDITIONAL REFERENCES

EPA (U.S. Environmental Protection Agency), October 1986, "Superfund Public Health Evaluation Manual," EPA/540/1-86/060, OSWER Directive 9285.4-1, Office of Emergency and Remedial Response, Washington, DC (EPA, 1986).

EPA (U.S. Environmental Protection Agency), May 1989, "Interim Final RCRA Facility Investigation (RFI) Guidance, Volume I of IV, Development of an RFI Work Plan and General Considerations for RCRA Facility Investigations," EPA/530-SW-89-031, OSWER Directive 9502.00-6D, Office of Solid Waste, Washington, DC (EPA, 1989).

EPA (U.S. Environmental Protection Agency), July 27,1990, "Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities," Vol. 55., pp. 30798-30884 (EPA, 1990c).

EPA (U.S. Environmental Protection Agency), October 1,1992, "Integrated Risk Information System (IRIS)," Water Office of Science and Technology: available from National Technical Information Service, Springfield, Virginia (EPA, 1992b).

ERM/Golder, August 1993, "Closure and Post-Closure Plan for Material Disposal Area P (MDA P) Los Alamos National Laboratory, Volume 1 of 2, Draft Revision 0._ (ERM/Golder, 1993).

Howard, Philip H. et al., 1991, Handbook of Environmental Degradation Rates. Printup, Heather Taub. Lewis Publishers (Howard, 1991).

Purtymun, W.D. et al., 1994, Water Supply at Los Alamos during 1991. LA-12770-PR Progress Report (LANL, 1994d).

Weast, Robert C, 1984, CRC Handbook of Chemistry and Physics. CRC Press, Inc., Boca Raton, Florida (Weast, 1984).

NPDES[a] Permit Discharge Standards

Effluent Characteristics	Regulatory Limit Daily Average	Regulatory Limit Daily Maximum
Chemical Oxygen Demand (COD)	125 milligrams per liter (mg/L)	125 mg/L
Total Suspended Solids (TSS)	30 mg/L	30 mg/L
pH	6.0 (min)	9.0 (max)
Oil and Grease	15 mg/L	15 mg/L
Aluminum	5.0 mg/L	5.0 mg/L
Arsenic	0.04 mg/L	0.04 mg/L
Boron	5.0 mg/L	5.0 mg/L
Cadmium	0.2 mg/L	0.2 mg/L
Chromium	5.1 mg/L	5.1 mg/L
Cobalt	1.0 mg/L	1.0 mg/L
Copper	1.6 mg/L	1.6 mg/L
Lead	0.4 mg/L	0.4 mg/L
Mercury	0.01 mg/L	0.05 mg/L
Selenium	0.05 mg/L	0.05 mg/L
Vanadium	0.10 mg/L	0.10 mg/L
Zinc	95.4 mg/L	95.4 mg/L
$^{226}Ra^{b} + {}^{228}Ra$	30.0 picocuries per liter (pCi/L)	30.0 pCi/L
Tritium	3,000,000 pCi/L	3,000,000 pCi/L

[a] NPDES = National Pollutant Discharge Elimination System.
[b] Ra = radium

SUPPLEMENT H-2

The New Mexico Environment Department=s August 17, 1995, Letter to the Department of Energy Los Alamos Area Office Regarding Comments Concerning Groundwater Contamination and Protection at Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

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17 August 1995

Mr. Larry Kirkman
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Los Alamos Area Office
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

RE: Comments Concerning Ground-water Contamination and Protection at Los Alamos National Laboratory(LANL), Los Alamos, New Mexico

Dear Mr. Kirkman:

The New Mexico Environment Department(NMED), Department of Energy Oversight Bureau(DOE OB) and Hazardous and Radioactive Material Bureau(HRMB) staff have assessed LANL's ground-water protection program, and have concluded that several problems concerning ground-water contamination and protection exist. The following summarizes major concerns of the NMED in relation to ground-water protection at LANL:

- From 1989 to 1993, water at approximately 271 ground-water monitoring stations(wells) exceeded Department of Energy, Environmental Protection Agency, New Mexico State drinking water standards or maximum contaminant levels, and NMED Water Quality Control Commission (WQCC) standards.

- Results of historical tritium concentration trend analyses, performed for seven LANL regional aquifer monitoring wells indicate that past laboratory releases of tritium-contaminated water may have commingled with the regional aquifer.

- LANL's Environmental Surveillance group recently reported preliminary data which indicate that the regional aquifer near production well O-4 contains strontium-90 at levels

four(4) times the New Mexico State drinking water standard and NMED WQCC standard.

- Both LANL and NMED DOE OB analytical data obtained from on-site and off-site springs are showing elevated concentrations of chlorinated solvents, high explosives, nitrates/nitrites as nitrogen and radionuclides.

- Preliminary modeling of the water balance in Mortandad Canyon by NMED suggests radionuclide-bearing effluent from LANL's liquid radioactive waste treatment facility(Tech Area 50) can leak out of the shallow(alluvium) aquifer and thus percolate towards the regional aquifer.

The above conditions warrant NMED's previous recommendations to develop a site-wide ground-water monitoring system to ascertain the impacts of laboratory operations to the groundwater regime. Currently, the impact to human health and the environment is unknown. A plan is required to determine adequately the effect past, current, and future laboratory operations have on the ground-water regime. The inadequacy of LANL's current ground-water monitoring system, the lack of basic hydrologic information, and the lack of compliance with both HSWA and RCRA ground-water monitoring requirements have previously been conveyed by NMED through memoranda, presentations, and letters. *(c.f. NMED internal letter, August 26, 1992; NMED letter to Jerry Bellows, November 25, 1992; NMED Initial Ground-Water Assessment Report, December 1992; NMED internal memo, February 5, 1993; NMED presentation at San Ildefonso, February 16, 1993; NMED/LANL meeting February 19, 1993; NMED letter to Diana Webb, March 10, 1993; NMED letter to Diana Webb, July 1, 1993; NMED letter to distribution, August 6, 1993; NMED memo to EPA, August 5, 1993; NMED internal memo, November 23, 1993; NMED letter to Diana Webb, February 28, 1994; NMED internal memo, February 22, 1994; NMED internal presentations, May 13, 1994; NMED letter to Joseph Vozella, July 7, 1994; NMED letter to EPA, January 23, 1995; NMED letter to EPA, January 24, 1995; NMED/DOE meeting, April 13, 1995; NMED letter to Larry Kirkman, May 30, 1995; NMED internal memo, July 5, 1995).*

Basic geology, hydrogeology, and pathways for contaminant transport have not been adequately addressed to date. At present, the following fundamental hydrogeologic issues/questions remain unresolved at LANL.

- Individual zones of saturation beneath LANL have not been adequately delineated, and the "hydraulic interconnection" between these is not understood. A facility-wide description of the hydrogeologic characteristics affecting ground-water flow beneath the facility cannot be made without adequate delineation of the perched-intermediate aquifer(s) beneath LANL.

- The recharge area(s) for the main and perched-intermediate aquifers have not been identified. It is unknown at this time if any significant quantity of water is recharging the main aquifer through fracture-fault zones which occur on the Pajarito Plateau. Characterization of these site-wide fault zones as potential pathways for aqueous migration is not complete. It is unknown what effect, if any, these zones may have on the direction of ground-water flow and hydraulic gradient of the main and perched-intermediate aquifers.

- The ground-water flow direction(s) of the main aquifer and perched-intermediate aquifer(s), as influenced by pumping of production wells are unknown.

- Aquifer characteristics cannot be determined without additional monitoring wells installed within specific intervals of the various aquifers beneath the facility. Locations of wells designed for aquifer testing cannot be addressed adequately without the delineation of individual zones of saturation beneath LANL.

At present, it appears that several different organizations(i.e., Environmental Restoration, Environmental Surveillance and Earth and Environmental Science divisions) at LANL are performing activities related to ground-water protection, monitoring and characterization. NMED does not consider that LANL's individual programs are adequately addressing the necessary requirements for a comprehensive ground-water protection program.

The hydrogeologic projects underway lack the integration necessary to meet the specific requirements of the HSWA permit and to address the fundamental hydrogeologic issues mentioned above. The lack of knowledge surrounding these fundamental hydrogeologic issues does not allow for compliance with the regulatory requirements of a site-wide characterization.

NMED is currently evaluating what work needs to be conducted and to what level of detail to assure compliance with both the HSWA hydrogeologic permit requirements and the requirements for ground-water monitoring of RCRA regulated units. This evaluation should be completed in October, 1995, and provided to EPA and then available to LANL.

During the course of NMED's investigation for the RCRA hydrogeologic evaluation, it has become evident to NMED that a RCRA site-wide hydrogeologic workplan should be developed and submitted to NMED and EPA for review and approval. A site-wide hydrogeologic workplan developed under the driver of RCRA will provide a mechanism to assure a compliance schedule with specific tasks to meet the permit objectives. The workplan should address both the HSWA hydrogeologic permit requirements and RCRA regulatory ground-water monitoring requirements.

Thank you for your attention in this matter. Should you have any questions concerning either technical or regulatory issues please contact Ms. Teri Davis of HRMB at (505) 827-1560. If you have any questions concerning technical matters please contact Mr. Michael Dale of DOE OB at (505) 672-0449.

Sincerely,

Ed Kelley PhD, Director, Water and Waste Management Division
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